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Cultural industry meets tourism: Productive intersectoral spillovers and cluster synergies

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ABSTRACT

Culture and tourism integration is widespread, yet research verifying their productive synergy remains limited. This paper investigates the economic impact of intersectoral and spatial interdependencies within Italy's cultural and tourism industries at the sub-regional level. The analysis introduces a novel definition of cultural-tourism clusters, enabling the modeling of sectoral linkages across areas with varying degrees of cultural and tourism identity and specialization. Results reveal significant intersectoral and spatial spillovers, particularly in areas embedded in mid-tier cultural-tourism clusters. These findings provide valuable insights for regional development and place-based policies, leveraging complementarities across sectors and territories with different economic and cultural vocations.

1. Introduction

From Alfred Marshall's early work on localization economies (1920) to more recent contributions on regional competitive advantage (Porter, 1990; Krugman, 1991), clusters have been recognized as crucial environments for innovation, productivity, and growth, positioning them at the heart of both contemporary economic theory and policy agendas.

Within this field of study, increasing attention has been given to the interplay between industrial clustering, localized learning, and innovation (Chetia et al., 2025; Christopoulos and Wintjes, 2024; Pinch et al., 2003). A substantial body of empirical research suggests that firms located within clusters tend to exhibit greater innovative capacity compared to their more isolated counterparts (e.g. Porter, 1990). The advantages of clusters have been examined particularly in terms of employment growth and competitiveness, often using patenting activity as a key indicator (Delgado et al., 2014), while some potential economic benefits such as gains in productivity have received relatively limited attention (Slaper et al., 2018). However, the analysis of industry and economic system productivity constitutes a fundamental dimension for assessing the economic wealth of territories at international, national, regional, and local levels. Although it doesn't fully reflect societal welfare, since many non-market activities aren't captured by standard metrics like GDP, productivity remains essential and traditional productivity indicators will continue to shape economic comparisons (Martin et al., 2018).

To date, investigations on the role of clustering for economic growth have focused primarily on manufacturing and other "traditional" industries, in line with pioneering milestones of Porter (1990) and Krugman (1991). In less conventional industries, the concept of clustering, spatial agglomeration, the link between the production processes and local cultural contexts, intangible assets, and intersectoral relationships, find a unique and unusual framework of analysis. Then, evaluating the potential productive interdependencies between cultural and tourism industries while accounting for their clustering dynamics has become particularly relevant for shaping place-based policies and territorial development strategies.

The cultural industry stands out for its distinct reliance on localized resources, symbolic capital, historical heritage, and deep social

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embeddedness. It encompasses sectors involved in the creation and circulation of creative content, expressed through tangible goods, such as books, artworks, or crafts, and intangible experiences including live performances, exhibitions, and digital media. Cultural industries often thrive in distinctive environments characterized by a complex interplay of economic, cultural, and institutional factors (Scott, 1999; Power and Scott, 2004). The spatial organization of this industry frequently takes the form of cultural districts or clusters (Scott, 2000; Power and Scott, 2004), which, though they may resemble industrial districts in structure, operate under logics that are inherently tied to the local milieu and creative ecosystem (Maskell and Lorenzen, 2004; Mommaas, 2004).

Cultural districts typically consist of small, highly specialized actors who contribute to various stages of cultural value chains. These firms are often vertically disintegrated but horizontally interconnected, relying heavily on local collaboration and shared creative practices. Moreover, the cultural production process, rich in symbolic meaning, relies on proximity not just for operational efficiency but for the social construction of value (Scott, 2000), where different cultural goods and services often coexist, overlap, and interact within the same production environment. Such diversity has deep implications for how production processes are organized, how value is generated and shared across activities, and how firms and institutions within these industries form interdependent networks. For this reason, co-location remains a defining feature of cultural firms, even in the face of growing digitalization and remote collaboration technologies (Storper and Venables, 2004).

A particularly relevant dimension in the study of cultural districts is their intersection with the tourism industry. Indeed, cultural districts significantly attract tourist flows, renewing their local appeal (Mommaas, 2004). Recognizing that cultural landmarks, attractions, and events are powerful motivators for travel, policymakers have increasingly promoted sustainable tourism development in cultural districts (Santagata, 2002; Bishop and Brand, 2003). However, not only can cultural districts attract tourists generating positive externalities for tourism industries, but tourism itself can also stimulate the productive performance of the cultural industry by boosting revenues, attracting government investment, facilitating access to grants and sponsorships, and expanding promotional opportunities through partnerships and tourist-driven marketing (Jenkins et al., 2011; Seaman, 2020). Therefore, while cultural attractions drive tourism, tourism can foster cultural exchange (Ashworth, 2009), making the two sectors highly interconnected (McKercher and Du Cros, 2002).

Considering this simultaneity is particularly crucial for territories being characterized by different degrees of cultural vocation (cultural hubs as Paris and Rome, as well as inner and remote areas), whose vitality and distinctiveness are shaped not only by internal creative production processes but also by their ability to attract, engage, and adapt to tourist flows, as well as by their interaction with the cultural district to which they belong and their proximity to other districts and cultural or tourism attractors (Cuccia et al., 2016; Figini and Vici, 2012). Indeed, economic agents in an area often leverage complementarities with nearby territories, taking advantage of external services, infrastructure, or demand to compensate for local limitations.

Despite the growing relevance of cultural and tourism industries in regional development (among others, Dellisanti, 2023, 2024; Emili and Galli, 2023; Giuliani, 2007; Mizzau and Montanari, 2008), previous studies largely neglect the intersectoral mutual influence on production outcomes between tourism and culture, mainly considering cultural heritage and supply as input factors for the tourism industry. Moreover, no studies have examined the interconnections among territories characterized by distinct degrees of cultural vocation in terms of inter-sectoral dynamics. Therefore, drawing on potential interdependencies in the production processes of the cultural and tourism sectors, this paper aims to empirically investigate the endogenous productive interdependencies between the two sectors as well as the spatial relationships that shape production spillovers. In particular, we focus on interdependencies at the sub-regional level between both adjacent areas and typologies of cultural-tourism clusters (hereinafter, CTCs), shedding light on the key role of cultural and tourism districts in the production of the two sectors. Specifically, we focus on the following research questions.

RQ1: *How do inter-sectoral spillovers affect the economic performance of cultural and tourism sectors when their production processes are modelled jointly?*
RQ2: *Does the level of specialization and identity of CTCs have an effect on the understanding of production linkages?*
RQ3: *How does the sensitivity to shocks differ across clusters?*
RQ4: *How do different CTCs respond to cluster-specific shocks?*

To do so, we estimate a system of simultaneous spatial dynamic production functions for cultural and tourism sectors in Italian Labor Market Areas (LMAs), areas where most residents work locally, in the period 2013–2022. This level of spatial detail captures functional economic linkages more accurately than administrative units, making LMAs particularly well-suited for analyzing the localized interactions and spillovers typical of CTCs (Lazzeretti and Capone, 2008). To define and classify CTCs, we follow the Italian National Institute of Statistics (ISTAT) classification of LMAs by cultural and tourism geographical concentration and sectoral specialization. This definition of clusters allows us to incorporate both geographic and economic attributes in the analysis of inter- and intra-sectoral productive mechanisms occurring within and between areas belonging to CTCs. Specifically, to account for inter- and intra-cluster effects, we differentiate the analysis of spatial transmission mechanisms of shocks based on the cluster identity of both the originating and receiving areas. This differentiation is particularly relevant because CTCs with different combinations of heritage endowments, cultural production and tourism intensity are likely to play distinct roles as generators, transmitters or recipients of productivity shocks and spillovers, with potentially diverse implications for local divergences in economic growth patterns (Cicerone et al., 2021). We therefore expect both the magnitude and the sign of inter- and intra-sectoral spillovers to vary systematically across cluster types. For instance, highly specialized or iconic destinations may act as exporters of demand and knowledge to surrounding areas, whereas culturally peripheral or structurally weaker LMAs may be less able to absorb or retransmit such effects. This kind of analysis may therefore provide new empirical evidence on the heterogeneous role of CTCs within their territorial context. Results may offer policymakers useful insights for designing place-based strategies tailored to the specific structural conditions, complementarities, and development potentials of different cluster types and their position within broader regional networks.

In summary, our contribution is threefold. First, we evaluate the economic impact of CTCs on cultural and tourism production by jointly modelling the production processes of the two sectors. To do so, we take advantage, for the first time, of the ISTAT classification of CTCs based on the mix of cultural and tourism identities and amenities of territories. Second, we investigate how proximity to areas with varying degrees of cultural and tourism specialization affects sectoral productivity (i.e. inter-cluster spillovers), thereby highlighting the role of spatial context and locational complementarities in shaping industries' local outcomes and distinguishing among the origin and destination of spillovers. This result is achieved through the third contribution of the work, represented by an ad-hoc definition of the spatial weighting matrix. The matrix is constructed as a combination of an economic-based dissimilarity matrix and a pure-physical counterpart.

These contributions offer new insights for regional economic policy, particularly in the design of place-based strategies that leverage cultural and tourism synergies to enhance local resilience, support creative ecosystems, and maximize the benefits of spatial interconnections across labor market areas.

2. Literature

2.1. Cultural and tourism districts for production analysis

Cultural clusters are defined as spatially concentrated agglomerations of cultural firms and institutions, typically dominated by small and medium-sized enterprises (Scott, 2000; Power and Scott, 2004). As traditional industrial districts, these organizations display a high level of specialization and complementarity, functioning within vertically disintegrated value chains while collectively covering the key stages of cultural production. Due to spatial proximity, these districts enable dense networks of formal and informal interactions that promote trust, cooperation, and social embeddedness.

While cultural districts share with traditional industrial districts certain foundational traits, such as spatial concentration, firm interdependence, and the presence of networked relationships, they diverge significantly in their structure, logic of production, and embeddedness. Unlike industrial districts, which typically revolve around standardized, single-product manufacturing processes, cultural districts are characterized by the heterogeneity of their outputs, rooted in symbolic content, aesthetic value, and local cultural identity. Production in cultural districts is less linear and more project-based, often relying on temporary collaborations among highly specialized actors (Faulkner and Anderson, 1987; Maskell and Lorenzen, 2004). Moreover, whereas industrial districts are driven primarily by efficiency and cost-reduction through proximity, cultural districts derive value from creative density, the embeddedness of meaning-making practices, and frequent face-to-face interactions that foster trust, knowledge exchange, and innovation (Granovetter, 1985; Storper and Venables, 2004). Another key difference lies in the social and symbolic embeddedness of cultural production. In cultural districts, the local context is not a neutral container but an active input into the production process: geography, history, and cultural capital directly shape the nature and authenticity of the outputs (Scott, 2000). This specificity provides opportunities for differentiation and competitive advantage in the global cultural economy but also makes the district more fragile and dependent on sustained social cohesion.

However, given that the analysis of cultural districts, particularly in terms of production, cannot be fully disentangled from tourism, the traditional definition of a cultural district requires amplification to adequately account for these interdependencies. Therefore, it becomes essential to consider how clusters are conceptualized in the field of tourism, where the destination itself plays a central and active role in shaping both supply and demand.

Tourism clusters, unlike traditional industrial clusters that focus on homogeneous production systems, are characterized by the diversity of services involved in creating the tourism experience (Hjalager, 2000). These include core services (e.g., accommodation, food, attractions) and peripheral or support services (e.g., education, media, consultancy, infrastructure). Tourist districts differ from industrial ones in that the destination itself plays an active catalytic role, not merely as a physical location but as a "mental space" shaped by the shared perceptions of stakeholders, including visitors, operators, and residents (Jackson and Murphy, 2002). The collective image of the destination becomes a central point of alignment for all local actors, guiding their behavior and strategic choices. In this context, territory is conceptualized not merely as a production site, but as a product in its own right. Unlike industrial districts, where production and consumption are spatially and temporally separate, tourist districts involve a direct overlap of production and consumption in both time and space. Tourists are not passive recipients but active participants in value creation, contributing to the territory's appeal and generating network externalities. Thus, territory becomes the site of the "moment of truth" (Normann, 1985), central to the marketing mix of the destination.

Besides relying on their internal resources, both cultural and tourism districts are characterized by strong connections with the surrounding socio-economic context. Indeed, clusters tend to emerge as open systems that rely on knowledge, competencies and capital originating outside the cluster (Vang and Chaminade, 2007; Giuliani et al., 2005; Pietrobelli and Rabellotti, 2006). Cultural districts stimulate local labor markets, attract external investment, draw tourism, appeal to creative talents, and can play a significant role in the regeneration of post-industrial urban areas (Florida, 2002; Mommaas, 2004). This continuous inflow of new individuals and ideas contributes to the district's innovation capacity and protects against stagnation. Similarly, the evolution of tourism clusters depends on external pressures such as regulatory frameworks that affect land use and mobility, the availability of infrastructure and digital connectivity, the capacity of local actors to respond to crises or disruptions (e.g., pandemics or geopolitical instability), and the vitality of local cultural production, including arts, heritage, and creative industries, which contribute to the distinctiveness and symbolic capital of the destination.

While cultural and tourism clusters share several theoretical foundations, the distinction between them often remains blurred. The main differences consist in their production logic, output, and the role assigned to territory. Cultural clusters revolve around the generation, preservation, and dissemination of cultural content. In these clusters, the territory functions mainly as a repository of cultural resources and identity, providing historical, artistic, and symbolic assets that can be mobilized for cultural production. Tourism clusters, by contrast, are oriented toward the co-production of an integrated visitor experience and require the coordination of a broad set of service providers. In these clusters, the territory becomes part of the product itself as visitors and providers co-create the tourism experience on site.

Although the cultural and tourism economics literatures have extensively defined and analyzed their respective clusters, a notable gap remains in the conceptualization and investigation of CTCs. Treating the two phenomena in isolation is analytically limiting, as cultural and tourism activities are intrinsically intertwined and their performances shaped by reciprocal and cumulative interactions. Since cultural assets and production enhance the distinctiveness and attractiveness of destinations, stimulating tourism demand, while tourism increases the visibility, financial sustainability, and market reach of cultural activities, focusing on only one side risks overlooking key dynamics. Considering them together allows us to capture the integrated territorial processes through which cultural value, visitor experiences, and local development co-evolve.

Therefore, in this work, we define CTCs, understood as territories in which a specific and synergistic combination of cultural and tourism activities comes together to generate an integrated, place-based product, and examine their role in the productive performance of the two industries at the local level by analyzing the interdependencies between the two constituent sectors, i.e. cultural and tourism, as mutually reinforcing components of a unified territorial system.

2.2. Production and spatial analysis of cultural and tourism industries

As pointed out by Long and Morpeth (2016) "*relationships between tourism and creative industry sectors are to varying extents explicit, complementary, synergistic and mutually constitutive but in some contexts they may be unacknowledged or competitive, in tension and contested. This duality and complexity offers rich territory for critical research that goes beyond advocacy for the creative industries and 'creative tourism'* ". These dependencies occur through a wide spectrum of features, including tangible elements like national and world heritage sites, monuments, historical landmarks, and cultural routes, as well as intangible aspects such as traditional crafts, gastronomy, festivals, music, oral traditions, and religious/spiritual tourism.

The link between cultural resources and their specific tourism demands is evident (Herrero-Prieto and Gomez-Vega, 2017) and has been examined from various perspectives: on the demand side, focusing for example on the unique characteristics and motivations of cultural

tourists (Kim et al., 2007; McKercher and Du Cros, 2002; De Guzman et al., 2006); on the supply side, e.g. investigating participation in diverse tourist experiences (Richards, 1996) or measuring the contribution of cultural tourism and events to economic growth (Murrillo et al., 2008; Stoddard et al., 2006; Herrero et al., 2006; Cerisola and Panzera, 2024); from a policy perspective, valuing the impact of public spending interventions toward cultural heritage preservation or the development of cultural policies (Cellini and Torrisi, 2013; Wöber and Fesenmaier, 2004).

In the productivity analysis framework, the majority of research conducted on cultural industries' performances and productivity revolves around assessing the efficiency of specific entities representative of the cultural industry (firms or aggregates of firms) in a territory. Some examples are Zieba (2016), Last and Wetzel (2010), and Marco Serrano (2006) for theatres in central Europe; Bishop and Brand (2003) for a selection of museums in the United Kingdom, Mairesse and Vanden Eeckaut (2002), Pignataro (2002), and Basso and Funari (2004) on Italian museums, and Del Barrio and Herrero (2014) for Spanish museums. Similar studies have been conducted also for orchestras, (Luksetich and Nold Hughes, 1997), music composers (Borowiecki, 2013), and cultural institutions such as libraries (De Witte and Geys, 2011; Vitaliano, 1998) and historical heritage restoration agencies (Finocchiaro Castro et al., 2011; Guccio et al., 2014).

When cultural industries are located in geographic proximity, they may engage in various forms of interaction, ranging from informal collaborations to structured partnerships, that facilitate processes of complementarity, hybridization, and co-creation (Potts et al., 2008; Scott, 2000). Some recent studies analyze how the cultural sector's performance is affected by networking, clustering, and spatial aggregation phenomena (Fernandez-Blanco et al., 2013; Herrero-Prieto and del Barrio-Tellado, 2020; Del Barrio-Tellado et al., 2023; Bernini and Galli, 2023b). However, these studies typically analyze the performance of these networks of institutions (belonging to the same kind of firms) as primary subjects, without considering possible synergies with the production processes of other industries, such as tourism.

On the other hand, in the field of tourism, there is a vast and growing body of literature on productivity studies within the tourism and hospitality sectors (among others, Fuentes, 2011; Cuccia et al., 2016; Cracolici and Nijkamp, 2008; Dwyer et al., 2003). In this literature, however, cultural industries and heritage are considered as the portion of the tourism industry's output that relates to culture (e.g., cultural tourists identified by their motivation) or as the combination of tourism and cultural industries' performance (e.g., investments in cultural heritage that support the cultural industry but also impact tourism flows).

Similarly to the case of cultural industries, recent research in the field of tourism has increasingly acknowledged the relevance of spatial phenomena in explaining the productivity dynamics of tourism destinations. As highlighted by Marrocu and Paci (2013), tourism destinations often benefit from spatial interactions with neighbors, which can foster mutual dependence and increase the overall attractiveness of the region. A growing body of empirical work has incorporated spatial dynamics in productivity analyses (Yang, 2016; Kim et al., 2021; Emili and Galli, 2023; Bernini and Galli, 2023a), recognizing their central role in capturing the complex interdependencies that shape tourism supply systems and influence regional development processes. However, these studies typically treat the tourism sector in isolation and tend to consider culture as a travel motivation.

In sum, several studies in the tourism and cultural economics framework concentrated on the productivity analysis of the cultural sector and those of tourism-related industries. However, to our knowledge, none of these studies explicitly considers possible simultaneous interdependences among the production processes of the two industries, moving beyond the traditional view of cultural heritage and products merely as input factors of tourism production, or as a delimiting factor characterizing a specific segment of tourism. Moreover, no studies investigate possible inter-sectoral spatial spillovers among these two sectors. Therefore, in this work, we examine the inter-sectoral and spatial relationships among the production processes of the cultural and tourism sectors in the framework of CTCs. A further contribution of our study lies in accounting for possible interdependencies across neighboring territories with different identities and vocations. Recognizing the relational nature of clustering, where districts evolve not in isolation but through continuous interaction with surrounding contexts, is essential for the design of more effective cultural-tourism policies. It underscores the need to move beyond rigid spatial boundaries or singular branding strategies, and to adopt instead a networked development logic grounded in permeability, complementarity, and shared cultural-touristic ecosystems.

3. Cultural-tourism cluster

The purpose of defining CTCs is to identify areas where cultural and tourism-related economic activities and social interactions naturally concentrate, offering a more accurate representation of the lived experience of the population than formal administrative boundaries. The cultural and touristic vocation of these areas can be defined by the presence of tangible resources or activities that embody a high level of intangible value, particularly symbolic elements of aesthetic, artistic, historical, or identity-based significance. This vocation is further reinforced by the orientation of local economies toward sectors that are functionally and culturally aligned with this identity, whether expressed through traditional practices or, conversely, through creative and innovative reinterpretations.

To assess the extent and consistency of the resources that define CTCs, we use the Italian National Institute of Statistics' classification of Italian LMAs, focusing on the cultural and touristic vocation of territories (ISTAT, 2015). ISTAT considered a set of indicators related to cultural resources and tourism offer, which should contribute to the attractiveness and competitiveness of local systems, differentiating between two pillars: cultural and landscape heritage, and the productive-cultural fabric. The first dimension refers to the physical presence of places, material assets, structures, institutions, and other resources of specific historical, artistic, architectural, and environmental value and tourist interest. The second dimension concerns the set of activities related to cultural and tourism production, distribution, and education. For both aspects of analysis, ISTAT used a set of selected indicators (see Table A1 in Appendix for a complete list of the indicators along with some descriptive statistics), enabling the classification of local systems according to their relative endowment of cultural and tourism assets. Based on the distribution of the composite indicators developed for each dimension—namely, cultural heritage and the cultural/creative production fabric—five main groups of local systems that are homogeneous with respect to these dimensions can be identified: (i) *The Great Beauty*: high values for both cultural heritage and productive cultural tourism fabric; (ii) *Heritage Potential*: high cultural heritage and tourism capacity in terms of accommodation and employment, but with limited cultural production; (iii) *Cultural Entrepreneurship*: strong in cultural and tourism production but with limited heritage and hospitality assets; (iv) *The Engine of Tourism*: low scores in both dimensions but with notable tourism appeal; (v) *Cultural Peripherality*: areas with significantly lower cultural resources and productive assets. These typologies of clusters can therefore be considered as the different territorial modes or expressions of CTCs.

In this paper, we adopt the ISTAT classification of LMAs based on their cultural and tourism vocation to define CTCs. This approach enables the identification of homogeneous areas in terms of cultural and

tourism offerings and more heterogeneous or disadvantaged areas, which may suffer from limited accessibility, lower attractiveness, or insufficient services relative to their neighbors. On one hand, geographical proximity with differently specialized areas may support shared services and coordination, offering a richer and more diverse experience. On the other hand, if neighboring areas are too different, they may struggle to interact effectively. For this reason, it is important to empirically investigate the relationships between different CTCs, in order to understand when complementarities lead to cooperation and when they risk becoming barriers. As extensively discussed below, we integrate the ISTAT classification of LMA based on their cultural vocation directly into the spatial weighting matrix used to model interdependencies across LMAs. This allows us to model spillover transmission not only across geographically proximate LMAs, but also across territories that are similar or dissimilar in their cultural–tourism vocation. This approach enables to capture how cluster-specific identities condition the direction, magnitude, and relevance of inter- and intra-sectoral spillovers, thereby linking spatial dynamics more explicitly to the territorial structure of cultural–tourism specialization.

To operatively consider the differences between these clusters, we compute dissimilarity measures among cluster typologies as Euclidean distances based on the set of cultural and landscape heritage features and productive-cultural fabric attributes (after standardization) used by ISTAT. The resulting distances shown in Table 1 indicate that the most similar areas in terms of cultural vocation are *The Engine of Tourism* and *Cultural Peripherality*, as both are characterized by very low levels of cultural and landscape heritage, as well as limited cultural production. However, *The Engine of Tourism* also shows similarity to *Heritage Potential*, since both attract a large number of tourists and share a low level of cultural productive endowment. As expected, the greatest distance is observed between *The Great Beauty* areas and *Cultural Peripherality*, as they exhibit opposite patterns across both dimensions.

In what follows, we first introduce a general specification of the production functions for the cultural and tourism industries at the LMA level. We then examine how differences between clusters influence production outcomes, highlighting the potential effects of both belonging to a specific cluster and being located near similar or markedly different clusters on industry performance.

Table 1
Distances among cultural and tourism (standardized) attributes.

	The Great Beauty	*Heritage Potential*	*Cultural Entrepr.*	*The Engine of Tourism*	*Cultural Periph.*
The Great Beauty	0	-	-	-	-
Heritage Potential	8.456	0	-	-	-
Cultural Entrepr.	5.899	8.143	0	-	-
The Engine of Tourism	7.841	4.151	6.043	0	-
Cultural Periph.	9.211	5.984	7.786	3.299	0

4. Methodology

4.1. Model specification

In this work, following Emili and Galli (2023), we consider a system of Cobb-Douglas functions to investigate the multi-output and multi-input nature of the cultural and tourism industries, with standard input factors given by labor and capital, but also temporal and spatial dynamics (Yang, 2016; Kim et al., 2021). The Cobb-Douglas production function is a general and flexible instrument for analysing the production processes of a firm, sector, or industry. Developed in the early '80s by Cobb and Douglas and subsequently refined by numerous researchers, this tool has found widespread application in various frameworks, primarily due to its simplicity and flexibility (Reynès, 2019). In line with the objectives and challenges of this study, these characteristics ensure an appropriate level of parsimony in the estimation of the empirical model. The system of simultaneous spatial panel data models is defined by:

$$\begin{cases} ln\ Y_{C,it} = \gamma_T\ ln\ Y_{T,it} + \sum_{s=C,T}\sum_{j\neq i}\psi_{C,s}w_{ij}^{C,s}\ ln\ Y_{s,jt} + \sum_{s=C,T}\alpha_{C,s}\ ln\ Y_{s,it-1} + \sum_{s=C,T}\sum_{j\neq i}\phi_{C,s}w_{ij}^{C,s}\ ln\ Y_{s,jt-1} + \boldsymbol{\beta_C}\ \boldsymbol{ln\ X_i} + \delta_{C,i} + \zeta_{C,t} + \varepsilon_{C,it} \\ ln\ Y_{T,it} = \gamma_C\ ln\ Y_{C,it} + \sum_{s=C,T}\sum_{j\neq i}\psi_{T,s}w_{ij}^{T,s}\ ln\ Y_{s,jt} + \sum_{s=C,T}\alpha_{T,s}\ ln\ Y_{s,it-1} + \sum_{s=C,T}\sum_{j\neq i}\phi_{T,s}w_{ij}^{T,s}\ ln\ Y_{s,jt-1} + \boldsymbol{\beta_T}\ \boldsymbol{ln\ X_i} + \delta_{T,i} + \zeta_{T,t} + \varepsilon_{T,it} \end{cases} \quad (1)$$

where $lnY_{s,it}$ represents the logarithm of the value added at time t of area $i = 1,\ldots,n$, in industry s with $s = \{Cultural, Tourism\}$. Labor and capital inputs are defined as the logarithm of the number of employees (lnL_{st}) and fixed assets (lnK_{st}) respectively, collected in $\boldsymbol{lnX}$. Simultaneous effects across the value added of the two industries are captured through the $\boldsymbol{\gamma}$ parameters, aiming at capturing the effect of a change in the value added of a given industry on the productive performance of the other interrelated industry in the same period. The specification includes temporal effects, referring to the fact that the performance of each industry at time t is supposed to be affected by the level of output in the previous time period both in the same and other industry (α). Spatial effects at time t and $t-1$ are respectively captured by the terms $\psi_{\cdot,s}w_{ij}^{\cdot,s}$ and $\phi_{\cdot,s}w_{ij}^{\cdot,s}$, with $\cdot = \{C,T\}$. These terms allow to consider how the output of a given sector is influenced by the level of output of the same and other industry in neighboring areas in the same and previous period. In this study, spatial weights are constructed to reflect not only geographical proximity but also the cultural and tourism vocation of LMAs, ultimately identifying CTCs. The definition and underlying rationale of the spatial weight matrix are discussed in detail in the following subsection. This specification is then completed by the inclusion of possible time and individual fixed effects δ and ζ, and the specific-industry error component $\varepsilon_s \sim iid(0, \sigma_s^2)$, led to covariates by means of a certain covariance parameter $\sigma_{C,T}$.

The model in Eq. (1), as highlighted by the following decomposition, allows distinguishing between intra- and inter-sectoral spatial spillovers (the same holds for the spatio-temporal lag).

$$\sum_{s=C,T}\sum_{j\neq i}\psi_{\cdot,s}w_{ij}^{\cdot,s}\ ln\ Y_{s,jt} = \sum_{j\neq i}\psi_{\cdot,C}w_{ij}^{\cdot,C}\ ln\ Y_{C,jt} + \sum_{j\neq i}\psi_{\cdot,T}w_{ij}^{\cdot,T}\ ln\ Y_{T,jt} \quad (2)$$

In particular, in the first equation of the system, $\psi_{C,C}$ captures intra-sectoral spatial effects at time t (from cultural to cultural), while $\psi_{C,T}$ captures inter-sectoral spatial effects (from tourism to cultural). In contrast, in the second equation, $\psi_{T,C}$ captures inter-sectoral effects (from cultural to tourism), and $\psi_{T,T}$ reflects intra-sectoral effects within

the tourism sector. As extensively described in the following subsection, we adopt different definitions for the spatial weights w_{ij}^{C} and w_{ij}^{T} depending on whether they capture intra-sectoral or inter-sectoral spillovers. This choice is primarily motivated by the need to account for the substantial differences between horizontal and vertical linkages that characterize the production functions of the two industries.

In the specified model, identification issues can source from the presence of spatial autoregressive terms ψ and the simultaneity implied by the γ parameters in Eq. (1). While in the first case, model identification is classically achieved if parameters can be deducted from knowledge of their reduced form counterpart (Yang and Lee, 2019), the econometric literature on structural analysis provide several solution for identification issues sourced by the simultaneous equations structure and vector autoregressive analysis, including, among others, zero restrictions, signs restrictions and breaks in volatility (Johansen, 1995; Amisano and Giannini, 1997; Kilian and Lütkepohl, 2017). Recently, Elhorst and Emili (2022), in their analysis of Okun's Law for Dutch regions, considered the use of a complex spatial structure to achieve identification in a system of dynamic spatial equation models, where cross-variable spatial spillovers are modelled through a spatial weighting matrix that differs from the one used for own-variable spatial effects. Thus, as widely discussed in the following section, we consider different weights to model intra-sectoral and inter-sectoral spillover effects. This solution, in line with Elhorst and Emili (2022), can be clearly motivated by the different behavior in spillover effects implied by horizontal and vertical linkages in the three sectors.

The model is estimated by means of an instrumental variable approach in order to guarantee consistency given the small number of time periods available. Specifically, once individual effects are removed by Helmert transformation, we apply a three stage least square estimator, with instruments given by $Q_t = [Y_{t-1}, WY_{t-1}, W^2Y_{t-1}, \widetilde{X}_t, W\widetilde{X}_t, W^2\widetilde{X}_t]$. Instrument selection follows the established literature on dynamic spatial panel data models with simultaneity, in particular Kelejian and Prucha (1998) and Yang and Lee (2019). The instruments are constructed from predetermined and strictly exogenous variables, along with their spatial and higher-order spatial lags, which serve as approximations to the conditional expectations of the endogenous regressors implied by the reduced form of the model. While the choice of this instrument set in the presence of spatial dependence and simultaneity is formally established in the aforementioned studies and related literature, instrument validity is further assessed using a supplementary diagnostic exercise. In particular, we regress the first-stage residuals on the full set of instruments for each equation. While this procedure does not represent a formal test of instrument exogeneity, the results show that the instruments are neither individually nor jointly statistically significant in explaining the residual variation, providing further reassurance that the instrument set does not capture systematic components unrelated to the reduced-form predictions.

Once the model is estimated, marginal impacts have to be computed separately following Elhorst et al. (2021) as the first derivatives of the dependent variable with respect to inputs, i.e. $\frac{\partial lnY}{\partial X} = ME_{\Delta X}, X = \{lnL, lnK\}$. Direct and indirect effects are obtained averaging elements on the main diagonal and on the off-diagonal blocks of $ME_{\Delta X}$ respectively. Given the dynamic nature of the model and its system-wise structure, the resulting impacts provide information on both intra-sectoral and inter-sectoral effects occurring in the short-run and in a longer time horizon.

To empirically specify Eq. (1), as discussed before, we consider core cultural firms following the classification proposed by The Measuring CCS Consortium (2022) and two highly representative sectors for tourism: accommodations and restaurants, ending up with a three-equation system of simultaneous dynamic spatial Cobb-Douglas production functions.

4.2. Definition of cultural and tourism sectors

A substantial body of literature has proposed different ways of classifying cultural and creative industries (CCI), reflecting diverse understandings of creativity and cultural production (see Cerisola, 2019 for a comprehensive review).[1] To define the cultural industry, we follow the proposal of The Measuring CCS Consortium (2022).

This classification provides a systematic and conceptually coherent framework for delineating cultural and creative sectors, addressing the fragmentation that characterised earlier national and European classifications. As highlighted in the report, although debates on the precise boundaries between groups of CCIs will inevitably persist, this classification of firms in core cultural group, cultural industries, and creative services, aligns closely with the structure of the NACE system and remains compatible with the operational needs of national statistical services. It represents the most recent and officially endorsed framework used by the European Union to quantify cultural and creative industries, ensuring cross-country comparability and alignment with international statistical standards. Moreover, it fits the information available in major data sources such as the EU-LFS, SBS, and National Accounts within Eurostat, making it both empirically robust and practically implementable. In contrast to earlier classifications, it captures emerging digital and hybrid activities more effectively, offering a more accurate and up-to-date representation of contemporary cultural and creative ecosystems.

The following analysis focuses on the group of core cultural industries (see the report for the detailed classification of ATECO codes), including cultural education, heritage and memory institutions, museums, libraries and archives, and the visual and performing arts. These activities have traditionally been central to cultural policy in continental Europe and are strongly territorially embedded. Owing to their place-based nature, core cultural industries generate cultural experiences closely tied to local heritage and institutions and play a key role in shaping tourism flows, affecting both their scale and qualitative composition.

For tourism, we follow the standard classification, separately considering the accommodation sector (ATECO 55) and the restaurant sector (ATECO 56). According to Tourism Satellite Accounts (ISTAT, 2017), accommodation and restaurant services account for 79.99% of characteristic tourism products for inbound tourism, 63.54% for domestic tourism, and 75.26% for other components, corresponding to an overall share of 72.19% of total domestic tourism consumption. These two services also represent 50.17% of total domestic tourism consumption when considering all products.

Consistent with previous studies, food and beverage services together with accommodation represent the core of tourism-related industries (Emili and Galli, 2023; Figini and Patuelli, 2021). Other sectors, such as transportation, travel agencies, entertainment, and cultural services, are commonly included in the broader tourism value chain. In our study, however, while we consider the cultural sector as a distinct sector, we exclude travel agencies, transportation, and entertainment services. Travel agency activities largely operate as intermediaries and

[1] Early policy-driven frameworks such as the UK-DCMS (1998; 2001) define CCIs as sectors grounded in individual creativity and the exploitation of intellectual property, while the WIPO (2003) "copyright model" adopts a legal-institutional perspective centred on the role of copyright in production and distribution. Cunningham (2002) conceptualises CCIs as an innovation ecosystem linking cultural production, media industries, creative services and digital content; UNCTAD (2004; 2010) groups symbolic and IP-intensive activities into heritage, arts, media and functional creations along the value chain; and the KEA (2006) "concentric circles" model classifies industries by the relative intensity of cultural content in their outputs. Finally, O'Connor (2010) frames CCIs within a broader creative economy, distinguishing industries along a continuum.

are only weakly tied to the location of tourism production, making them difficult to assign meaningfully to local labor market areas (LMAs). Transportation services, although essential to tourism, are characterized by complex supply structures and production locations that often do not coincide with the place of tourist consumption, particularly at the local scale. Although sports, amusement, and recreational activities are often associated with the tourism value chain, at the local level they can assume highly differentiated meaning depending on the type of event, its scale and its territorial relevance, often positioning them at the intersection between tourism and cultural activities (Richards, 2007). As a results, their coherent inclusion within a regional analysis for tourism and cultural industries is challenging and maybe potentially misleading, particularly at the local scale. Moreover, evidence from Tourism Satellite Accounts suggests that sports and recreational services account for a relatively small share of characteristic tourism production (5.25% for inbound tourism and 3.17% for domestic tourism), further limiting their quantitative relevance for the scope of the present study. These considerations motivate their exclusion from the empirical analysis. Therefore, focusing on three sectors (accommodation, restaurants, and culture) allows us to capture the core locally embedded components of tourism demand while maintaining a parsimonious and tractable framework for joint estimation.

In terms of interpretation, these choices should be understood as capturing the core local production linkages between the tourism and culture sectors, rather than the entire tourism value chain. Consequently, the results should be interpreted as reflecting the spatial and production dynamics of tourism and cultural activities with a strong territorial basis, which are central to local economic development and policy design.

4.3. Spatial structure

In this study, the specification of the transmission channels characterizing the system is made by considering intra-sectoral and inter-sectoral relationships as two distinct phenomena with different mechanisms of transmission. The idea is economically motivated, in line with the principle that vertical and horizontal linkages in value chains are substantially different and require understanding distinct phenomena, such as Input-Output relationships, technological transfers, and agglomeration. Moreover, using two different weighting structures helps overcome potential identification issues that usually arise in simultaneous equations and systems, where results are often supported by zero restrictions in the set of free parameters (see Yang and Lee, 2019; Elhorst and Emili, 2022).

In defining the two different spatial weights in charge of intra- and inter-sectoral spillovers, we use both geographical and economic distance-based criteria (Corrado and Fingleton, 2012; Caragliu and Nijkamp, 2016). This approach enables to investigate the productive linkages among neighboring LMAs with similar cultural and tourism vocations.

On the geographical side, we consider the distance among LMAs centroids and a first order binary contiguity criteria respectively for intra- and inter-sectoral spillovers. As noted by Malerba et al. (2014), spatial interconnectedness is more likely to occur among neighboring areas within the same sector than between different sectors. For this reason, we adopt a truncated inverse distance matrix for intra-sectoral spillovers, allowing for a broader set of neighboring relationships that decrease in influence with increasing distance. In contrast, we use a first-order contiguity matrix for inter-sectoral spillovers, which captures only the most immediate spatial relationships between LMAs sharing a common border. The choice of a first order matrix is preferred to higher order matrices to avoid redundancy in the model specification and to preserve flexibility and parsimony of the estimates.

Table 2
Descriptive statistics across cultural-tourism clusters for output, labor and capital in the three sectors.

		Overall	GB	HP	CE	ET	CP
Cult.	*lnY*	2.83	5.52	1.61	3.99	2.41	1.25
	lnL	1.26	2.96	0.60	1.84	0.97	0.45
	lnK	2.47	5.09	1.26	3.56	2.12	0.95
Accomm.	*lnY*	6.79	8.53	6.12	8.17	6.35	4.74
	lnL	3.72	5.07	3.25	4.69	3.33	2.35
	lnK	8.46	10.42	7.94	9.85	7.87	6.25
Rest.	*lnY*	7.22	8.94	6.24	8.37	6.98	5.65
	lnL	4.46	6.01	3.64	5.40	4.23	3.18
	lnK	7.43	8.89	6.47	8.50	7.29	6.02
n		601	70	134	138	191	67

Note: GB = great beauty; HP = heritage potential; CE = cultural entrepreneurship; ET = engine of tourism; CP = cultural periphery.

On the economic side (Corrado and Fingleton, 2012; Caragliu and Nijkamp, 2016), the idea is that, the production level of a certain LMA will be more significantly impacted by the production processes of LMAs with a similar cultural context and tourism supply (i.e. belonging to the same or similar CTC) than by those with a very different structure. While some production complementarities and borrowing effects may exist across dissimilar areas, the majority of spillovers are expected to occur within CTCs where the concentration of attractions and services enhances tourist mobility and fosters shared development opportunities. Conversely, more heterogeneous or disadvantaged areas—characterized by limited accessibility, lower attractiveness, or inadequate service provision compared to neighboring LMAs—are less likely to benefit from spatial spillovers and may face greater challenges in leveraging production dynamics for development.

Then, the previously mentioned geographic matrices are combined with economic weights accounting for dissimilarities among cluster typologies. Dissimilarities are calculated as the Euclidean distance among the attributes used in the definition of the five classes of CTCs (as described in Section 3).

The final spatial weights for the matrix in charge of intra-sectoral spillovers are given by the product between the inverse Euclidean distance matrix based on the ISTAT classification ($W_{cluster}$) and a geographical inverse distance matrix truncated at 80 km (W_{id}), henceforth identified as $W_{cluster} \times W_{id}$. The choice of an 80 km radius is motivated by the average intra-regional distance between LMAs (75 km). For inter-sectoral spillovers, we consider as weights the product between $W_{cluster}$ and a first order binary contiguity matrix (W_1), henceforth represented as $W_{cluster} \times W_1$. Note that, for areas with the same cultural vocation (i.e. belonging to the same typology of CTC), we only consider spatial proximity, and thus, spillover effects are modelled solely based on geographic criteria.

In the following sections and in Appendix C, we discuss and confirm the appropriateness of this combination of matrices by empirical likelihood comparisons of models with alternative spatial structures.

5. Data

In this work, we use aggregated data at sub-regional level for the Italian tourism and cultural industries in the period 2013-2022. To examine the integration of various sectors in CTCs, this study adopts labor market areas (LMAs) as the spatial unit of analysis.

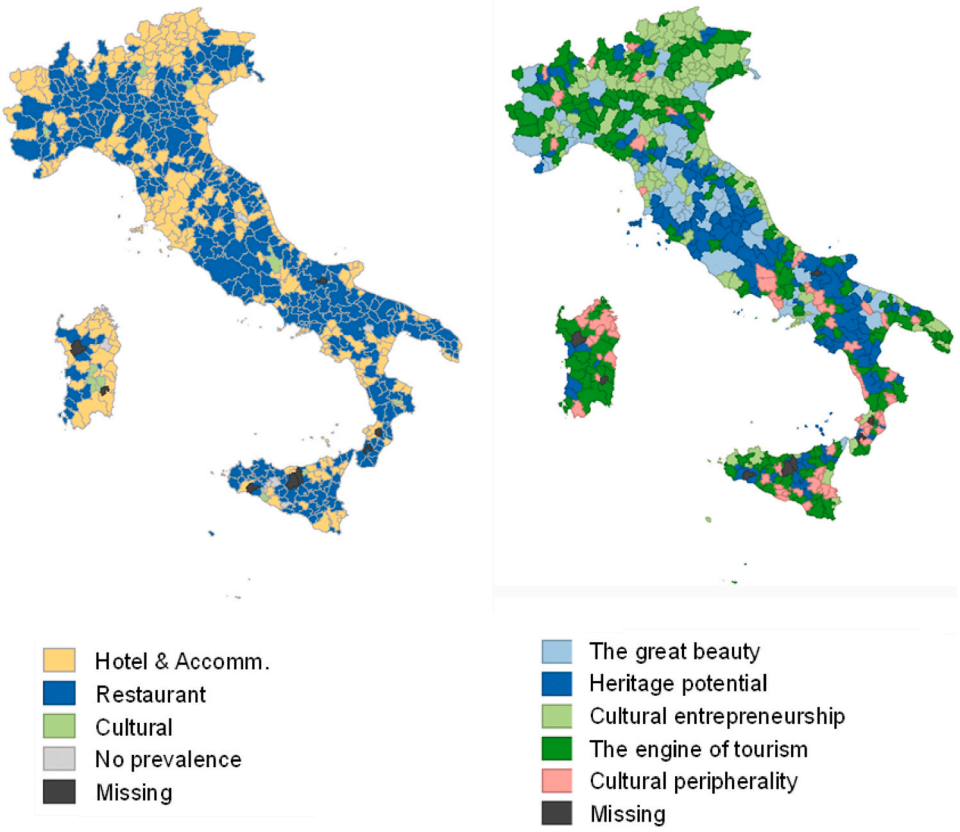

Fig. 1. Prevalent sector in terms of value added based on AIDA data on the left, LMAs cultural classification by ISTAT on the right.

Geo-referenced data at the firm level on the consolidated accounts of Italian companies for the three sectors were collected from the AIDA-Bureau Van Dijk database.[2] Although AIDA provides geographical coordinates for firms' legal headquarters, information on the operating site is only available at the municipal level. Therefore, we used municipal-level data on operating sites and subsequently aggregated (sum) them to the LMA level. Due to missing values in some areas, we ended up with information on 594 LMAs over 10 years for the three sectors.

Table 2 summarizes the mean values (over time and across LMAs) in logarithms for value added (*lnY*), employees (*lnL*), and fixed assets (*lnK*) as proxies of output, labor, and capital respectively, distinguishing between the entire Italian territory (first column), and among areas with different cultural and tourism vocations (ISTAT, 2015). For the overall territory, the restaurant sector generates the highest average level of value added and invests the most in labor. The strong performance of the restaurant sector is followed by the accommodation sector, which ranks first in terms of average fixed assets. Cultural industries, on the other hand, are the only sector where the average value added is greater than the average fixed assets.

Focusing on different LMA typologies, the ISTAT classification is in line with the descriptive statistics in Table 2. The *Great Beauty* typology represents areas where both output and input factors are, on average, nearly twice the national levels. The *Cultural Entrepreneurship* category also outperforms the national average in terms of value added, capital, and labor, reflecting a strong orientation toward tourism and cultural enterprise. In contrast, the *Cultural Peripherality* and *Heritage Potential* categories exhibit values below the national average. However, while the *Heritage Potential* areas possess significant cultural assets that could attract tourism, this is not the case for *Cultural Peripherality* areas, which demonstrate the weakest engagement in both tourism and cultural activities.

Fig. 1 shows the distribution of territories by vocation (right-hand side) and the prevalence of value added by sector (left-hand side). While some insights on the spatial clustering of the territories arise from Fig. 1, spatial dependence among the value added for the three sectors is statistically tested by univariate and bivariate Moran's I tests and LISA analysis.

Using Moran's I statistics, we find a significant and positive level of spatial dependence at the global level across all sectors considered. In all cases, the null hypothesis of spatial randomness is rejected, indicating that both intra- and inter-sectoral spatial correlation is present. Within sectors, the restaurant and accommodation industries exhibit the strongest level of spatial dependence, with Moran's I values of 0.220 and 0.189, respectively. Notable cross-sectoral spatial correlation is also observed, particularly from restaurants to the cultural sector (0.091), from restaurants to accommodation (0.149), and vice versa (0.139). These findings suggest meaningful spatial interlinkages not only within but also between the sectors analyzed. Additionally, the LISA significance cluster map (Fig. A1 in the Appendix) provides further evidence of localized spatial patterns for each of the three sectors.

[2] The database collects georeferenced information on Italian firms that are legally required to file financial statements. AIDA is the only data source providing detailed accounting information at the four-digit ATECO level and exhibits a high coverage rate of the corporate sector. However, it does not cover the entire universe of economic actors, particularly sole proprietorships, self-employed individuals, and non-incorporated entities. To address this limitation and verify the representativeness at the local level, AIDA microdata are integrated with structural data from ISTAT, which refer to the universe of firms in the sectors of interest over time. As a robustness check, for each year, structural data on the total number of firms in the three industries are combined with AIDA micro-level information to estimate sector-level aggregates at the local system level. Model estimates by using this integrated dataset (reported in Appendix C), confirm the reliability of the dataset and the consistency of the results.

6. Spatial and sectoral interdependencies among cultural and tourism industries

The estimation of the system of augmented Cobb-Douglas functions for the three sectors makes it possible to identify two primary channels through which spillovers influence production processes (RQ1). The first concerns the spatial diffusion of performance across territories, while the second relates to mechanisms tied to input factors, i.e. labor market dynamics and investment behavior. The discussion of the results in subsection 6.1 and 6.2 is structured accordingly, reflecting this dual analytical perspective. Moreover, in subsection 6.3, we assess the role of clusters in shaping productive linkages within the cultural and tourism sectors (RQ2). Finally, Section 6.4 discusses some possible sources of heterogeneity. The robustness of the main findings is confirmed by using alternative spatial weight configurations and a separate equation modelling strategy, as presented and discussed in Appendix C.

6.1. Spatio-temporal diffusion of productive performances

To shed light on how the performance of a given sector is shaped by vertical and horizontal linkages, as well as by spatial diffusion phenomena, the estimation results of Eq. (1) offer interesting insights into the nature and direction of productive interdependencies among the cultural and tourism sectors at the local level. Estimates of the model parameters allow to disentangle simultaneous, spatial, and temporal transmission mechanisms, both within and across sectors, thus capturing the multifaceted nature of productive dynamics in CTCs.

Results, which incorporate cultural and tourism vocations into the definition of spatial weights, provide evidence on the existence of such mechanisms with some differences across sectors. Hotels' output is the only affected by simultaneous changes in other sectors' performances, and in particular by restaurants' level of production (0.084). Considering spatial and temporal diffusion mechanisms, the restaurant sector is the less exposed to shocks generated by other sectors, while it's characterized by competitive effects across areas. Cultural and accommodation sectors are shaped by both intra-sectoral and inter-sectoral spatial spillovers with different signs and magnitudes depending on the transmission channel and time horizon.

In general, these findings confirm that the productive performance of tourism and cultural systems is not solely determined by horizontal and local factors but also by vertical linkages and external resources, stressing the role of industrial composition of neighboring areas, inter sectoral performances and temporal dynamics in shaping sectoral productivity.

Table 3
Model estimates and model comparison statistics for different combinations of spatial weight matrices.

	Cult.	Accom.	Rest.
Simultaneous			
lnY_{Ct}	-	0.007	0.000
lnY_{At}	0.005	-	0.028
lnY_{Rt}	0.005	0.084***	-
Spatial			
$WlnY_{Ct}$	0.380***	0.030**	−0.009
$WlnY_{At}$	0.006	0.205***	0.000
$WlnY_{Rt}$	−0.042***	0.019	−0.108***
Lagged Spatial			
$WlnY_{Ct-1}$	−0.639***	0.023	0.017
$WlnY_{At-1}$	0.005	−0.152***	−0.006
$WlnY_{Rt-1}$	−0.008	0.027***	−0.235***
Lagged			
lnY_{Ct-1}	0.730***	0.005	−0.001
lnY_{At-1}	−0.005	0.092***	−0.017
lnY_{Rt-1}	−0.006	−0.006	0.265***
Input factors			
lnL_{Ct}	0.467***	−0.040**	−0.004
lnL_{At}	−0.002	0.800***	−0.015
lnL_{Rt}	−0.017	−0.085***	0.608***
lnK_{Ct}	0.178***	0.012	−0.008
lnK_{At}	−0.004	0.252***	0.009
lnK_{Rt}	0.031*	−0.031	0.282***
	LL	**AIC**	**BIC**
	14158	−28405	−28790
Alternative specifications			
Intra-sec. W	*Inter-sec. W*		
W_{id}	W_1	14150	−28402	−28788
W_{id}	$W_{cluster} \times W_1$	14144	−28391	−28777
$W_{cluster} \times W_{id}$	W_1	14162	−28401	−28788

Note: *: p-value ≤0.10; **: p-value ≤0.05; ***: p-value ≤0.01.

6.2. Transmission mechanisms of input factors

To capture key dynamics between and within the three production processes, we focus on marginal effects of input factors (Elhorst, 2014). In the analysis we distinguish between (i) the instantaneous and time lagged impact of a one percent change of a specific input factor within a given area, also known as direct effects; (ii) the instantaneous and time lagged impact of a one percent change of a specific input factor in an area to neighboring areas, the so-called indirect effects. According to this classification, results reported in Table 4 are discussed first focusing on direct and then on indirect effects.

Regarding the direct impact of the input variables on sector-specific productive outcomes, we find that all sectors are labor-intensive with the hotel sector having the highest labor elasticity (0.8054) and the restaurant sector having the highest capital elasticity (0.2826). Moreover, the cultural sector is characterized by decreasing returns to scale (i.e., the sum of labor and capital elasticities is less than 1), and in the long run, this effect tends to diminish, although it remains statistically significant. While a similar decline is observed in other sectors, for cultural industries the decrease is relatively modest, suggesting a greater long-term resilience or stability in its production structure.

The analysis of direct inter-sectoral effects sourced and impacting cultural firms first suggests that capital investments in the restaurant sector in an area positively impact the output of the cultural sector in the same area (0.0316). Indeed, investments in restaurants can improve the local environment, making it more vibrant and attractive. This, in turn, makes the area more appealing for cultural offering, encouraging more visitors and higher participation in cultural activities. Restaurants and cultural firms often collaborate on events and promotions, such as food festivals, art exhibitions, or live performances. These collaborations can lead to increased visibility and higher attractiveness for both sectors, driving up the output of the cultural sector.

Second, the accommodation sector largely suffers from labor investments of the cultural sector (−0.0407). However, we find (at 10% significance level) a positive effect of capital investments in cultural industry (0.0117), confirming the role of cultural-related investments in physical assets in fostering hotels' performance. Conversely, the negative sign for labor suggests the existence of some borrowing dynamics, possibly reflecting an overlap between the two sector-specific labor markets, both of which are often characterized by shortages of qualified workers (Smeral et al., 2004). Alternative mechanisms may also reflect occupational mobility across the two industries, whereby workers with similar skills move between cultural and accommodation-related jobs as task requirements overlap, implying potential employment reclassification processes.

Even though beyond the main scope of this study, a third relevant finding concerns the tourism sector: specifically, we find that input investments in the restaurant sector have a negative spillover effect on hotel performance. This result can be attributed to the fact that the two sectors can serve as substitutes on certain services (Beerli-Palacio et al., 2020). Indeed, restaurants often provide lodging, and hotels usually offer food services, leading to inter-sectoral competitive pressures. Since both sectors aim to attract and host tourists interested in the same

Table 4
Marginal effects of input factors.

		Direct		Indirect	
		Short	Long	Short	Long
	Cultural				
Intra	lnK_{Ct}	0.1807***	0.1252***	0.1065***	−0.0892
sectoral	lnL_{Ct}	0.4744***	0.3287***	0.2797***	−0.2343
Inter	lnK_{Ht}	−0.0036	−0.0025	−0.0021	0.0018
sectoral	lnK_{Rt}	0.0316**	0.0219**	0.0186**	−0.0156
	lnL_{Ht}	−0.0024	−0.0017	−0.0014	0.0012
	lnL_{Rt}	−0.0174	−0.0121	−0.0103	0.0086
	Accommodation				
Intra	lnK_{Ht}	0.2541***	0.0219***	0.0647***	−0.0452
sectoral	lnL_{Ht}	0.8054***	0.0694**	0.2051***	−0.1432
Inter	lnK_{Ct}	0.0117*	0.0010	0.0030	−0.0021
sectoral	lnK_{Rt}	−0.0308***	−0.0027**	−0.0078**	0.0055*
	lnL_{Ct}	−0.0407***	−0.0035**	−0.0104**	0.0072
	lnL_{Rt}	−0.0853***	−0.0073***	−0.0217***	0.0152
	Restaurants				
Intra	lnK_{Rt}	0.2826***	0.0741***	−0.0275***	0.0417
sectoral	lnL_{Rt}	0.6097***	0.1596***	−0.0593***	0.0899*
Inter	lnK_{Ct}	−0.0077	−0.0022	0.0007	−0.0011
sectoral	lnK_{Ht}	0.0088	0.0023	−0.0009	0.0013
	lnL_{Ct}	−0.0041	−0.0011	0.0004	−0.0006
	lnL_{Ht}	−0.0151	−0.0040	0.0015	−0.0022

Note: *: p-value ≤0.10; **: p-value ≤0.05; ***: p-value ≤0.01.

destinations, this creates a competitive environment where investments in the restaurant sector can undermine the other. For instance, a well-capitalized restaurant that begins offering lodging can directly compete with nearby hotels for guests. Other possibilities may depend on the fact that increased investments in the restaurant sector may intensify competition for shared inputs, most notably labor, and for local tourist demand, thereby crowding out hotel performance and generating negative spillover effects.

Although within-areas effects are larger in magnitude than spillovers from neighboring areas, notable diffusion phenomena can be observed. Considering intra-sectoral spatial effects, being located near competitive destinations in terms of cultural- and accommodation-related investments can reinforce the attractiveness of the whole local area in the short run. On the other hand, we detect instantaneous competition effects between neighboring LMAs for food and beverage-related investments, as LMAs may attempt to create unique food experiences. In the long run both spillovers tend to vanish, becoming non-statistically significant.

Focusing on possible spatial inter-sectoral relationships, we find that, in the short-run, restaurants stimulate cultural production in neighboring areas (0.0186). Moreover, the short-run negative impact of capital investments in the restaurant sector on hotel performance also holds across neighboring LMAs. However, in the long run, the competitive pressure associated with the strong complementarity between the services offered by the two sectors turns into positive spillover effects, according to the long-term nature of fixed assets in generating positive effects.

6.3. The role of clusters in shaping sectoral productivity

To assess the role of clusters in shaping productive linkages within the cultural and tourism sectors, we compare our main results, obtained using the $W_{cluster} \times W_{id}$ matrix for intra-sectoral spillovers and $W_{cluster} \times W_1$ for inter-sectoral spatial mechanisms (i.e. including clusters in the estimation of the system's production function) with different combinations of matrices for inter and intra sectoral transmission channels, including those based solely on geographic proximity between areas. From a pure statistical point of view, the inclusion of clusters in the spatial transmission matrix improves the fit of the model to the data (see empirical likelihood, AIC, and BIC values in the bottom panel of Table 3). Comparing the results in Table 3 with the estimates from the model based solely on geographical distance (see Table C2 in Appendix C), some differences emerge. While the estimates related to the accommodation sector are broadly consistent across the two models, notable differences in the magnitude of impacts are observed for the cultural and restaurant sectors. In particular, when clusters are accounted for in the transmission of shocks, spatial and simultaneous effects lose strength and statistical significance. Therefore, spillovers in sectors like the cultural one and restaurants are shaped by the clusters' characteristics and the local context, reflecting complex productive linkages that are not solely determined by the geographical space.

In sum, estimating a model that accounts for clusters offers the key advantage of capturing proximity effects that go beyond geographical distance, such as sectoral synergies, shared infrastructures, or institutional linkages, which are often overlooked in models based solely on spatial distance. By incorporating cluster structures, the model can better identify channels of spillover transmission that are driven by functional or economic relationships, rather than mere physical closeness. This leads to a more accurate representation of interdependencies across regions and sectors, and enhances the model's explanatory power in contexts where cultural or tourism-related dynamics are not spatially uniform.

6.4. Potential sources of heterogeneity

This subsection investigates potential sources of heterogeneity in the relationships among the three sectors, the input and output factors, and the spatial spillover mechanisms. Beyond the heterogeneity already captured through individual and time fixed effects, we consider the possibility of heterogeneous relationships among the three production functions by estimating the system for: (i) geographic macro-areas (North, Center, and South–Islands of Italy), (ii) ISTAT territorial clusters, and (iii) structural changes associated with the pre-Covid and Covid/post-Covid periods. For reasons of space, all estimates are reported in Tables B1–B5 in Appendix B.

Table B1 reports the estimates obtained separately for the three Italian macro-areas. Overall, the results are broadly consistent with those derived from the full sample, both in terms of signs and

magnitudes. This alignment is particularly strong for the restaurant sector and cultural industries. In the accommodation sector, however, some discrepancies emerge in the Centre, although they do not alter the main conclusion: sector-specific dynamics remain predominant, and the productivity of labor and capital is remarkably stable across macro-areas within each sector.

A second potential source of heterogeneity relates to the ISTAT cluster classification. Tables B2–B4 show that, across clusters as well, own-sector-specific dynamics continue to dominate and display patterns consistent with those obtained for the full sample. Similarly, the productivity of input factors is largely stable across clusters. However, some cluster-specific nuances deserve attention. Within the cultural sector, areas classified as *Engine of Tourism* (ET) exhibit modest deviations from the general pattern: these territories display positive cross-sector associations with neighboring areas that materialize with a one-year lag, whereas in other clusters simultaneous or lagged spillovers tend to be predominantly negative. In the Accommodation sector, the *Cultural Peripherality* cluster shows a slight misalignment with the other clusters regarding the lagged effects of own performance and that of neighboring territories, suggesting a negative trend in the hotel sector. This cluster is characterized by a distinctly labor-intensive production structure (labor coefficient above 1) and a comparatively weak role for capital (0.17). By contrast, the Restaurant sector displays the highest degree of homogeneity across clusters. Notwithstanding this uniformity, both the *Heritage Potential* and the *Cultural Peripherality* clusters exhibit increasing returns to scale.

Given that the sample includes the years 2020–2021, we also assess whether the Covid-19 pandemic introduced structural breaks not fully captured by temporal fixed effects. Table B5 presents estimates obtained for two subperiods: 2011–2019 and 2020–2022. While estimates for the second period may be less reliable (consistent with concerns about the asymptotic properties of the estimator highlighted by Yang and Lee, 2019), the observed differences are relatively minor. Coefficients display only slight decreases in magnitude, indicating a general consistency between the estimates derived from the overall sample and those obtained for the two subperiods.

Overall, these analyses suggest that, although some localized discrepancies emerge across macro-areas, clusters, and periods, the core relationships identified in the main specification remain robust and broadly stable across the examined dimensions of potential heterogeneity.

7. Interactions between cultural-tourism clusters

The analysis performed in the previous section was aimed at assessing the role of agglomeration dynamics on productivity performances of cultural and tourism industries. However, to disentangle the sensitivity of each cluster type to shocks occurring in neighboring clusters (RQ3), and the effect of proximity between particular origin and destination clusters on sectoral productivity (RQ4) further analysis are necessary. Indeed, identifying the sensitivity of areas belonging to a specific cluster to shocks originating in neighboring territories can be crucial for understanding how interdependencies between origin and destination clusters influence productivity dynamics. This approach enables to detect potential relationships between clusters, highlight areas that may amplify or mitigate shocks arising from changes in investment or labor market conditions, identify territories where collaborative initiatives could be particularly effective due to shared cluster affiliation, and offer deeper insights into the strategic relevance of cluster-based policies for enhancing the performance of cultural and tourism industries.

To investigate these aspects, we examine indirect input effects differentiating across areas with different cultural vocations. In Table 5, we do not distinguish the origin of the shock by cluster type, estimating the average sensitivity of each cluster to input shocks occurring in its surrounding areas. Conversely, Fig. 2 disaggregates the analysis by both the origin and destination of the shock, allowing to capture potential variations in how different CTCs respond to cluster-specific shocks.

When accounting for the diversity of areas in terms of CTCs, several differences in the sensitivity of areas with different identity to shocks can be depicted. Specifically, the *Engine of Tourism* and *Cultural Entrepreneurship* clusters report the greater impacts in magnitude for all sectors and inputs, suggesting their sensitiveness to dynamics in labor markets and asset investments. This pattern is consistent with the low endowment of cultural and landscape heritage, combined with the presence of highly attractive cultural assets in these two clusters. On the other hand, *Great Beauty* and *Cultural Peripherality* clusters appear to be less affected by external shocks. *Great beauty* areas, known globally for their prestigious tourism assets, tend to be less sensible to neighboring dynamics due to their strong intrinsic attractiveness and self-sustaining appeal. Conversely, cultural peripheral areas may experience limited exposure to spillovers as a result of their geographic and functional isolation, which reduces their integration with surrounding economic dynamics.

Furthermore, distinguishing impacts by both the nature of the origin

Table 5
Indirect input effects differentiating by impacted areas with different cultural vocations.

		Short					Long				
		GB	HP	CE	ET	CP	GB	HP	CE	ET	CP
Cult.	lnL_{Ct}	**0.139**	**0.172**	**0.189**	**0.175**	**0.123**	**−0.084**	**−0.116**	**−0.134**	**−0.124**	**−0.081**
	lnK_{Ct}	**0.053**	**0.065**	**0.072**	**0.067**	**0.047**	**−0.032**	**−0.044**	**−0.051**	**−0.047**	**−0.031**
	lnL_{Ht}	−0.001	−0.001	−0.001	−0.001	−0.001	0.000	0.001	0.001	0.001	0.000
	lnL_{Rt}	−0.005	−0.006	−0.007	−0.006	−0.005	0.003	0.004	0.005	0.005	0.003
	lnK_{Ht}	−0.001	−0.001	−0.001	−0.001	−0.001	0.001	0.001	0.001	0.001	0.001
	lnK_{Rt}	0.009	0.011	0.013	0.012	0.008	−0.006	−0.008	−0.009	−0.008	−0.005
Accomm.	lnL_{Ht}	**0.111**	**0.134**	**0.145**	**0.135**	**0.097**	**−0.071**	**−0.088**	**−0.097**	**−0.090**	**−0.064**
	lnK_{Ht}	**0.035**	**0.042**	**0.046**	**0.043**	**0.031**	**−0.023**	**−0.028**	**−0.031**	**−0.028**	**−0.020**
	lnL_{Ct}	−0.006	−0.007	−0.007	−0.007	−0.005	0.004	0.004	0.005	0.005	0.003
	lnL_{Rt}	−0.012	−0.014	−0.015	−0.014	−0.010	0.008	0.009	0.010	0.010	0.007
	lnK_{Ct}	0.002	0.002	0.002	0.002	0.001	−0.001	−0.001	−0.001	−0.001	−0.001
	lnK_{Rt}	−0.004	−0.005	−0.006	−0.005	−0.004	0.003	0.003	0.004	0.003	0.002
Rest.	lnL_{Rt}	**−0.036**	**−0.042**	**−0.045**	**−0.042**	**−0.031**	**0.057**	**0.066**	**0.069**	**0.065**	**0.048**
	lnK_{Rt}	**−0.017**	**−0.020**	**−0.021**	**−0.019**	**−0.014**	**0.026**	**0.030**	**0.032**	**0.030**	**0.022**
	lnL_{Ct}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	−0.001	0.000	0.000
	lnL_{Ht}	0.001	0.001	0.001	0.001	0.001	−0.001	−0.002	−0.002	−0.002	−0.001
	lnK_{Ct}	0.001	0.001	0.001	0.001	0.000	−0.001	−0.001	−0.001	−0.001	−0.001
	lnK_{Ht}	−0.001	−0.001	−0.001	−0.001	0.000	0.001	0.001	0.001	0.001	0.001

Notes: Intra-sectoral effects in bold. GB = great beauty; HP = heritage potential; CE = cultural entrepreneurship; ET = engine of tourism; CP = cultural periphery.

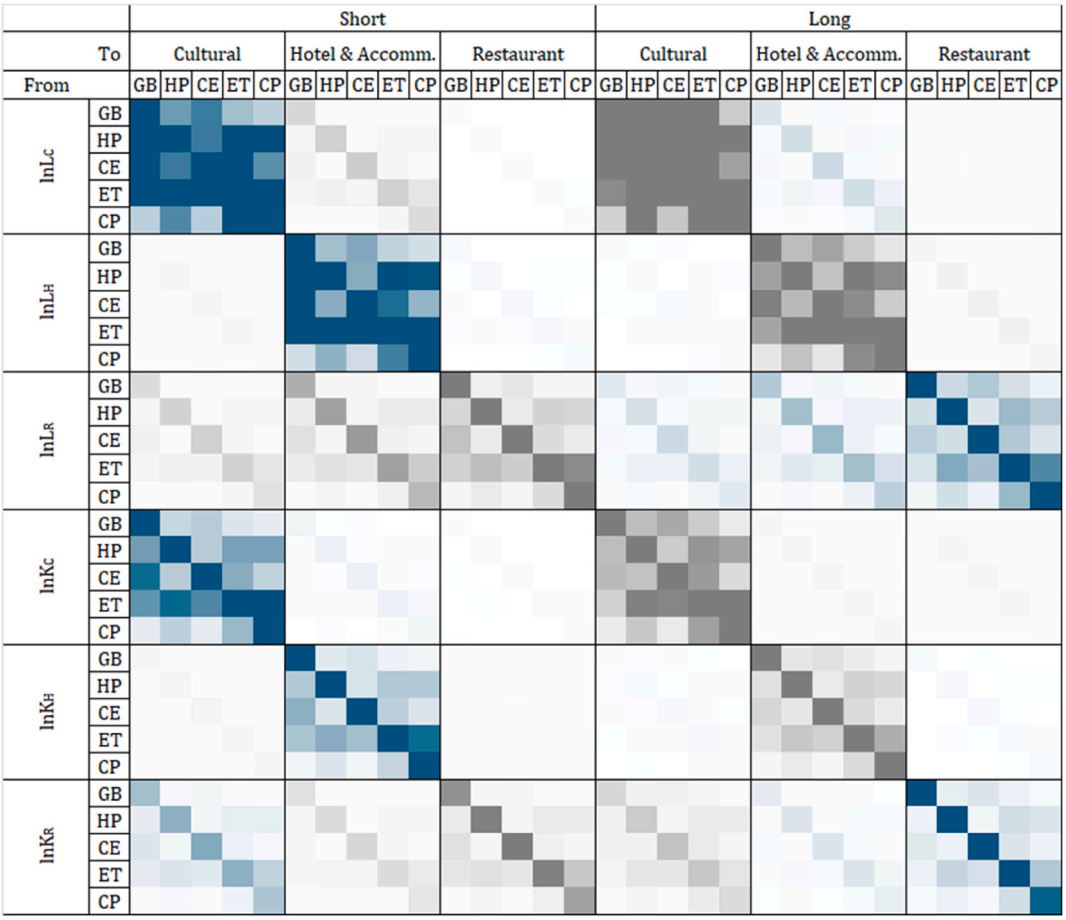

Fig. 2. Indirect impact of input factors between areas with different cultural vocations
Notes: Negative impacts in grey; positive impacts in blue. More intense colour as impact increases in absolute value. GB = great beauty; HP = heritage potential; CE = cultural entrepreneurship; ET = engine of tourism; CP = cultural periphery. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

area of the shock and that of the impacted area we are able to account also for the possibility that different clusters may generate or transmit shocks with varying degrees of intensity. This analysis involves the evaluation of 5 (origin clusters), times 5 (impacted clusters), times 3 (sectors), times 6 (inputs) leading to 450 marginal effect values in the short and additional 450 in the long run. To facilitate the interpretation of these results, we present them visually in Fig. 2. In the figure, negative impacts are indicated with grey shades, while positive effects are represented using increasingly intense shades of blue. Zero impacts are depicted in white.

In terms of magnitudes and signs, the results in Fig. 2 closely resemble the estimates shown in the right panel (Indirect) of Table 4. In particular, indirect effects are especially relevant for labor inputs and primarily occur within the same sectors, most notably the cultural sector, followed by the accommodation sector. These two sectors are largely shaped by intra-sectoral positive input spillovers, whereas restaurants exhibit negative spillovers in the short run for both labor and capital. However, these effects turn positive in the long run. Considering cross sectoral impacts, the most relevant effects arise from labor and capital investments in the restaurants sector, influencing both the cultural and hotel sector with varying magnitudes and signs depending on the time horizon considered.

However, what is particularly interesting to observe here are the differences across different LMA typologies, based on the cultural vocation classification of both the origin and the destination of the shock or change in inputs. Focusing on cultural vocation typologies, we find that impacts mainly occur within the same typology of CTC. This result may indicate that LMAs with similar cultural vocation are more integrated in terms of production networks, labor mobility, and visitor flows, which enhances the diffusion of spillovers within, rather than across, cluster types. Spillovers across different LMA typologies are primarily observed for labor within the cultural and hotel sectors, and for capital within the cultural sector. We discuss below the main findings related to spillovers between LMAs.

First, our results indicate that cultural and tourism industries productivity of areas belonging to the *Heritage Potential* and *Engine of Tourism* clusters generate the highest impacts in magnitude (either positive or negative) to all other areas, likely due to their clear economic identities. Indeed, heritage potential LMAs are characterized above all by landscape, natural, and urban endowments, and the presence of excellences, which in some cases can help shape the image and brand of the territory even at the international level. Similarly, *Engine of Tourism* areas are known for their significant tourism attractiveness despite their focus on tourism-related aspects other than cultural ones. Therefore, the nearby presence of these types of areas certainly has meaningful impacts on the production performance of neighboring territories, with competition or agglomeration externalities resulting from these poles depending on the kinds of mechanisms and sectors involved.

Second, we find weak effects between *Cultural Entrepreneurship* and *Heritage Potential* areas, likely due to their completely diverse cultural endowments. Indeed, while the main resource of the *Cultural Entrepreneurship* cluster is the entrepreneurial component with limited possibilities regarding cultural and landscape heritage, the *Heritage Potential* category corresponds to local systems where the richness of artistic,

cultural, and landscape heritage is not matched by a similar presence of higher education activities or cultural production. As a result, the markedly different cultural assets and functional roles of these clusters may limit the emergence of relevant inter-cluster spillovers.

Third, impacts originating from culturally peripheral areas tends to be lower in magnitude compared those from other clusters, especially when directed towards *Great Beauty* and *Cultural Entrepreneurship* LMAs. Moreover, the culturally peripheral category is also the least reactive to input spillovers originating from neighboring destinations with different vocations, especially belonging to the *Great Beauty* and Cultural *Entrepreneurship* categories. This finding may depend on the poor level of endowment and cultural production in these territories, which are mainly located in internal and peripheral areas and therefore are not able to exploit agglomeration externalities from attractive poles (ISTAT, 2015). As a result, their low attractiveness and limited cultural production hinder both the absorption and the transmission of spillovers, reinforcing their marginal position within the tourism system.

Finally, rather than acting as sources of spillovers, *Great Beauty* areas appear primarily as recipients, showing greater responsiveness to input investments originating from neighboring clusters with different cultural vocations. This suggests that, although labor and capital investments within iconic destinations are less likely to impact adjacent areas, these LMAs are more sensible to receiving spillover effects. This responsiveness is likely attributable to their rich and diverse tourism offerings, which enable them to absorb and enhance external demand by integrating complementary experiences reinforcing their position as central nodes within regional tourism ecosystems. Overall, this pattern underscores the structural asymmetry between iconic destinations and other cluster types, with the former acting as magnets that consolidate rather than diffuse regional spillover dynamics.

8. Conclusion

In this paper we investigate the impact of CTCs on the production performances of core cultural and tourism industries in Italy, taking into account possible interdependencies between the two sectors. The relationship between the cultural and tourism industry production is analyzed by means of a system of dynamic spatial panel data models at LMA-level for Italy in the period 2013-2022. The system incorporates a novel definition of CTCs in the weighting scheme characterizing spatial transmission mechanisms, allowing to model sectoral linkages across areas with varying degrees of cultural and tourism identity and specialization. Accounting for territories' cultural and tourism vocation provides a tool for formulating ad hoc place-based policies tailored to the specific cluster typology of both the area itself and its neighboring LMAs.

In terms of productive interdependencies (RQ1), we find that while the cultural sector positively influences the tourism industry through capital investments, tourism, and in particular investments in the restaurant sector, highly contribute to shaping the productive performance of cultural firms. For spatial diffusion effects, we find that, while spillovers mainly occur within the same sector, some inter-sectoral input spillovers may be observed from capital investments in the restaurant sector to cultural group (with positive signs) and between the restaurant and hotel sector (with negative signs).

Regarding the role of CTCs in the understanding of production linkages (RQ2), our results indicate that incorporating information on LMAs identity and specialization into the physical spatial weight matrix enhances both the interpretation of spillover effects and the model's statistical adequacy to the data. From an economic perspective, this approach facilitates the consideration of potential production complementarities and borrowing effects within CTCs, where the concentration of attractions and services may promote tourist mobility and foster shared development opportunities.

When considering spatial interdependencies between different cluster typologies (RQ3), we find that mid-tier clusters are more sensitive to external shocks, whereas prestigious tourism areas and culturally peripheral areas are less affected by neighboring dynamics. Differentiating by origin and destination of inter-cluster spillovers (RQ4), our findings suggest that the largest impacts originate from LMAs with a strong tourism orientation and those richly endowed with cultural amenities. In contrast, the most sensitive LMAs are those that combine notable tourist attractiveness with still-developing cultural assets, as well as those distinguished by a renowned cultural production fabric. Peripheral areas are those exhibiting the weakest connections with other territories, both in terms of the impacts they generate and their sensitivity to incoming externalities. As a result, they are likely to experience a widening gap compared to more culturally developed clusters.

Based on our results, some policy suggestions can be sketched. First, given the robust evidence across all spatial configurations showing that capital investments in the restaurant sector generate significant positive impacts on the productive performance of the cultural industry, policymakers should consider incentives or support measures aimed at encouraging investments in the restaurant sector. This could include tax incentives for capital investments or streamlined regulations to facilitate business growth. Second, policymakers should account for the specific local and contextual characteristics of each local area, by recognizing the different capacity of CTCs to generate and absorb spillovers. While iconic destinations and peripheral areas receive most of the attention in traditional strategies, it is the "intermediate clusters", such as *Engine of Tourism* and *Heritage Potential* areas, that often play the most dynamic and strategic role in shaping spillover patterns. Our findings indicate that these clusters act as functional bridges between high-performing tourism poles and more fragile areas. As such, they represent high-leverage nodes and should be prioritized in territorial development strategies. Public policies should therefore focus on consolidating the enabling conditions that allow these intermediate clusters to act as spillover generators. This includes strengthening their infrastructural and digital connectivity, supporting integrated governance models, and investing in capacity building for cultural operators and local administrations. At the same time, more structurally weak or peripheral clusters in terms of cultural endowment and production should benefit from targeted support to better connect with these high-potential intermediaries. In summary, a place-sensitive and network-oriented policy approach, which enhances the connective function of developed but not fully mature cultural industries, is key to amplifying spillovers, reducing territorial disparities, and supporting a sustainable and inclusive cultural-tourism development.

In future developments of this work, other than productivity spillovers, efficiency mechanisms should be evaluated by estimating a system of stochastic frontier models. This approach, despite complicating the estimation procedure due to the inclusion of a composite error term, would allow computing sector and time specific technical efficiency scores. A further expansion should also encompass modelling the productive interconnections with other related economic sectors, such as transports, entertainment, etc. Finally, from a methodological perspective, future research should focus on extending recent developments introduced in the univariate setting, such as spatial clustering techniques and interactive spatial models (see Anselin and Amaral (2024) and references therein), to systems of spatial panel data models in order to account for spatial heterogeneity.

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Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:all authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.econmod.2026.107649.

Data availability

The data that has been used is confidential.

Replication Package for "Cultural Industry Meets Tourism: Productive Intersectoral Spillovers and Cluster Synergies" (C. Bernini, S. Emili, F. Galli) (Reference data) (Mendeley Data)

References

Amisano, G., Giannini, C., 1997. Topics in Structural VAR Econometrics. Springer, Heidelberg.

Anselin, L., Amaral, P., 2024. Endogenous spatial regimes. J. Geogr. Syst. 26, 209–234.

Ashworth, G.J., 2009. Heritage and economy. In: Kitchin, R., Thrift, N. (Eds.), International Encyclopedia of Human Geography, ume five. Elsevier, pp. 104–108.

Basso, A., Funari, S., 2004. A quantitative approach to evaluate the relative efficiency of museums. J. Cult. Econ. 28 (3), 195–216.

Beerli-Palacio, A., Martín-Santana, J.D., Román-Montoya, C., 2020. Complementary services at hotels in accordance with their pricing strategy and the price sensitivity of tourists. Int. J. Hospit. Manag. 87, 102458.

Bernini, C., Galli, F., 2023a. Innovation, productivity and spillover effects in the Italian accommodation industry. Econ. Modell. 119, 106145.

Bernini, C., Galli, F., 2023b. Networking and spatial interactions: what contributes most to increasing museums' attractiveness? Pap. Reg. Sci. 102 (6), 1215–1232.

Bishop, P., Brand, S., 2003. The efficiency of museums: a stochastic frontier production function approach. Appl. Econ. 35 (17), 1853–1858.

Borowiecki, K.J., 2013. Geographic clustering and productivity: an instrumental variable approach for classical composers. J. Urban Econ. 73, 94–110.

Caragliu, A., Nijkamp, P., 2016. Space and knowledge spillovers in European regions: the impact of different forms of proximity on spatial knowledge diffusion. J. Econ. Geogr. 16 (3), 749–774. https://doi.org/10.1093/jeg/lbv042.

Cellini, R., Torrisi, G., 2013. Regional public spending for tourism in Italy: an empirical analysis. Tour. Econ. 19 (6), 1361–1384.

Cerisola, S., 2019. Cultural Heritage, Creativity and Economic Development. Edward Elgar Publishing number 18649, March.

Cerisola, S., Panzera, E., 2024. Heritage tourism and local prosperity: an empirical investigation of their controversial relationships. Tour. Econ. https://doi.org/10.1177/13548166241234099.

Chetia, P., Behera, S.R., Mishra, T., Parhi, M., 2025. FDI spillovers, innovation and the role of industrial clusters: evidence from innovative Indian manufacturing firms. Econ. Modell. 152, 107240.

Christopoulos, G., Wintjes, R., 2024. Identifying clusters as local innovation systems. J. Knowl. Econ. 15 (2), 9784–9823.

Cicerone, G., Crociata, A., Mantegazzi, D., 2021. Cultural and creative industries and regional diversification: does size matter? Pap. Reg. Sci. 100, 671–687.

Corrado, L., Fingleton, B., 2012. Where is the economics in spatial econometrics? J. Reg. Sci. 52 (2), 210–239.

Cracolici, M.F., Nijkamp, P., 2008. The attractiveness and competitiveness of tourist destinations: a study of Southern Italian regions. Tour. Manag. 30, 336–344.

Cuccia, T., Guccio, C., Rizzo, I., 2016. The effects of UNESCO world heritage list inscription on tourism destinations performance in Italian regions. Economic Modeling 53, 494, 490.

Cunningham, S., 2002. From cultural to creative industries: theory, industry and policy implications. Media Int. Aust. 102 (1), 54–65.

De Guzman, A.B., Leones, J.D., Tapia, K.K., Wonga, W.G., Castro, B.V., 2006. Segmenting motivation. Ann. Tourism Res. 33 (3), 863–867.

De Witte, K., Geys, B., 2011. Evaluating efficient public good provision: theory and evidence from a generalised conditional efficiency model for public libraries. J. Urban Econ. 69 (3), 319–327.

Del Barrio, M.-J, Herrero, L.-C., 2014. Evaluating the efficiency of museums using multiple outputs: evidence from a regional system of museums in Spain. Int. J. Cult. Policy 20 (2), 221–238.

Del Barrio-Tellado, M.J., Gomez-Vega, M., Herrero-Prieto, L.C., 2023. Performance of cultural heritage institutions: a regional perspective. Soc. Econ. Plann. Sci. 87, 101593.

Delgado, M., Porter, M.E., Stern, S., 2014. Clusters, convergence, and economic performance. Res. Pol. 43, 1785–1799.

Dellisanti, R., 2023. Spatial patterns of cultural and creative industries: creativity and filière behind concentration. Pap. Reg. Sci. 102, 533–564.

Dellisanti, R., 2024. Cultural and creative industries and local economic growth: exploring the urban channel. Spat. Econ. Rev. https://doi.org/10.1080/17421772.2024.2418924.

Dwyer, L., Forsyth, P., Spurr, R., 2003. Inter-industry effects of tourism growth: implications for destination managers. Tour. Econ. 9 (2), 117–132.

Elhorst, J.P., 2014. Spatial Econometrics. from cross-sectional Data to Spatial Panels. SpringerBriefs in Regional Science, Heidelberg.

Elhorst, J.P., Emili, S., 2022. A spatial econometric multivariate model of Okun's law. Reg. Sci. Urban Econ. 93, 103756.

Elhorst, J.P., Gross, M., Tereanu, E., 2021. Spillovers in space and time: where spatial econometrics and global VAR models meet. J. Econ. Surv. 35 (1), 192–226.

Emili, S., Galli, F., 2023. Spatial and cross-sectoral input spillover effects: the case of the Italian tourism industry. J. Prod. Anal. 59, 243–258.

Faulkner, R., Anderson, A., 1987. Short-term projects and emergent careers: evidence from Hollywood. Am. J. Sociol. 92, 879–909.

Fernandez-Blanco, V., Herrero, L.C., Prieto-Rodríguez, J., 2013. Performance of cultural heritage institutions. In: Rizzo, I., Mignosa, A. (Eds.), Handbook on Economics *of Cultural Heritage*. Edward Elgar Publishing Ltd, Cheltenham, pp. 470–490.

Figini, P., Patuelli, R., 2021. Estimating the economic impact of tourism in the European Union: review and computation. J. Trav. Res. 61 (6), 1409–1423.

Figini, P., Vici, L., 2012. Off-season tourists and the cultural offer of a mass-tourism destination: the case of Rimini. Tour. Manag. 33 (4), 825–839.

Finocchiaro Castro, M., Guccio, C., Rizzo, I., 2011. Public intervention on heritage conservation and determinants of heritage authorities' performance: a semi-parametric analysis.". Int. Tax Publ. Finance 18, 1–16.

Florida, R., 2002. The rise of the creative class and how it's transforming work, leisure, community and everyday life. Basic Books, New York.

Fuentes, Ramón, 2011. Efficiency of travel agencies: a case study of Alicante, Spain. Tour. Manag. 32 (1), 75–87.

Giuliani, E., 2007. The selective nature of knowledge networks in clusters: evidence from the wine industry. J. Econ. Geogr. 7, 139–168.

Giuliani, E., Rabellotti, R., van Dijk, M.P. (Eds.), 2005. Clusters Facing Competition: the Importance of the External Linkages. Ashgate, Aldershot.

Granovetter, M., 1985. Economic action and social structure: the problem of embeddedness. Am. J. Sociol. 91, 481–510.

Guccio, C., Pignataro, G., Rizzo, I., 2014. Evaluating the efficiency of public procurement contracts for cultural heritage conservation works in Italy. J. Cult. Econ. 38, 43–70.

Herrero, L.C., Sanz, J.A., Devesa, M., Bedate, A., del Barrio, M.J., 2006. The economic impact of cultural events: a case-study of Salamanca 2002, European capital of culture. Eur. Urban Reg. Stud. 13 (1), 41–57.

Herrero-Prieto, L.C., del Barrio-Tellado, M.J., 2020. Performance assessment in cultural institutions. In: Bille, T., Mignosa, A., Towse, R. (Eds.), Teaching Cultural Economics. Edward Elgar, Cheltenham, pp. 58–68.

Herrero-Prieto, L.C., Gómez-Vega, M., 2017. Cultural resources as a factor in cultural tourism attraction: technical efficiency estimation of regional destinations in Spain. Tour. Econ. 23, 260–280.

Hjalager, A.M., 2000. Tourism destinations and the concept of industrial districts. Tourism Hospit. Res. 2 (3), 199–213.

ISTAT, 2015. Annual report 2015 - the state of the nation. Retrievable at: https://www.istat.it/en/archivio/164908.

ISTAT, 2017. Conto Satellite Del Turismo per L'Italia. https://www.istat.it/it/files/2020/06/Conto-satellite-turismo.pdf.

Jackson, J., Murphy, P., 2002. Tourism destinations as clusters: analytical experiences from the new world. Tourism Hospit. Res. 4 (1), 36–52.

Jenkins, J., Dredge, D., Taplin, J., 2011. Destination Planning and Policy: Process and Practice. CABI, Wallingford.

Johansen, S., 1995. Identifying restrictions of linear equations with applications to simultaneous equations and cointegration. J. Econom. 69 (1), 111–132.

KEA, 2006. The economy of culture in Europe. retrievable at. https://cultureactioneurope.org/knowledge/creatives-industries/1-the-economy-of-culture-in-europe/.

Kelejian, H.H., Prucha, I.R., 1998. A generalized spatial two-stage least squares procedure for estimating a spatial autoregressive model with autoregressive disturbances. J. R. Estate Finance Econ. 17 (1), 99–121.

Kilian, L., Lütkepohl, H., 2017. Structural Vector Autoregressive Analysis. Cambridge University Press.

Kim, H., Cheng, C.K., O'Leary, J.T., 2007. Understanding participation patterns and trends in tourism cultural attractions. Tour. Manag. 28 (5), 1366–1371.

Kim, Y.R., Williams, A.M., Park, S., Chen, J.L., 2021. Spatial spillovers of agglomeration economies and productivity in the tourism industry: the case of the UK. Tour. Manag. 82, 104201.

Krugman, P., 1991. Increasing returns and economic geography. J. Polit. Econ. 99, 483–499.

Last, A.-K., Wetzel, H., 2010. The efficiency of German public theaters: a stochastic frontier analysis approach. J. Cult. Econ. 34, 89–110.

Lazzeretti, L., Capone, F., 2008. Mapping and analysing local tourism systems in Italy, 1991–2001. Tour. Geogr. 10 (2), 214–232.

Long, P., Morpeth, N.D., 2016. Tourism and the creative industries. Theories, policies and practice. In: Routledge Advances in Tourism. Routledge, New York.

Luksetich, W., Nold Hughes, P., 1997. Efficiency of fund-raising activities: an application of data envelopment analysis. Nonprofit Voluntary Sect. Q. 26 (1), 73–84.
Mairesse, F., Vanden Eeckaut, P., 2022. Museum assessment and FDH technology: towards a global approach. J. Cult. Econ. 26, 261–286.
Malerba, F., Mancusi, M.L., Montobbio, F., 2014. Innovation, international R&D spillovers and the sectoral heterogeneity of knowledge flows. Rev. World Econ. 149 (4), 697–722.
Marco Serrano, F., 2006. Monitoring managerial efficiency in the performing arts: a regional theatres network perspective. Ann. Oper. Res. 145 (1), 167–171.
Marrocu, E., Paci, R., 2013. Different tourists to different destinations: evidence from spatial interaction models. Tour. Manag. 39, 71–83.
Martin, R., Sunley, P., Gardiner, B., Evenhuis, E., Tyle, P., 2018. The city dimension of the productivity growth puzzle: the relative role of structural change and within-sector slowdown. J. Econ. Geogr. 18, 539–570.
Maskell, P., Lorenzen, M., 2004. The cluster as market organization. Urban Stud. 41 (5/6), 991–1009.
McKercher, B., Du Cros, H., 2002. Cultural Tourism: the Partnership Between Tourism and Cultural Heritage Management. Routledge.
Mizzau, L., Montanari, F., 2008. Cultural districts and the challenge of authenticity: the case of Piedmont, Italy. J. Econ. Geogr. 8, 651–673.
Mommaas, H., 2004. Cultural clusters and the post-industrial city: towards the remapping of urban cultural policy. Urban Stud. 41 (3), 507–532, 672.
Murrillo, V.J., Romani Fernández, J., Surinach, Caralt J., 2008. The impact of heritage on an urban economy: the case of Granada and the Alhambra. Tour. Econ. 14 (2), 361–376.
Normann, R., 1985. Service Management: Strategy and Leadership in Service Businesses. Wiley, New York.
O'Connor, J., 2010. The Cultural and Creative Industries: a Review of the Literature. Arts Council England. Creative Partnerships.
Pietrobelli, C., Rabellotti, R., 2006. Upgrading to Compete. Global Value Chains, Clusters and Smes in Latin America. Harvard University Press, Cambridge.
Pignataro, G., 2002. Measuring the efficiency of museums: a case study in sicily. In: Rizzo, I., Towse, R. (Eds.), The Economics of Heritage. A Study in the Political Economy of Culture in Sicily. Edward Elgar, Cheltenham, pp. 65–78.
Pinch, S., Henry, N., Jenkins, M., Tallman, S., 2003. From 'industrial districts' to 'knowledge clusters': a model of knowledge dissemination and competitive advantage in industrial agglomerations. J. Econ. Geogr. 3, 373–388.
Porter, M.E., 1990. The Competitive Advantage of Nations. Free Press, New York.
Potts, Jason D., Cunningham, Stuart D., Hartley, John, Ormerod, Paul, 2008. Social network markets : a new definition of the creative industries. J. Cult. Econ. 32 (3), 166–185.
Power, D., Scott, A. (Eds.), 2004. Cultural Industries and the Production of Culture. Routledge, London.
Reynès, F., 2019. The Cobb–Douglas function as a flexible function. A new perspective on homogeneous functions through the lens of output elasticities. Math. Soc. Sci. 97, 11–17.
Richards, G., 1996. Production and consumption of European cultural tourism. Ann. Tourism Res. 23, 261–283.
Richards, G., 2007. Cultural Tourism: Global and Local Perspectives. Haworth Press, New York.
Santagata, W., 2002. Cultural districts, property rights and sustainable economic growth. Int. J. Urban Reg. Res. 26 (1), 9–23.
Scott, A.J., 1999. The cultural economy: geography and the creative field. In: Media Culture and Society. Sage Publications, London.
Scott, A.J., 2000. The Cultural Economy of Cities—Essays on the Geography of Image-Producing Industries. Sage Publications, London.
Seaman, B.A., 2020. Economic impact of the arts. In: Handbook of Cultural Economics, third ed. Edward Elgar Publishing, pp. 241–253.
Slaper, T.F., Harmon, K.M., Rubin, B.M., 2018. Industry clusters and regional economic performance: a Study across U.S. metropolitan statistical areas. Econ. Dev. Q. 32 (1), 44–59.
Smeral, E., Mahringer, H., Huemer, U., 2004. Labour market problems in the hotel and restaurant business. WIFO Monthy Reports 77 (9), 689–696.
Stoddard, J., Davè, D., Evans, M., Clopton, S.W., 2006. Economic impact of the arts in a small US county. Tour. Econ. 12 (1), 101–121.
Storper, M., Venables, A.J., 2004. Buzz: face-to-face contact and the urban economy. J. Econ. Geogr. 4, 351–370.
The Measuring CCS Consortium, 2022. Final report. Available at: https://www.measuring-ccs.eu/the-measuring-ccs-consortium-publishes-the-final-report/.
UK-DCMS, 1998. Creative industries mapping document. retrievable at. https://www.gov.uk/government/-publications/creative-industries-mapping-documents-1998.
UK-DCMS, 2001. Creative industries mapping document. retrievable at. https://www.gov.uk/government/-publications/creative-industries-mapping-documents-2001.
UNCTAD, 2004. Creative Industries and Development. TD(XI)/BP/13 4 June.
UNCTAD, 2010. Creative economy report. retrievable at. http://unctad.org/en/Docs/ditctab20103_en.pdf.
Vang, J., Chaminade, C., 2007. Cultural clusters, global–local linkages and spillovers: theoretical and empirical insights from an exploratory study of Toronto's film cluster. Ind. Innovat. 14 (4), 401–420.
Vitaliano, D.F., 1998. Assessing public library efficiency using data envelopment analysis. Ann. Publ. Cooper. Econ. 69 (1), 107–122.
WIPO, 2003. Guide on Surveying the Economic Contribution of the Copyright-based Industries. World Intellectual Property Organization.
Wöber, K., Fesenmaier, D.R., 2004. A multi-criteria approach to destination benchmarking: a case study of state tourism advertising programs in the United States. J. Trav. Tourism Market. 16 (2–3), 1–18.
Yang, Y., 2016. Agglomeration density and labor productivity in China's tourism industry. Int. J. Tourism Res. 18, 434–446.
Yang, K., Lee, L.-F., 2019. Identification and estimation of spatial dynamic panel simultaneous equations models. Reg. Sci. Urban Econ. 76, 32–46.
Zieba, M., 2016. Tourism flows and the demand for regional and city theatres in Austria. J. Cult. Econ. 40, 191–221.