

CULTURAL HERITAGE EXPENDITURE. EFFECTIVE DRIVER OF ECONOMIC IMPACT OR JUST A PERCEPTION? – A SPATIAL PERSPECTIVE

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Abstract

The impact of the public expenditure in Heritage and Culture is a problematic question. The application of input output methodologies to heritage investment appraisal is discussed, with particular reference to the assessment of backward and forward spillovers and leakages and procedures for awarding public contracts. Maintenance and effective use and managements of cultural heritage involves many important economic and legal aspects.

Cultural and Heritage expenditure and investments depends on the specific objectives of the policy-makers at national and local level. We assume two models governing these public choices: a targeted distribution model in which restauration and conservation are the main determinants; the paternalistic distribution model in which the characteristic of local and territorial priorities are the main drivers consistent with the comparative advantages of the cultural endowment. Implementing such strategies is strictly correlated with the ability to support decision-makers and to increase people's awareness towards more comprehensive approaches to heritage preservation.

In the present work, a robust socioeconomic impact model is presented. The analysis indicated that the impact of public procurements in cultural heritage sites provide a range of both market and non-market benefits to the local society. The level of competition and openness provided with open procedures is also debated. The originality of the impact analysis is to go beyond the official/traditional data and indicators and propose "alternative" data-gathering methodologies supporting the econometric analysis conducted at local level, using Italian provinces as units of analysis. More than 22.000 contracts or culture-led projects have been analyzed.

As well as the impact of investment on the economy, the model also tries to explain the determinants of the distribution among the Italian provinces, considering the revealed preferences of the institutional authorities (the decision makers), the comparatives advantages of the cultural sites and the relative intensity of the expenditure and using a two stage regression model.

The principal conclusion emerging from this analysis is a positive effect on cultural investment on employment. This may suggest that spending decisions need more attention: they should consider the relevant consequences of a 10 year long slow-down of the economic cycle, the structural changes of the local economy and the limitation to highlight the impact only in term of tourism and real estate impacts.

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1 Introduction

1.1 The public investment in culture

This paper has the objective to build an alternative and complementary approach for the evaluation of the impact of public investments in culture in a local economic system. The role of public investment in culture on economy is an issue that has been very often ignored or undervalued, both for the limitations of a sector-wide approach in collecting consistent and complete data and because “culture and Heritage” or the cultural sector has a low priority in the allocations of the public budget expenditure.

Ideally, sector-wide programs should be informed by evidence that not only measures the flows of financial resources allocated over time to specific programs and project, as for example the Opencoesione dataset for the European Fund or the “public Contract” dataset of MIT, but also is able to extend the analysis and the evaluation to the direct (and indirect) impacts that may qualify the returns and the trade-offs between policy goals.

For public investment in culture we mean the amount of financial resources that, each year, different authorities allocate to the territory for the preservation, the renewal and the management of the physical endowment of culture (museums, archeological parks, historical building, gardens, churches)¹.

A country like Italy is supposed to receive an economic return from the existence of such Cultural Heritage, but on the other side the value of culture is not only strictly economic: the responsibility originating from the cultural endowment means a duty to maintain and preserve the stock of culture, its value, and its ability in generating positive spillovers, not only economic ones. In light of this, is there a way to consider culture as a source of investment, a source of income, or it's better to consider it simply as a responsibility and common good, useful for the society, the history and for the well-being of citizens?

¹ For the definition of core and non-core activities see Sacco PL and Segre Giovanna (2009).

The existing literature and research outcomes have tended to focus on general issues [3,4]², or public investments and institutions [5]³, to some extent overlooking the specific impacts of independent private or corporate projects.

Contemporary approaches to local and regional development often stress the importance of a multidimensional approach taking into account not only narrow economic, but also social, cultural and ecological considerations unique to the given spatial scale and geographic context [6,7]. Given such a broad interpretation of the concept, there are several potential areas where built heritage and projects linked with it may influence development processes [2–5]. As a result, rising attention has recently been directed towards the role played by public or private investments in the CH sectors as many benefits derive not from seeking better market access for tourists, but from the increased competitiveness and efficiency of the local communities.

Input-output analysis is a widely used methodology to examine the economic impact of an exogenous expenditure, such as the public expenditure in cultural assets⁴. First, their direct, indirect and induced economic impact on revenue and numbers of jobs, public sector revenue, and the real estate market must be taken into account [8]. Some local expenditures will generate higher local returns than others, considering the magnitude of the leakages. The economic leakage is a problem often encountered in the area of development research. It has been defined by Hegeland (1954)⁵ as a portion of a given stream of spending which is not re-spent within the period considered. Hansen (1953)⁶ identified five sources, among which the part of purchases supplied by other regions who in turn fail to employ local resources and generate local income and employment.

The strength of multiplier effects, including the tourism multiplier as suggested by Hampton (2005), is dependent on whether suppliers (generating indirect multiplier effects) and employees of heritage sites and tourist businesses (generating induced multiplier effects) are locally (regionally) recruited and embedded⁷. The scope of economic effects is also strongly dependent on the size and character of the main tourist market segments catered for, including the percentage of overnight visitors. Attracting larger numbers of tourists with low prices will not necessarily lead to greater profits from tourism. It is more likely to cause a decline in the quality of the sightseeing experience and the deterioration of the site, especially given that culturally oriented tourists tend to be “price insensitive”⁸. Not every built heritage initiative will have culturally integrated effects, i.e. both enhance and present a site’s complex heritage qualities and produce results which answer the local community’s needs.

Local residents’ attitudes towards built heritage, their awareness of its value and commercial potential, but also their agricultural, craft and entrepreneurship skills and financial resources matter greatly.

Did the public authority allocate the public funds according to some specific features or needs of the territory, like the preservation of historical artefacts or the valorization of the heritage patrimony conserved in the museums and archeological parks or other events that are deemed significant and necessary for the dissemination of culture and artistic knowledge?

The actors involved in the investment/expenditure decision have specific goals as well as conflicts, but at the end the policy-maker operates with a budget constraint and the rationale solution seems to reflect the reality

² See E. Bowitz, K. Ibenholt (2009) and J. McLoughlin, J. Kaminski, B. Sodagar.

³ See M. Cernea (2001)

⁴ See Miller RE, Blair PD (2009)

⁵ See Hegelenad, H. (1954),

⁶ See Hansen A.L. (1953),

⁷ See M.P. Hampton (2005),

⁸ S. Caserta, A.P. Russo (2002).

of number, i.e the competition among different goals and priorities and the efficiency of the choices that reap benefits and attractive economic solutions for both parties, the policy-maker and the bidder.

Considering instead a paternalistic distribution model, other characteristics of the local territorial unit should be considered by the public authority to praise a particular territory or project. As soon as we consider culture and heritage a *common good*, that is shared by a group of people in consumption and possession, the market rules are supposed to fail without a public intervention. In this case the decision to make an investment in proportion to the cultural awareness of the province maybe both index of the need for larger resources to preserve and maintain that inheritance, resulting in an economically un-productive investment.

Even in case of a clear economic exploitation of culture, and thus of a monetary disbursement made with the intention to have a return, the decision may underline a paternalistic intention in which culture is seen as a resource to help the less economically developed areas of the countries. Our model, and our empirical investigation, will tries to answer to these interesting questions, with the further and final aim to evaluate empirically, the impact of the expenditure/investment decisions on employment and income at local level.

Questions:

How much is Government and Local Authorities spent to support conservation of Cultural Heritage?

What are the impacts of public expenditure on employment and income?

What factors determine public financial allocations in and for Cultural Heritage, and which are the channels (direct and indirect) through which public investment interacts with the economic system? Which is the role of art and entertainment industry?

The specificity of the estimation method is the spatial-dimension given to the analysis: a model for spatial auto-regression of the dependent variable will be applied, answering the following question: how much of the spatial variability of our response variable (employment) can be ascribed to the effect of investment rather than to special proximity and interdependence?

Concluding reflections on potential avenues to improve expenditure allocations.

1.2 Public Expenditure in Culture in Italy-Data and Statistics

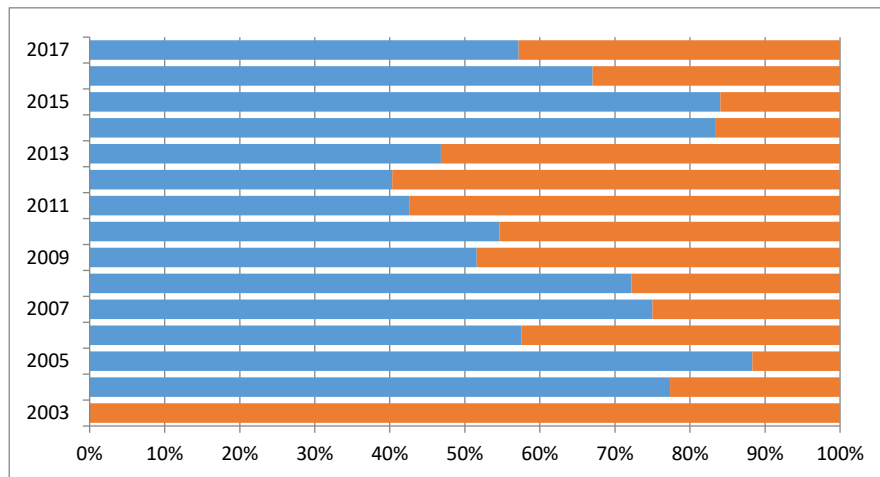
Facts, challenges, and performance

Public spending in the Cultural and Heritage sector grew steadily since the early 2000s to a peak of over EUR 250 million in awarded contracts in 2014 and 2015.⁹ The peak years of public procurement contracting also coincided with the organizational reform of MIBACT.

EU funds have been playing an increasingly important role in heritage and cultural expenditure, providing for roughly more than half of all public procurement announcements during 2007–2013 (Figure 1). EU funds are disbursed at seven-year budget cycles (2000–2006; 2007–2013) under the so-called “n + 2” rule, meaning that money has to be contracted at the latest by year n (e.g., 2013) and invoiced by year n + 2 (e.g., 2015), or has to be returned to the EU budget. In fact, the peaks in 2007–2008 and 2014–2015 reflect the pressure on the Italian authorities to spend funds at any cost before their eligibility period ran out.

⁹ The authors have taken all due care to ensure that the provided data are comparable across years. However, some changes were detected in the legislation and the reporting system since 2012, which might bias the comparability of data over time. If not mentioned otherwise all public procurement data refer to values without VAT.

Figure 1: Share of CMCH expenditures financed from European funds (left-hand side)



Source: ACTORS.2 Dataset

When using European funds, the contracts must comply with European public procurement directives, when the notice value (estimated cost) is “above the EU threshold,” assuming that this threshold is the minimum value of the procurement that affects the **internal market**. For the cultural sector, defined in TED¹⁰ as “recreation, culture, and religion,” we find **209 contracts** in the five southern regions out of 180.783 of the all TED-Italy, so we may conclude that the large spectrum of public procurements falls below the EU threshold, and they are implemented under national rules, legal acts, and professional judgment of the contracting authorities.

Cultural and heritage assets play a substantial role in the 2007–2013 programming of the five southern regions, where specific measures were implemented for the conservation, restoration, and extended valorization in support of touristic activities. For this particular source of funding, some authors (*Viesti-Luongo, 2014*) find several reasons for uncertainties and implementation difficulties when decision makers and contracting authorities apply the cohesion policy rules on where the funds are placed.

There are certain shortcomings in the programming capacity of investment expenditure and the weaknesses of cultural policies that operate on a time horizon burdened by considerable uncertainty. There is weakness and fragility in the ordinary policies, which make difficult the long-term understanding of the shared and sustainable actions necessary for investment policies. There are also administrative delays, resulting from the application of community regulations on project design, procurement procedures, reporting and certification of expenditures, whose complexity is not always manageable by local administrations (except for formal controls), but come at the expense of a more effective assessment of spending and ex-post impact. The delays in the initial phase of the 2007–2013 EU programming are well-identified in Figure 1. The programming cycle shows a significant delay in the start-up phase, linked to the slowness of the procedures for project preparation and approval, activation of the tenders, and at the participant’s evaluation stages.

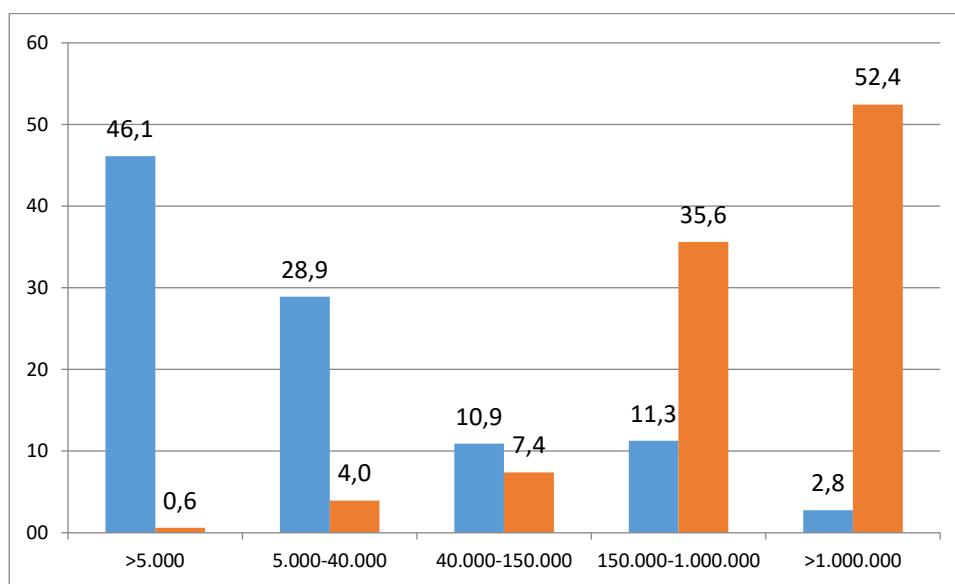
Other drawbacks concern the interpretation of **transparency** when directly awarding contracts, as allowed by the national procurement procedures. It is debatable how the principle of transparency outlined in the EU regulations and interpretative communications should be observed. The advertisement of the notice can be made using different actions that fall under the broad definition of transparency. For instance, the Italian practice to publish a “non-binding call for interest” or an “intention to purchase services,” or to invite selected suppliers with a “letter of invitation” or publish a notice on the website of the purchasing authority may fit well planned activities and projects to be procured with negotiated procedures, while, from an economic viewpoint, it may be inefficient for smaller contracts or those irrelevant for the EU internal market, but may

¹⁰ TED (Tenders Electronic Daily) is the online version of the Supplement to the Official Journal of the EU (OJ S) dedicated to European public procurement.

add high value to the participation of SME in the best interest of local markets and communities. After all, we have to stress that the need to advertise the planned procurement, as regulated by the EU procurement legislation, has its rationale for strengthening the internal market, while the Cohesion Fund aims to provide economic and social convergence across different territories and regions. The question is whether the two European goals move on different paths and use conflicting methods and procedures when contracting for services and construction works.

There is also another legal principle that should be applied, the **proportionality principle**. It is difficult to justify administrative efforts and the associated costs of preparing the documentation, or advertising notices for purchases of small economic values. In the dataset, 46.4% of the awarded contracts have a value below EUR 5,000, which represent less than the 0.6% of cultural expenditure during the analyzed period (Figure 2). At the other end of the spectrum, there are 253 large contracts, with an award value above EUR 1 million that absorb together half of the total expenditure over the analyzed period.¹¹

Figure 2: Percentage distribution of public procurement contracts: number and value



Source: CMCH Dataset

It is rather difficult to find a coherent and consistent economic rationale to justify the same set of “formal” rules, when considering the “value for money” of awarded CMCH contracts: more than 50% of these activities have a cumulated value that does not exceed 1% of the total expenditure. The value for money, as a “monetary” direct cost, should not disregard “non-monetary” indirect costs (transaction costs), represented by the burden of administrative procedures, time, and search costs. There are strong reasons to believe that the marginal benefits to consumers and producers are irrelevant for a large part of the activities, unless the policy makers would raise the flag of transparency as a merit good, and convince the taxpayer that the

¹¹ These consideration for cultural expenditure contracts can be generalized. In the 2015 Autorità nazionale anticorruzione (ANAC) annual report, the sixth chapter provides an extensive statistical analysis of the public contracts awarded during the year. Public procurements are grouped by the number of contracts (CIG codes delivered); total value; distribution by dimensional classes, type of contract, and type of contracting authority. The analysis compares the achievements with those of the previous year, considering the contracts units of measurement (an end? a mean? what else?) that increase or decrease, instead of outcomes of a decision process involving different economic subjects and different motivations. We find the same order of polarization. Using Tables 6.2 and 6.3 of the 2015 report, although with different scales, 71.594 contracts have a value in the range of EUR 40.000–150.000, representing more than 50% of the total public contracts awarded in 2015 by central and local authorities. The total value is EUR 5.941 million or 5.1% of the total public expenditure in services, acquisition of goods, and construction work. The 559 largest contracts, those over EUR 25 million accounts for 0.4% of the contracts but hold 41.6% of the total value (EUR 48.762 million).

respect of the “formal” and “uniform” procedures is a value in itself. The final result is a waste of money (resources) with poor outcomes of the cultural expenditure.¹²

The EU Commission is well aware of this problem and provided an Interpretation¹³ when dealing with contracts not covered by the Directives: contracting authorities may directly award contracts not covered by the European Directives (i.e., without prior publication of an advertisement). The relevant derogation regards situations of extreme urgency and contracts that may be executed only by one particular operator due to technical or artistic reasons or for reasons connected with the protection of property rights.

Decisions should thus be taken on a case-by-case basis, because this is a procedure coherent with the principle of **proportionality**, intended as balance between the administrative and other costs associated with certain procedures not justified by the value of the contract. Instead, an honest professional judgment, based on the principle of proportionality (without denying the respect of transparency) should guide the solutions for cases dealing with under-threshold contracts. The strict interpretation of the rules or “gold plating” of public procurement rules should be avoided because it is a poor example of lack of expertise.¹⁴

2 Literature review

A clear difference can be noticed in the approaches and methods of evaluation : the majority of the academic literature has a **managerial approach**, considering the tourism as the outcome and the channel through which is possible to measure the impact of culture (as the ability to attract visitors, organize the demand and provide services in the preferred destinations; or as the ability to generate an induced tourist expenditure producing revenue and reputation).

On the other side a **narrative approach** based on historical accounts or on influential evidence of case studies, where the indicators of impact are identified with more details and supported qualitatively with specific research (usually questionnaires).

These different approaches are widely used to explain the economic impact of preservation, conservation, restoration projects, as well as the effects of museum or cultural activities on local employment and revenues, including local tax revenues. More recent research has been extended to evaluate the impact of cultural projects in urban regeneration and renewal, as for *Florida (2002)*, *Camagni –Cappello (2009)*¹⁵.

Another common approach in dealing with the effect of expenditure on the economic system provides for the use of input-output tables, with the measurement of income multipliers, in line with the economic school started with *Throsby (2000)*.

Quantitative or econometric analysis are narrow in their scope, addressing the determinants of the prices of museums and the willingness to pay of their visitors, like *Goetzmann, Oster (2003)*.

Useful suggestions may be found in the literature of the determinant of the public expenditure in infrastructures, research & development and public health. An example is *Bogetic, Hefley, Randolph (1996)*, in which the authors addressed the issue of the socio-economic determinants of public expenditures.

¹² Similar to the “leaky bucket” argument of Arthur M. Okun in his 1975 book, *Equality and Efficiency: The Big Tradeoff*, in this case, we redistribute functions and tasks with a value for balancing the non-monetary costs against improvement in efficiency and transparency.

¹³ European Commission Interpretative Communication 2006/C 179/02 on the Community law applicable to contract awards not or not fully subject to the provisions of the Public Procurement Directives.

¹⁴ The European Commission defines gold plating as an excess of norms, guidelines, and procedures accumulated at national, regional, and local levels, which interfere the requirements of EU legislation when transposing Directives into national law.

¹⁵ See Camagni R., Capello R. (2009)

Tubadji, Osoka, Nijkamp (2014) distinguish the living and past cultural heritage: Both kind of expenditure have a positive impact on the added value: in particular the existing stock, as a proxy of the past-cultural heritage and therefore different from the investment, has a positive effect on the per capita-income.

The scarcity of studies on the effects of CH expenditure on employments and income is partly explained by the challenging identification issues faced when using aggregate country- or sector-level data, and by the lack of accurate data on capital expenditure by the procurement authorities in Public expenditure data sets (for instance, Opencoesione).

We contribute to the literature by estimating the impact of CH expenditure on employment. To this purpose, we use an original and complete dataset of more than 22.000 public procurements awarded in the period 2004-2017 with detailed information on the specific content and conditions, duration, procurement authorities and awarded firm.

3 Level of heritage and cultural expenditures

One of the main features of the cultural expenditure during 2004–2017 is the decentralization that affects both the decisions and tender operations. Conservation and valorization services are organized at the national, regional, and local levels through a network of public or private (association or foundations) operators and agencies.

The first is MIBACT, with the institutional and exclusive function of heritage protection and conservation, and support to sector development and valorization to make cultural property accessible to the large public. The Ministry operates through a decentralized network of 17 techno-scientific structures, namely “Soprintendenze,” “Regional Directions,” and, since 2014, “Poli Museali,” which organize the investigation of cultural resources, oversee and manage the national museums and archeological parks (over 440 sites), and fund and support public projects within the regions. At the local level, the regions and the municipalities have the important institutional role to promote their territories and administer particularly relevant artistic and cultural assets.

While the national budget provides funding for managing the ordinary expenses of the decentralized Soprintendenze, regional directorates, and museums/archeological parks, the additional financial resources of the EU structural funds provided the incentive for further investments and development of cultural assets. Those funds have been channeled through national and regional agencies, with the aim of modernizing the structures of cultural delivery. More recently, a greater autonomy was given to 20 major museums, who became fully responsible for budget, financing, and technical decisions.

The evolution of the cultural policy and the autonomy granted by the reforms may motivate an empirical study that compares efficiency in terms of the cultural outcomes achieved by the contracting authorities. To the best of our knowledge, no study has been carried out in this respect.

Therefore, this paper explores the relative efficiency in terms of procurement outcomes achieved by different types of contracting authorities. The procurement outcomes considered include prices paid to authorities of museums, artistic monuments, or archeological parks to procure works, goods, and services. The types of authorities include central, ones such as MIBACT and Soprintendenze, or local ones, such as regional authorities, autonomous museums, and foundations.

More centralized agencies may have different degrees of expertise and bargaining power in the procurement of construction works, technologies, expertise in services, which has implication for budgeting and the cost of providing public cultural services.

In the procurement contract database, we added a new variable (*authority*) so the regression outcomes can be compared.

The centralized contracting authorities are organized at the national level under MIBACT and its regional network of Soprintendenze. The regional decentralized authorities are departments within the regions of agencies that provide cultural services. At local level the municipalities provide services or manages investment expenditures supported by regional funds.

4 Model

There are two different mechanisms through which culture and the economic system interact: on one side there is a kind of **attraction gear**, that describes all the determinants of the attraction on the territory (what determines investment expenditure), and on the other one there is the **interaction gear**, that analyses the ability of the investment to generate economic wealth exploring the different channels through which the investments plays a role in the economy (*Tubadji, Osoba, Nijkamp (2014)*).

To illustrate the economic impact, we assume that the level of employment adjusts according to the following structural equation:

$$\text{Empl_tot}_i = \beta_0 + \beta_{i1} \text{ i.years} + \beta_2 * \text{population}_i + \beta_3 * \text{NumberMuseums}_i + \beta_4 * \text{firms_art}_i + \beta_5 * \text{firms_hotels\&foods}_i + \epsilon_i \quad (1)$$

Equation (1) models the impact of the public expenditure in culture (award) in the generation of employment: it represents the second stage of a two-stages regression, in which the first three variables are the set of exogenous regressors, while the last two are the endogenous ones.

Endogenous variables are the result of two first-stage regressions (eq 2-3) on the same exogenous variables used in the second stage, and a set of instruments, different for each instrumented variable. The methodology reproduces an instrumental variable panel regression in two stages, conducted manually in order to associate each instrumented variable with its proper set of instruments. The weighting contiguity matrix for the estimation of the model is built using as references the shapes files of ISTAT's geographical census.

From the point of view of development economic theory and public choices, this approach can be motivated by the assumption that the allocation of investment by the public authority are driven, at least in minimal part, by an economic argument, as well as the non-economic ones like the preservation and the restoration of the cultural heritage.

The two first-stage equations are the following:

$$\text{Firms_art}_{i,t} = \beta_0 + \beta_{i1} \text{ i.years} + \beta_2 * \text{population}_{i,t} + \beta_3 * \text{NumberMuseums}_{i,t} + \beta_4 * \text{award}_{i,t-1}$$

$$+ \beta_5 * \text{days_art}_{i,t-1}^{16} + \beta_6 * \text{CVA_Surface} + \beta_7 * \text{CVA_GConserved}_{i,t} + \beta_8 * \text{open}_{i,t-1} * \text{award}_{i,t-1} + \beta_8 * \text{direct}_{i,t-1} * \text{award}_{i,t-1} + \varepsilon_i \quad (2)$$

$$\text{Firms_hotels\&food}_{i,t} = \beta_0 + \beta_{i1} \text{i.years} + \beta_2 * \text{population}_{i,t} + \beta_3 * \text{NumberMuseums}_{i,t} + \beta_4 * \text{award}_{i,t-1} + \beta_5 * \text{days_hotels\&food}_{i,t-1} + \varepsilon_i \quad (3)$$

Hypothesis

H1 The first hypothesis is represented by the equation (1) that shapes, using a random-effects model, the relationship between total employment (*tot_empl*) and expenditure in Culture and Heritage (*CH_award*) as indirectly passing through those sectors of economy more likely to be interested by the cultural investment: the industry of hotels and hospitality and the world of creative industry (art and entertainment's sector). The first-stage equations (2-3) include a **lagged independent** variable considering that the effects of the expenditure (capital expenditure like any investment) may produce effects not just in the year of investment but also in years following. The expectation for the first hypothesis is that a large amount of public contracts in CH assets are therefore more likely to generate a bigger tourist attraction and an increase in the number of sector-specific firms, with the consequent creation of new job and employment, according to the causal relation of the income multiplier.

H2 The second hypothesis is represented by equations (2-3) that portrays the relationship between, respectively, the number of firms belonging to the hotel and hospitality sector and to the artistic and entertainment one, and a set of *observable local (space) specific determinants*, representing, in addition to the flow (the investment), the role played by cultural heritage as a stock. Some of these local determinants linked to culture are for example the number of museums, the groups of tourists registered to visit them or the presence of a UNESCO site. We also have included some specific CVA indexes that indicate the "advantage" or "disadvantage" of the province in the relative endowment of a specific "good". We expect, first of all, that communities/authorities with a high awareness of the values of culture (high level of expenditure) and high concentration of cultural venues or artefacts are more likely to attract tourism and entrepreneurial activities linked to the touristic sector, flanking and supporting the role of investment. Therefore, we could also assume, as policy implication for the direction of investments, that territories would be more inclined to spend when communities/authorities have a rich and appreciated cultural endowments. The causal relation for this hypothesis is as follows: the higher the CVA, the higher the probability that is going to spend more and support more cultural initiatives.

H3 The third hypothesis is represented by the equation (1) that portrays the relationship between total employment (*tot_empl*) and a set of *observable institutional/contract specific determinants* governing the procurement process that are going to be captured considering the competitive environment of the participants. We expect that the competitive bidding (*open procedures*) influences the relationship between *CH_award* and *total employment* because it reduces collusion and rent seeking, it creates incentives for efficiency and lower prices, it reduces the un-observed costs of corruption, it creates opportunities for the users. The causal relation for this hypothesis is as follows: since the public procurement has become a development tool, the competitive procedures are able to create incentives and opportunities for the bidding firms that generate more dynamism in the economy with more employment and income

At this stage we assume, in line with recent studies on the political economy, that the providers of funds/financial resources (Authorities) direct the resources to those initiatives that are relatively easy for ordinary people to attribute to government's action and efforts determinants of the allocation. CH is not

¹⁶ Omitted in the ten-years specification for data availability

always favored in this context since visibility of other types of expenditure/investment are often more evident.

Second, the lag between public spending and outputs (attractors, new museums and archeological parks, new collections, etc.) is a time process that last often many years and the outcome (with expected benefits) cannot be seen quickly, unless we turn to the number of visitors the most common indicator of performance or productivity.

Third, a typical principal-agent issue, since the rules of public administration and budget institutions in defining goals and priorities do little to constrain the excessive influence of those with less HC information.

We evaluate and compare two econometric methods for estimating the dataset of more than 22,000 observations and a variety of known characteristics. We use a spatial model with fixed effects, in two steps, to analyze the impact at provincial level (108 provinces). The choice of a spatial model is dictated by the need to correct response variables from fixed effects and spatial autocorrelation.

The independent variables are the following:

- *CH_award (award)* is the total amount of funds, for the year and the province to which the observation belongs, allocated for culture.
- *CVA_d* the **cultural venue advantage**. It compares the relative endowment of cultural venues in each province, with respect to the national average. The cultural venue is defined and selected as places of arts, museums, galleries, archeological parks, built heritage. The property of the cultural venue (CV) have been measured and classified with three criteria, as a tool for knowledge representation in term of size (surface) or for the purpose of facilitating their use and ensuring access (displayed collections - GExposed or conservation - GConserved). The indexes draw on data collected by ISTAT 2015 census survey on 4,500 institutes over the national territory. Both the local and the national endowment are expressed as a ratio with respect to the total surface, in km² respectively of the province and of the national territory.

The index is calculated as

$$CVA_{it} = \frac{CV_{it}}{ShapeArea_{it}} / \frac{CV_{Tt}}{ShapeArea_{Tt}}$$

where $CV_i/ShapeArea_i$ is the ratio of cultural venues per square kilometer of land in each province i in a specific year and $CV_{Tt}/ShapeArea_T$ is the ratio of national (total) cultural venues per square kilometers of land, as an average proxy of attractiveness.

This index tests the assumption that the agglomeration of cultural attractions produces both money values and sentimental values that will impact positively on the economic patterns, with the public authority that prizes the provinces with a bigger endowment. The higher the ratio, which can range from zero to infinity, the more competitive is the cultural offer of the province, and most accelerated should be the effect of cultural expenditure on the dependent variables.

- *Procedure* divides observation in three categories: *open_proc (open)*, *negotiated_proc (negotiated)* and *direct_proc (direct)*, according to the awarding procedure that is used. The division is also expressed with three corresponding dummy variables. When the panel is created, each of the dummy becomes a weighted average between 0 and 1, representing the proportion, over the total, of contracts awarded with that specific procedure.

- *Unesco* is a variable equal to 0 if, until 2017, nothing belonging to the considered province was declared *World Heritage Site* by Unesco, and otherwise equal to the number of sites, in the considered province, declared UNESCO World Heritage.
- *Days_hotels&foods (days_i)* represents the total number of working days, for the province and the year to which the observation belongs, worked in the sector of hotels and hospitality.¹⁷
- *Days_art (days_r)* represents the total number of working days, for the province and the year to which the observation belongs, worked in the sector of art, sport and entertainment. Data are available from 2014.¹⁸
- *GroupVisits (groups)* is the total number of groups of tourists registered in the 4,500 institutes interested by the ISTAT Survey.

Endogenous regressors are the following:

- *Firms_art (firms_r)* is the total number of firms, for the province and the year to which the observation belongs, in the sector of art, sport and entertainment. Data are collected by the surveys conducted by the Statistical Observatories of the INPS institute and includes firm of each dimensional class.¹⁹
- *Firms_hotels&food (firms_i)* is the total number of firms, for the province and the year to which the observation belongs, in the sector hotels and hospitality. Data are collected by the surveys conducted by the Statistical Observatories of the INPS institute and includes firm of each dimensional class.²⁰

Exogenous variables are:

- *years* is a categorical variable that indicates the year (years from 2008 to 2017 will be considered), to which the observation belongs. In the regression the reference year is 2008.
- *Population (pop)*, used as a control.
- *NumberMuseums (museums)*, for the year and the province to which the observation belongs, is the number of museums registered by the ISTAT survey. Private sites are not considered in the surveys.
- *Nights_Tot (nights)* is the number of nights spent in total in hotels and facilities in a specific year in the province considered. The value is the sum of Italian and foreign visitors.
- *Authority* is a dummy variable equal to 0 if the decision-maker is a “national” authority, like MIBACT, MIT or the government, or a local authority, like the province or the region. The assumption is that a local authority, in its decision-making process, should be ruled by better information of the needs and capabilities for local employment and local income generation much better than a national authority.

And finally response variables are the following:

- *Empl_tot* is the aggregate level of employment in the province and the year to which the observation belongs. Data are from ISTAT surveys and expressed in units.
- *Empl_gi* is the aggregate level of employment, in the province and the year to which the observation belongs, in the macro area of business, hotels and hospitality. Data are from ISTAT surveys and expressed in units.²¹

¹⁷ Section i in ATECO 2007 classification

¹⁸ Section r of ATECO 2007 classification

¹⁹ Section r of ATECO 2007 classification

²⁰ Section i of ATECO 2007 classification

²¹ Section g-i of ATECO 2007 classification

- Dep_i is the total number of dependent workers, for the year and the province to which the observation belongs, in the sector of hotels and hospitality (sector i in ATECO 2007 classification). Data are from INPS statistical Observatories's surveys and expressed in units.
- Dep_r is the total number of dependent workers, for the year and the province to which the observation belongs, in the sector of hotels and hospitality (sector r in ATECO 2007 classification). Data are from INPS statistical Observatories's surveys and expressed in units

5 Results

The parameter estimates are presented in the following tables. The data consists of 590 independent observations from 59 provinces in the period from 2008 and 2017, where every observation is the performance of each province for each year. The observations are independent because only one province is able to receive the CH award. The reduction to 59 provinces is due to the technical need, inherent to the specific model, to have a strongly balanced dataset, with no possibility to include units (provinces) with no data for each of the ten considered years (2008-2017).

The included provinces are the following:

- Torino, Cuneo, Alessandria
- Varese, Milano, Bergamo, Brescia, Pavia, Mantova
- Bolzano, Trento
- Verona, Vicenza, Treviso, Venezia, Padova
- Udine
- Parma, Bologna, Ferrara, Ravenna, Forlì-Cesena
- Pesaro e Urbino, Ancona
- Massa Carrara, Lucca, Firenze, Pisa, Arezzo, Siena
- Perugia
- Viterbo, Roma, Latina, Frosinone
- Caserta, Napoli, Salerno
- Foggia, Bari, Taranto, Lecce, Barletta-Andria-Trani
- Potenza, Matera
- Cosenza, Catanzaro, Reggio di Calabria, Crotone, Vibo Valentia
- Trapani, Palermo, Messina, Agrigento, Caltanissetta, Enna, Catania, Ragusa, Siracusa

The list contains those provinces for which cultural and artistic heritage has an overriding importance, attracting tourism and investment, as well as the sites in which traditionally investment have been directed (southern Italy): for each of the ten years at least a contract exists.

The most appealing provinces are thus covered by the analysis. But since a spatial model has the advantage to correct the response variable from the spatial autoregression (that can be interpreted as its variability due just to the bigger or smaller Euclidean distance between the geographic "points" to which observations belong) a larger area of bordering provinces would make the analysis more complete.

Coefficients ρ and λ in regression's output represent autocorrelation's coefficients, for the response variable and for the error term. A significant coefficient witnesses the existence of autocorrelation.

First of all, it's important to clarify the determinants of the assignation of the funds; a part from their impact, is there a rationality behind the amount of funds that each province receives over the years?

$$\begin{aligned} \text{Award}_{i,t} = & \beta_0 + \beta_{i1} \text{ i.years} + \beta_2 * \text{population}_{i,t} + \beta_3 * \text{NumberMuseums}_{i,t} + \beta_4 * \text{unesco}_i + \\ & \beta_5 * \text{CVA_GExposed}_{i,t} + \beta_6 * \text{CVA_GConserved}_{i,t} + \beta_7 * \text{CVA_Surface}_{i,t} + \beta_8 * \text{undeveloped}_{i,t} + \\ & \beta_9 * \text{award}_{i,t-1} + \epsilon_i \end{aligned}$$

(4)

Equation 4 describes the allocation process as a function of its past value and of some local stock-variables as the different CVA indexes, the number of museums and the number of UNESCO sites. A positive and significant coefficient implies a direction of funds to the support and promotion of cultural heritage, but in this case (table 1) one of the few variables with a significant and positive coefficient is the lagged value of investment. Estimation reveals that there is not a particular will or objective in the determination of the amount of funds to assign to a certain territory: the awarding process has a certain regularity and temporal endogeneity, established together with some assignation criteria decided at extra-national level, as the significance of the variable *undeveloped* expresses. The variable is equal to 1 if the province has been classified by European Union as economically undeveloped, together with other territories of other Member States, according to certain parameters. The presence of one or more UNESCO sites, instead seems to act like a brake.

5.1 Analysis by contracting authority

Results from table 2 and 3 show the estimates of the first steps of the panel spatial model, while table 4 presents the results of the second step on total employment.

Column 1 in tables 2, 3 and 4 shows the results of the general formulation, while the column 2-3 the effect of the authority, national or local, allocating resources. Finally, columns 4 and 5 of table 4 analyze the model on a sector-specific measure of employment, the total number of employed, for each province and years, in the aggregate sector of business, hotels and hospitality (sectors g-i in ATECO 2007 classification from ISTAT) and the over total dependent workers (sector I in ATECO 2007 classification, source INPS).

The focus of interest is the effects of the *CH_award* and the *CVA* independent variables, as well as the local variables. Most of the signs in the parameter estimates are as expected.

The estimation process handled a set of independent explanatory variables as continuous or dummies; using dummy variables in the regression analysis for the latter, it is necessary to drop one of them from the model so that it can be used as a reference category. The variable *year*, for example, used to control for time-variability of the response variable, takes year 2008 as reference and expresses time-differences of dependent variables with respect to the base year.

The *year* dummy variables are in general significant (with the exception of year 2009). The signs of the second stage, when significant, are negative, suggesting some erosion effect over the overall period. First stages, in general, reveals the same erosion in the sector of hotels and hospitality (not significant in case of national authorities) but not in the art and entertainment one, that seems to have been interested by an overall growth over years (but not in the local authority' specification).

Concerning the effectiveness of the authority decision, the second hypothesis (H2) tests the principle of subsidiarity and its impact on the implementation of territorial policies. We argued that the organization of local governments is more effective in reconciling the different and conflicting interests of local stakeholders (awarding authority, local firms and communities) or that expenditure assignment to the local authority increases the efficiency of the expenditure and the impact on employment. However, the institutional

arrangements behind the expenditure assignments and the size of the local government may challenge the expected benefits of subsidiarity.

The first-stage regression on the creation of firms the efficiency of the national authority is bigger, also due to the larger amount of funds that it is called to manage with respect to local authorities, despite, for local administration, the objective of economic development and employment (creation of firms and work).

Another aspect concerning the role of the authority in the effectiveness of the awarding is the kind of procedure that the authority uses to assign the fund: testing the effect of an open procedure against a direct award (with no competition), almost in each case where the coefficient is significant an investment assigned with an open procedure gives an additional positive impact on the economic system, intended in this case as development of art and entertainment sector, that is negative in case of a direct award. The hypothesis (H3) argues that the higher the level of competitiveness (open vs. negotiated or direct procedures), the stronger and positive are the effect of CH expenditure on the total employment. The coefficients of all regression models confirm such hypothesis, but with no high significance or impact.

Limiting the model to the employment of restaurants and hotels sector, results are mixed: when applied on overall employment recorded by ISTAT statistics of course sector-specific firms positively influence the creation of sectorial employment, while negative is the impact of firms in the artistic sector (columns 4 of table 4). If the response variable is instead the number of dependent workers registered by the INPS institute (columns 5), both sectors have a positive influence on the change in the number of dependent workers in hotels and hospitality. This specification implies greater ability to detect the direct link between change in the number of firms and change in the number of dependent workers, purged by the existence of collaborations or temporary jobs.

The second hypothesis (H2) uses place-specific or context-specific factors: they're used both in the general specification, as the number of museums or the number of group of visitors, and as instruments and determinants, together with the investment, of the impact of cultural heritage on economy.

Table 2 shows that the relative endowment of Surface dedicated to culture (museums, parks, palaces) is a positive and significant determinant of firms dealing with art and entertainment, in the general specification, confirming theory and expectations, while the world of conservation of cultural heritage (expressed by the index CVA_Conserved), is unable to generate economic activity, apart from in the case of locally-managed funds: if we assume that local authorities are more concerned with the economic and social development of the territory and with the maintenance of its cultural identity, more than with the achievement of results in touristic sector, conservation can be for sure one of the core economic activities in which allocating efforts and resources.

5.2 Territorial analysis

Columns 2-5 of tables 5,6 and 7 represent instead the application of the model limited to the five macro-regions in which national surface is traditionally divided (north west, north east, central Italy, south and Islands). The five clusters are characterized by a certain degree of climatic, geographical, historical but mostly socio-economical homogeneity, while maintaining some internal heterogeneity. The lost, in some cases, of country-level results reveals a dispersion of the initial centralized action, caused both by differences in the amount of assigned funds but also by specific context in which they must act (relative endowment of cultural heritage, quality and kind of institutions, economic and social development) .

In table 5 and 6, that represent the first stages of the regression, we find that the estimates for **CH expenditure** (*CH_award*, at provincial level) are statistically significant and the lagged variable has a **positive impact** on the creation of sectorial firms, consistently with theory, in the general specification and for central Italy, traditionally a region with a touristic vocation linked to culture. Also, for the sector of hotels and hospitality, in central Italy, as in the Island, the impact of the investment is positive and significant. The finding, when positive and significant, simply confirms the logical path from the funds provided by government (European and national funds of MIBACT) through public contracts and its derivative expected

impact on economy. In the second stage of the regression, on aggregate employment, results are mixed: in general firms created in art and entertainment sector have a positive impact on employment, when significant, a part from in the islands; the opposite happens for the hotels and hospitality sector, with the exception of central Italy. (Table 7). A negative impact may be interpreted as the result that an increase in number of firms doesn't automatically translate into an increase of employment: (temporary contracts, collaborations, external workers, or a simple reduction of employment occurred over the past ten years, that the creation of firms was unable to overturn).

Context and space-specific variables, as CVAs indexes, loose significance if just a microregion at once is considered, while the number of museums has a strong positive influence on total employment in the north east, but not in the south, where public museums don't prove to be an efficient source of employment (Table 7).

When significant, the impact of a fund contracted with an open procedure (Table 5), is positive, while is negative if the procedure is a direct commitment, confirming our hypothesis and the results of previous analysis.

5.3 Period 2014-2017- A further specification

A further specification may limit the observations to the years from 2014 to 2017: from 2013 some changes occurred, the first one purely political and institutional, with a push towards a centralization of the decisional process of assignation and use of the awards, and on the other side the availability of new data (and the consequent possibility to instrument the firms of the artistic and entertainment sector with the number of days worked in that sector the previous year, as in the case of hotels and hospitality sector). In addition, also sector-specific employment for the art and entertainment (*departement* in ATECO 2017) will be used as response variable. Tables from 8 to 13 report the same estimation of previous analysis but referred to the last four years.

In this case, for each specification, since years and the covered area change, more provinces are included in the model via different versions of the weighting matrix. Results are, especially in the first stages, not satisfactory, maybe due to the low number of observations included in each specification. Probably the analysis of a low number of provinces, further decreased by omission (when observation don't exist), makes inefficient and improper the use of a model robust for autocorrelation. Moreover, many of the context-specific variables (as the CVAs) are omitted because time invariant, for data availability, over the four years.

Some goods finding, in any case, exist: for hotels and hospitality sector, the negative impact of the number of firms on employment of the national specification disappears when limiting the observations to the last four years, for a combination a larger and larger flow of investment to manage and the acquisition of the development argument also for central authorities. For art and entertainment, in any case, for local-authorities specification, the objective of economic development and employment (creation of firms and work) is anyway achieved; local administration have maybe a lower impact on the creation of firms, but given a proper management of funds that responds to the objective of jobs creation and development, firms created with funds managed locally have a positive, huge and significant impact on the creation of employment.

6 Tables

Table 1: Determinants of total award – Linear Panel on Total award

Determinants of total award

	award b
2009	0.00000
2010	2428.35745
2011	21987.22574
2012	28765.68498
2013	44089.36675*
2014	55725.49535**
2015	60138.74729***
2016	50466.20321**
2017	29863.53722
pop	0.09551***
museums	524.78061**
unesco	-10035.71541***
CVA_GExposed	-1918.98077
CVA_GConserved	554.55390
CVA_Surface	-1873.57676
undeveloped	38274.30940***
L.award	0.46391***
_cons	-62021.69551***
R-squared	0.59038
N. of cases	787.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 2: Determinants of firms in the sector of art, sport and entertainment – Linear Panel on Total Firms in the art and sport sector – National and by authority (national and local)

First stage estimation on art, sport and entertainment sector - National and by Authority

	firms_r b	f_r_national b	f_r_local b
Main			
2009	25.05503**	11.57155	4.63290
2010	29.16655***	23.24313	9.55234
2011	42.57212***	42.79883**	17.92323
2012	51.93441***	63.83180***	26.39792**
2013	47.93441***	56.14841***	27.32697**
2014	48.77599***	58.70225***	29.07515**
2015	109.79922***	155.73580***	73.31166***
2016	106.87320***	164.49399***	73.78801***
2017	63.32882***	80.64335***	19.99951
pop	-0.00009***	-0.00011***	-0.00007***
museums	-0.01298	0.28825	0.44391
l.award	0.00030***	0.00049***	0.00005
l.direct	-1.39219***	-2.38309***	-0.90029
l.open	-6.34504***	-14.10306***	-2.96972
l.direct*l.award	-0.00000***	-0.00000***	-0.00000
l.open*l.award	0.00001***	0.00003***	0.00001
CVA_Surface	11.21537*	11.26000	-2.32358
CVA_GConserved	3.11642	-3.12348	22.97295*
Spatial			
rho	-0.04739*	-0.14192**	0.06331**
lambda	-0.02207	0.07166	-0.08784**
Variance			
sigma2_e	1737.89726***	2445.26748***	1920.83882***
R-squared	0.13554	0.13234	0.06695
N. of cases	590.00000	230.00000	380.00000

Table 3: Determinants of firms in the sector of hotels and hospitality – Linear Panel on Total Firms in the hotels and hospitality – National and by authority (national and local)

First stage estimation on hotels and hospitality sector - National and by Authority

	firms_i b	f_i_national b	f_i_local b
Main			
2009	-3129.58996*	-4437.71435	-4491.75515**
2010	-3092.39002*	-4466.58946	-4405.59080**
2011	-3041.28086*	-4436.56885	-4324.84977**
2012	-3103.91187*	-4718.19989	-4483.45005**
2013	-3345.58926**	-5192.78506	-4635.67905**
2014	-3444.10984**	-5752.16259	-4661.91775**
2015	-3484.44011**	-5902.71737	-4371.20668**
2016	-1087.40909	1150.33894	-2008.93522
2017	-627.96337	-249.61608	-1785.04248
pop	0.00391***	0.00521*	0.00365*
museums	-30.94845	-21.66082	-83.78738*
l.award	0.00182	0.00674	-0.00779
l.days_i	0.00111***	0.00101*	0.00155***
Spatial			
rho	-0.00634	-0.00092	0.08320**
lambda	0.00194	0.04174	-0.11756**
Variance			
sigma2_e	34275283.59069***	84414516.55837***	47177776.18792***
R-squared	0.28501	0.29129	0.24074
N. of cases	590.00000	230.00000	380.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 4: Determinants of total employment – Linear Panel on Total employment – National, by authority (national and local) and by sector

Second stage estimation on employment - National, by Authority and by sector

	empl_tot b	national b	local b	empl_gi b	dep_i b
Main					
2009	19497.44418***	14426.57662	14629.41858*	-28.42590***	-473.62478
2010	-17569.28543***	-42823.38686***	-4566.89113	4.62383	-1128.94499
2011	-19264.10202***	-44540.60950***	-1565.90950	4.46477	-1793.97133*
2012	-25021.62108***	-55274.05876***	2592.85034	8.60776*	-326.89195
2013	-30019.66596***	-65097.53114***	835.74105	10.75797**	-1220.83056
2014	-29335.03265***	-61476.21038***	1875.30840	12.29125**	-1278.54410
2015	-46612.94778***	-94088.57041***	18223.64398	20.51465***	-4195.45058***
2016	-26427.06867***	-49316.38812***	30621.40289*	-33.94938***	-4720.14551***
2017	-21388.51177***	-52416.07043***	1584.76699	-26.28793***	-2808.27131*
pop	0.02600***	0.02698*	-0.02700*	-0.00005***	-0.00071
museums	24.76704	-25.12494	383.00974**	0.89023***	-28.49658*
firms_r	358.55449***	415.14437***	-230.19985	-0.10299***	59.64420***
firms_i	-6.40764***	-5.38069***	-2.46190**	0.00829***	0.47091**
nights	-0.00093	-0.00362	-0.00107	0.00000	0.00092***
Spatial					
rho	0.02409	-0.01968	0.13222***	0.01065	-0.00361
lambda	-0.06470*	0.01305	-0.17062***	-0.13562*	-0.00418
Variance					
sigma2_e	4.93728e+08***	1.08621e+09***	5.44616e+08***	173.75742***	16371858.34147***
R-squared	0.80376	0.76333	0.73182	0.00816	0.78808
N. of cases	590.00000	230.00000	380.00000	230.00000	590.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 5: Determinants of firms in the sector of art, sport and entertainment – Linear Panel on Total Firms in the art, entertainment and sport sector - National and by Macroregion (North-west, North-east, central, south, islands)

	firms_r b	f_r_northw b	f_r_northe b	f_r_central b	f_r_south b	f_r_island b
Main						
2009	25.05503**	8.14943	-1.47571	12.57519	37.49098*	6.51972
2010	29.16655***	-8.12549	1.81019	6.51111	53.79749**	15.75114
2011	42.57212***	-11.79375	4.01803	32.22084**	63.74526***	19.08792
2012	51.93441***	-5.27756	10.30786	15.47405	107.84637***	26.21955*
2013	47.93441***	-21.42150	9.01881	-6.67050	124.17877***	18.75559
2014	48.77599***	-21.10441	9.15606	-4.38317	143.21546***	17.84190
2015	109.79922***	30.54685	50.80859***	25.33686	204.45315***	38.15606**
2016	106.87320***	17.24668	41.43072***	29.78828*	220.29651***	44.90503**
2017	63.32882***	-65.55313	14.77035	66.73695**	175.81328***	34.66736*
pop	-0.00009***	-0.00007**	-0.00006**	0.00007*	-0.00009***	-0.00005***
museums	-0.01298	1.26808	0.27161	0.28523	0.44314	0.01832
l.award	0.00030***	0.00009	0.00009	0.00054***	-0.00007	0.00005
l.direct	-1.39219***	2.76374	1.21350	-4.00010***	-0.20567	0.00900
l.open	-6.34504***	-16.04009***	-3.79333	-2.99531	-2.26886	0.20624
l.direct*l.award	-0.00000***	-0.00001	-0.00001**	-0.00000	0.00000	-0.00000*
l.open*l.award	0.00001***	0.00008***	0.00003	-0.00003***	0.00001	0.00001**
CVA_Surface	11.21537*	-40.36784	-5.75342	-2.48464	14.02269	-3.76699
CVA_GConserved	3.11642	31.83630	-1.61217	4.26197	-17.93659	25.45185
Spatial						
rho	-0.04739*	0.20648***	0.04032	0.01748	-0.12062**	0.00945
lambda	-0.02207	-0.30686***	-0.11703*	-0.07338	-0.07093	-0.25047***
Variance						
sigma2_e	1737.89726***	1281.36959***	227.73160***	543.13733***	1706.73947***	148.36237***
R-squared	0.13554	0.00481	0.02852	0.81369	0.06604	0.04808
N. of cases	590.00000	90.00000	130.00000	130.00000	150.00000	90.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 6: Determinants of firms in the sector of hotels and hospitality – Linear Panel on Total Firms in the hotels and hospitality sector - National and by Macroregion (North-west, North-east, central, south, islands)

First stage estimation on hotels and hospitality sector - National and by Macroregion

	firms_i b	f_i_northw b	f_i_northe b	f_i_central b	f_i_south b	f_i_island b
Main						
2009	-3129.58996*	-359.07234***	-78.09239*	-6099.62966	-436.94984***	-154.25943***
2010	-3092.39002*	-308.30745**	6.88222	-6159.76293	-337.98599***	-102.57070*
2011	-3041.28086*	-240.42175**	73.54674*	-6662.24620	-225.41085**	-52.98976
2012	-3103.91187*	-144.68399	116.02493**	-7007.83918	-47.95923	30.39419
2013	-3345.58926**	-241.73641*	11.21169	-7990.48934	-47.79111	-26.27149
2014	-3444.10984**	-243.19356*	-65.40881*	-8336.07787	-29.75330	15.20066
2015	-3484.44011**	-192.80019	-39.61943	-8558.80151	68.30772	32.59491
2016	-1087.40909	-139.92792	-2.81379	5462.36671	115.61902	37.89209
2017	-627.96337	-424.18319**	-85.68349	-229.86744	26.86956	96.18376
pop	0.00391***	-0.00023**	-0.00044***	0.01209**	-0.00027***	-0.00007*
museums	-30.94845	-5.49315*	-0.75349	-165.19888*	-4.39913**	0.07357
l.award	0.00182	0.00053	0.00029**	0.00524	0.00021	0.00040***
l.days_i	0.00111***	0.00009***	0.00004***	0.00283**	0.00022***	0.00017***
Spatial						
rho	-0.00634	0.22205***	-0.04548	-0.04279	-0.05346	-0.03261
lambda	0.00194	-0.34053***	-0.09966*	0.05147	-0.12394*	-0.26673***
Variance						
sigma2_e	34275283.59069***	40090.82950***	2906.54893***	1.28828e+08***	26145.39428***	1954.82603***
R-squared	0.28501	0.15946	0.05609	0.34498	0.36702	0.64716
N. of cases	590.00000	90.00000	130.00000	130.00000	150.00000	90.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 7: Determinants of total employment – Linear Panel on Total Employment - National and by Macroregion (North-west, North-east, central, south, islands)

Second stage estimation on employment - National and by Macroregion

	empl_tot b	northwest b	northeast b	central b	south b	island b
Main						
2009	19497.44418***	66574.87839***	-11268.40275***	-5032.79775	7302.87185	6881.33737*
2010	-17569.28543***	-229.05756	-11366.51032***	-4400.91216	-23563.35795**	3046.06630
2011	-19264.10202***	14018.06921	-12004.35268**	-7066.71444	-19192.88208*	4640.23662*
2012	-25021.62108***	26598.88365*	-14088.40119**	-7308.84423	-10585.56610	5546.22064
2013	-30019.66596***	23537.69356*	-14685.20395***	-8285.38987*	-17853.64170	-3123.64657
2014	-29335.03265***	23365.99103*	-9801.21871**	868.19858	-18488.22588	-3405.95720
2015	-46612.94778***	30576.59439*	-11409.20796	-10754.24008**	-19759.23281	5936.66148
2016	-26427.06867***	41401.28513**	-9367.35045	-22213.71347***	-12832.33790	8089.19059
2017	-21388.51177***	8483.87708	-14566.25637*	-20366.46700***	-24585.26338*	8251.05138
pop	0.02600***	-0.04779***	-0.00175	-0.01819***	-0.02512**	-0.00643*
museums	24.76704	-91.44788	177.91787**	-51.00783	-675.91278***	28.12733
firms_r	358.55449***	116.75697	-6.82048	197.18860***	182.86230*	-123.96499*
firms_i	-6.40764***	-86.75745***	37.62115	1.17622***	-70.52380***	-38.26696***
nights	-0.00093	-0.01105	-0.00002	0.00373*	0.00859*	-0.00085
Spatial						
rho	0.02409	0.29404***	0.06462	-0.02362	0.02487	0.01473
lambda	-0.06470*	-0.37133***	-0.15287*	0.02691	-0.03105	-0.16333**
Variance						
sigma2_e	4.93728e+08***	7.13714e+08***	31837116.76414***	73945375.54328***	3.00536e+08***	13892365.23181***
R-squared	0.80376	0.76825	0.25517	0.94764	0.89325	0.87177
N. of cases	590.00000	90.00000	130.00000	130.00000	150.00000	90.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 8: Determinants of firms in the sector of art, sport and entertainment – Linear Panel on Total Firms in the art and sport sector - National, by authority (national and local) and by sector. Years 2014/2017

	firms_r b	f_r_national b	f_r_local b
Main			
2015	9.76059*	19.09389**	11.93988**
2016	6.73149	13.70075*	9.89639*
2017	9.85205*	17.88397*	14.80987**
pop	-0.00001*	-0.00001	-0.00000
museums	0.00000	0.00000	0.00000
l.award	-0.00001	-0.00000	-0.00006*
l.direct	0.23934	0.33683	0.50607
l.open	-0.24463	0.66906	0.98776
l.direct*l.award	-0.00000*	-0.00000	0.00000
l.open*l.award	0.00000*	0.00000	-0.00000
l.days_r	0.00010***	0.00009***	0.00009***
CVA_Surface	0.00000	0.00000	0.00000
CVA_GConserved	0.00000	0.00000	0.00000
Spatial			
rho	0.02296	-0.01479	0.00862
lambda	0.02251	-0.02016	0.05428*
Variance			
sigma2_e	295.75297***	463.40080***	196.38589***
R-squared	0.56548	0.58484	0.63576
N. of cases	292.00000	156.00000	200.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 9: Determinants of firms in the sector of hotels and hospitality – Linear Panel on Total Firms in the hotels and hospitality - National, by authority (national and local) and by sector. Years 2014/2017

First stage estimation on hotels and hospitality sector - National and by Authority 2014-2017

	firms_i b	f_i_national b	f_i_local b
Main			
2015	-3341.28409*	-4885.27446*	-3663.26563**
2016	-1302.97555	-1312.32073	-2401.21615
2017	868.57189	1964.48440	973.00590
pop	0.00634***	0.00783***	0.00606***
museums	0.00000	0.00000	0.00000
l.award	-0.00969**	-0.01287*	-0.00850
l.days_i	0.00179***	0.00199***	0.00125***
Spatial			
rho	-0.00114	0.00015	0.11420***
lambda	0.00249	0.01233	-0.17480***
Variance			
sigma2_e	59765824.28292***	1.09273e+08***	69956526.11065***
R-squared	0.34091	0.34249	0.32572
N. of cases	292.00000	156.00000	200.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 10: Determinants of total employment – Linear Panel on Total Employment - National, by authority (national and local) and by sector. Years 2014/2017

Second stage estimation on employment - National, by Authority and by sector 2014-2017

	empl_tot b	national b	local b	empl_gi b	dep_i b	dep_r b
Main						
2015	-1381.78202	-3403.07154*	-767.76285	-1945.94221***	-467.19290***	-16.85918
2016	1339.40012	2739.74468	827.91980	-1334.41671*	-71.43139	-28.90763
2017	-5636.98863***	-2361.96481	-6522.47416**	-4065.77035***	343.09694	23.13307
pop	-0.01310***	-0.01606***	-0.01007***	-0.00433***	-0.00212***	-0.00037***
museums	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
firms_r	42.12387*	36.93369	87.91204**	56.22923***	21.19770***	3.76867***
firms_i	0.32991	0.63242**	-0.16640	-0.03686	0.04378	0.01131
nights	0.00213***	-0.00135*	0.00268***	0.00028	0.00040***	-0.00009***
Spatial						
rho	0.05619*	-0.09624	0.01498	0.05500*	0.01153	-0.15573***
lambda	-0.12108***	0.14676*	-0.02322	-0.09407*	0.03757	0.16772***
Variance						
sigma2_e	38783817.90998***	31098124.82740***	53536870.29905***	15231091.12587***	463541.13679***	36954.01597***
R-squared	0.33136	0.01885	0.53459	0.81215	0.81301	0.36210
N. of cases	292.00000	156.00000	200.00000	292.00000	292.00000	292.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 11: Determinants of firms in the sector of art, sport and entertainment – Linear Panel on Total Firms in the art and sport sector - National and by Macroregion (North-west, North-east, central, south, islands). Years 2014/2017

First stage estimation on art, sport and entertainment sector - National and by Macroregion 2014-2017

	firms_r b	f_r_northw b	f_r_northe b	f_r_central b	f_r_south b	f_r_island b
Main						
2015	9.76059*	24.15965***	11.98880	18.09550***	34.43621*	-9.90213*
2016	6.73149	8.26416*	13.13873	13.35734**	37.20518*	-5.86749
2017	9.85205*	13.08833*	7.02973	33.23545***	55.75311***	-2.86473
pop	-0.00001*	-0.00001***	-0.00002	0.00003*	0.00000	0.00000
museums	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
l.award	-0.00001	-0.00007	0.00010	-0.00004	-0.00009	-0.00004
l.direct	0.23934	2.96140***	-1.45222*	0.50908	0.34749	2.01643***
l.open	-0.24463	-5.65891*	-3.47860	-1.98174	1.44328	0.51704
l.direct*l.award	-0.00000*	-0.00001***	0.00000	0.00000	0.00000	-0.00000*
l.open*l.award	0.00000*	0.00002**	0.00001	0.00000	-0.00000	0.00000
l.days_r	0.00010***	0.00010***	0.00005**	0.00009***	0.00020***	0.00005***
CVA_Surface	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CVA_GConserved	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Spatial						
rho	0.02296	-0.04124**	0.10241***	-0.00185	-0.13593**	0.13121***
lambda	0.02251	-0.31413***	-0.20228***	-0.14406*	0.01524	-0.28806***
Variance						
sigma2_e	295.75297***	45.29383***	127.03482***	55.51033***	442.85050***	42.31175***
R-squared	0.56548	0.62633	0.09007	0.84205	0.66566	0.52155
N. of cases	292.00000	48.00000	72.00000	56.00000	68.00000	48.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 12: Determinants of firms in the sector of hotels and hospitality – Linear Panel on Total Firms in the hotels and hospitality- National and by Macroregion (North-west, North-east, central, south, islands). Years 2014/2017

First stage estimation on hotels and hospitality sector - National and by Macroregion 2014-2017

	firms_i b	f_i_northw b	f_i_northe b	f_i_central b	f_i_south b	f_i_island b
Main						
2015	-3341.28409*	-78.37704**	-22.28140	-10093.02411*	12.80859	-41.20171*
2016	-1302.97555	-12.41180	15.61260	-2036.35161	75.09241**	-5.32380
2017	868.57189	76.44402	34.41210	-14179.53135**	127.14705***	28.00691
pop	0.00634***	-0.00015***	-0.00029***	-0.01231	-0.00010***	-0.00002
museums	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
l.award	-0.00969**	-0.00004	0.00006	-0.10285***	-0.00010*	-0.00001
l.days_i	0.00179***	0.00004***	0.00001**	0.00864***	0.00007***	0.00006***
Spatial						
rho	-0.00114	-0.04401	-0.00815	-0.00099	-0.08060**	0.05303
lambda	0.00249	-0.00292	-0.09526	-0.07095	-0.04956	-0.21424***
Variance						
sigma2_e	59765824.28292***	3778.24236***	910.48726***	1.56640e+08***	1924.20911***	1092.19398***
R-squared	0.34091	0.16461	0.00018	0.16443	0.23001	0.39935
N. of cases	292.00000	48.00000	72.00000	56.00000	68.00000	48.00000

* p<0.05, ** p<0.01, *** p<0.001

Table 13: Determinants of total employment – Linear Panel on Total Employment - National and by Macroregion (North-west, North-east, central, south, islands). Years 2014/2017

Second stage estimation on employment - National and by Macroregion 2014-2017

	empl_tot b	northwest b	northeast b	central b	south b	island b
Main						
2015	-1381.78202	-5016.80576**	-130.31905	280.10149	-3040.84059*	556.83028
2016	1339.40012	1065.15965	5305.03233	1999.80634	-1913.51624	1535.78267
2017	-5636.98863***	-4040.52308	-5893.15906	-4979.40153**	-7382.88186***	-9237.82949***
pop	-0.01310***	-0.00171	0.02007	-0.01660***	0.00290	-0.01004***
museums	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
firms_r	42.12387*	56.28673	-208.00249*	9.82198	-176.07019	33.36142
firms_i	0.32991	56.34842**	149.99453***	0.15516	96.38212*	6.48813
nights	0.00213***	-0.00887**	-0.00122*	-0.00155	0.00492	0.01236***
Spatial						
rho	0.05619*	-0.02565	0.02783	0.06173	0.11774***	0.08829**
lambda	-0.12108***	-0.19881*	-0.08732	-0.13170	-0.20891***	-0.25665***
Variance						
sigma2_e	38783817.90998***	20054528.10700***	17218518.33651***	22500806.01037***	14853104.76520***	15090280.43171***
R-squared	0.33136	0.91408	0.29026	0.78107	0.79467	0.60159
N. of cases	292.00000	48.00000	72.00000	56.00000	68.00000	48.00000

* p<0.05, ** p<0.01, *** p<0.001

7 Conclusions

In conclusion data confirm the main hypothesis of a positive effect of investment in culture on employment at local level, under some circumstances.

While some results produced in this paper are largely statistically significant with a high adjusted R2 value, there are some key-ways in which our regression estimates could have been improved, maybe comparing other spatial methodologies robust to different hypothesis about the quality of data. Of course, the impact of investment on economic variables can be described using many more channels and determinants, but data, especially at local aggregate level (using “provincia” as unit of analysis), are often not easily available, or, when available, cover just a part of reality (as in the case of private museums, not censused by ISTAT surveys). In other cases, is not possible to unbundle our variable of interest from bigger aggregates, as in case of sector r in ATECO 2007 classification, that includes also the world of sport and entertainment. Also, the number of nights spent in hotels and similar structures is just a proxy and not a real measure of the number of tourists or even better of visitors of cultural sites for a specific province. Links and relationship can result “dirty” by this kind of issues.

The impact on employment is in any case small, confirming that other reasons lie behind the contribution to support the employment at local level. If on one hand local authorities seems to be guided by an economic, or better a support and development argument, the increasingly centralization process and the low amount of managing funds makes the job harder. Moreover, apart from reasons concerning the average size of investment and expenditures, there are other outcomes that should be considered as stated in the Code of Cultural Heritage and Landscape (Ld n.42 of 22 January 2004. In the Code the balance between the two concepts of “tutela” (safeguard) and “valorizzazione” “enhancement” has **shifted** the policy priorities to the former because it explicitly states that “the private sector is obligated to preserve the cultural heritage” while guaranteeing a suitable enhancement of the cultural heritage.

The empirical analysis allows to make a number of conclusions on the impact of public funding of cultural facilities, through national or European programs on potential attraction or areas, rather than by expensive and often not effective (for example, in controlling the public funds distribution) projects.

Some satisfactory conclusions have been achieved in terms of both detecting the behavior and measuring the efficiency of action of the different kinds of contracting authority, and for the robust and expected results in terms of efficiency and implications of an open vs direct procedure for the assignation of the funds.

The partially non- satisfactory results of context-specific indicators may suggest that quantitative indicators of culture (as the number or the size of Museums, or the number of tourists) are not appropriate to measure the impact on employment and a driver of development. It can be explained by the high cost of restoration and conservation of cultural programmes or by the low level of relationship between culture and heritage and the real labor productivity in the traditional cultural industries or decentralized or less densely populated areas of the country.

It is obvious that the potential of the cultural heritage as an instrumental stimulus for the national economy will be realized in the long run, but the high heterogeneity of analyzed investment contracts, with significant differences in size and quality or attractiveness, require further investigation and qualitative criteria or indicators interpreting the features of the outcome of the public expenditure, the local effect and spillovers as well as the interaction on the socio-economic characteristics for the territory,

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