HAS CULTURAL HERITAGE MONETARY VALUE AN IMPACT ON VISITS? AN ASSESSMENT USING ITALIAN OFFICIAL DATA

Calogero Guccio
Anna Mignosa
Domenico Lisi
Ilde Rizzo

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Calogero Guccio, Domenico Lisi*, Anna Mignosa, Ilde Rizzo

University of Catania – Dept. of Economics and Business, Italy

Abstract

In this paper we try to investigate which factors affect the visits to Cultural Heritage (CH), using Italy as a case study. We adopt a broad definition of CH including archaeological and historical sites, historical buildings and, also, museums, focusing our attention on State CH. In our empirical analysis we use a rather innovative indicator of CH value, i.e. the monetary value of State CH, officially provided by the Ministry of Economy and Finance. Using these data, this paper aims at evaluating if such monetary value has a significant role in stimulating visits to cultural sites for the years 1996-2010. We also control for other factors potentially affecting the number of visits to cultural sites, such as alternative tourist attractors and the regional performance in the tourism sector. To the best of our knowledge, this is the first study that attempts to investigate the effect of CH monetary value on cultural participation.

Keywords: cultural heritage, monetary value, cultural visitors, tourist arrivals.

JEL codes: Z11, Z18, Z32.

* Corresponding author: Department of Economics and Business, University of Catania, Corso Italia 55, 95129 Catania, Italy, e-mail address: domenico.lisi@unict.it.
1. Introduction

In this paper we aim to investigate what factors affect the visits to Cultural Heritage (CH), using Italy as a case study. We adopt a broad definition of CH including archaeological and historical sites, historical buildings and, also, museums, focusing our attention on State CH. More precisely, we try to assess whether the quality of CH has a role in stimulating visits, and we also control for other factors, which potentially affect the number of visits to CH, such as the presence of alternative tourist attractors and the regional performance in the tourism sector.

The above issues are closely related and, in analysing them, useful insights come both from the extensive literature on cultural participation and on cultural tourism however ‘elusive’ the definition of cultural tourism is (Guccio et al., 2017; Richards, 1996). In the economic literature the interest for the investigation of the determinants of individual and social demand for CH is quite widespread from a theoretical as well as an empirical point of view (Ateca-Amestoy, 2013; Gil and Ritchie, 2009; Johnson and Thomas, 1992; Luksetich and Partridge, 1997). We address this issue from a specific empirical perspective: we focus on physical visits, leaving aside other forms of fruition such as the ‘virtual’ ones (Navarrete, 2013). Moreover, unlike most of the literature on culture participation (Ateca-Amestoy and Prieto-Rodriguez, 2013), we do not use survey data from CH visitors to investigate the role
of individual features of cultural consumers, but we rather pay attention to the effects exerted by the quality of CH and of the surrounding environment.

A peculiar and innovative feature of this paper is the variable we use to capture the quality of CH. We employ the monetary value of State movable CH, officially provided by the State General Accounting Department (Ragioneria Generale dello Stato – RGS)\(^1\), within the Italian Ministry of Economy and Finance (Ministero dell’Economia e delle Finanze). Though the role of quality to explain museum attendance has been explored in the literature (Luksetich and Partridge, 1997), to the best of our knowledge, this is the first study that employs monetary measures of value to investigate this effect.

A further element capturing our attention is the relationship between visits to CH and the tourism sector. We do not address the debate on whether visiting CH is the main motivation for travelling, or just a collateral motivation (Cellini and Cuccia, 2013; Richards, 2002), we rather try to assess whether visitors, that are attracted by CH quality, are also affected by the efficiency of the tourism sector. More specifically, using a parametric approach, and controlling for stationarity in our data, we assess the role of CH quality to

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\(^1\) RGS is the central control body that supports the Parliament and the Government on budget policies, processes and procedures. It is responsible for the consistency and reliability of national accounts and for the assessment and the analysis of public expenditure trends. For more details, see [http://www.rgs.mef.gov.it/ENGLISH-VE/The-State-/about-us/](http://www.rgs.mef.gov.it/ENGLISH-VE/The-State-/about-us/).
enhance visits to cultural sites. We assess the robustness of our empirical findings using different estimators and, also, controlling for several covariates, such as tourist attractors and the regional performance in the tourism sector. To explore the latter, we use a rather innovative variable, i.e. the DEA efficiency scores computed at regional level for the Italian touristic supply (Cuccia et al., 2016). We find that both the quality of CH and the efficiency of the tourism sector positively affect the number of visits to Italian State CH. Overall, our results are robust to the estimation model and the sample included in the estimation.

The analysis develops as follows: in section 2 a review of the literature on cultural participation and cultural tourism is offered. Section 3 analyses the main features of our case study, i.e. the Italian State CH, and section 4 describes the data and the methodology we use. Section 5 presents the results obtained and, finally, section 6 offers some concluding remarks.

2. Background

There is an extensive literature trying to assess the demand function for culture. Most papers consider demand for performing arts (see, for example, Ateca-Amestoy, 2008; Seaman, 2006), and several studies concentrate on the demand for CH and museums (see, for example, Brida et al., 2011; Fernandez-Blanco and Prieto-Rodriguez, 2004). Fernandez-Blanco and Prieto-Rodriguez (2004) suggest classifying these studies in two groups: one focusing on the

Our study is in line with the second group of studies that focus on the estimation of the demand function (Gil and Ritchie, 2009; Johnson and Thomas, 1992; Luksetich and Partridge, 1997). Gil and Ritchie (2009) use a survey to assess the causal relationships between the image of a museum and visitors’ satisfaction: they differentiate between residents and tourists and find the same positive effect on both groups, with differences in the definition of the image of the museum. Luksetich and Partridge (1997), using data from the US 1989 Museum Survey, estimate the demand function considering several socio-demographic indicators (income, age, sex, race, museum membership) to assess the
characteristics of museums visitors. Their results are in line with most studies about cultural attendance (Ateca-Amestoy and Prieto-Rodriguez, 2013; Seaman, 2006): low elasticity of demand, lower museum attendance among minorities, possibility to use increased revenues from admission fees to enhance quality and stimulate new visitors to enter museums. However, Luksetich and Partridge (1997) also consider the effect of museum quality, using as explanatory variables five dummies for the museums’ collection value (ranging from $100,000 to more than $1 billion) and the age of the museum. They find a positive association between attendance and their measures of quality.

Similarly to Luksetich and Partridge (1997), in this work we also try to assess the effect of CH quality on visits, focusing on the attractiveness of cultural sites, without considering the socio-demographic characteristics of their ‘users’. The peculiarity of our approach is that we use the monetary value of State CH, officially provided by the Italian Ministry of Finance (RGS, 2012), to indicate the quality of CH and, thus, to explain its capacity to attract visitors. In these respect, our approach differs from most studies within cultural economics that have tried to assess the value of CH and museums.

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2 We employ official data on the number of visits to cultural sites.
3 Several studies have used various methods to assess the value of CH, museums, theatres, etc. either directly asking visitors/participants’ assessment of the value (stated preferences) or inferring it from their behaviour (revealed preferences). For a survey on this issue, see Willis (2014).
In our analysis we also include a series of environmental variables (such as, sea, security, regional tourism sector performance, presence of UNESCO World Heritage sites) related to other aspects that can explain the attractiveness of a specific region for visitors. This last aspect is in line with several other studies on tourism that try to explain the capacity of a tourist destination to attract visitors. Therefore, the inclusion in our empirical analysis of tourists data (tourist arrivals) put this work at the boundary of another strand of research that focuses on the link between tourists and cultural participation (Brida et al., 2016; Cellini and Cuccia, 2013). For instance, using data for visitors in Italian CH sites during the time period 1996-2007, Cellini and Cuccia (2013) find that tourist flows positively affect the number of visits to the Italian CH State institutions. On the opposite standpoint, Di Lascio et al. (2011) look at the attractiveness of art exhibitions for tourists in Italy, finding a positive 1-year lagged effect of Modern art exhibitions on tourism and a positive mild effect of contemporary art exhibitions on the tourist flow when their organization is continuous over time. Thus, they conclude that ‘temporary art exhibitions contribute to increase the tourist flow if they are part of a structural characteristic of a destination’ (Di Lascio et al., 2011: 536). In a similar perspective, Guccio et al. (2017) find that a more cultural friendly environment, including pure cultural and leisure activities, helps tourist destinations to take the most from tourists’ resources by increasing overnight stays of tourists.
3. Italian state cultural heritage: institutions and organization

Italian CH is outstanding and spread out all over the country. CH has always been the ‘core’ of Italian cultural policy, with responsibilities shared between the State and the decentralised levels of government – Regions and Municipalities. The State, through the Ministry for Heritage, Cultural Activities and Tourism (Ministero dei Beni e delle Attività Culturali e del Turismo, MiBACT) is responsible for CH protection and also for the management of several national heritage institutions. These institutions include a rather heterogeneous set of museums as well as archaeological and historical sites, ranging from ‘superstars’ – such as, Pompei or Uffizi – to minor CH with very few visitors.

A close analysis of MiBACT administrative organization is outside the scope of this paper: however, it is useful to note that the management of State CH has been recently reformed. The competences for archaeological and historical sites pertain to techno-

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4 According to MiBACT (2014), in 2011 in Italy there were 4,588 cultural institutions, which were opened to the public: 3,847 museums, 240 archaeological sites and 501 monuments, of which 63.8% in public ownership and 36.2% in private ownership. Overall, these institutions attracted 103,888,764 visitors in 2011.

5 These institutions are 431, of which 202 museums and 229 monuments and archaeological sites. In addition, there are 46 libraries and 100 archives (MiBACT, 2014). The protection and valorisation of CH is regulated by the Heritage and Landscape Code (Codice dei beni culturali e del paesaggio).

6 A detailed description can be found at http://www.beniculturali.it/mibac/export/MiBAC/sito-MiBAC/MenuPrincipale/Ministero/La-struttura-organizzativa/index.html. See also the Country profile in Compedium, http://www.culturalpolicies.net/down/italy_122014.pdf.

7 DPCM 171/2014.
scientific territorial structures (*Soprintendenze*) operating at the peripheral level, respectively, for Antiquities and for Fine Arts and Landscape. Larger museums enjoy special autonomy, while minor ones are grouped and run by Regional Museum Poles (*Poli museali regionali*). These institutions, in terms of visitors as well as of the value of their endowment, constitute the sample of the following analysis.

### 4. Data and methods

#### 4.1 Data sample

The data sample employed for our empirical analysis refers only to State CH, because our indicator of the monetary value of CH is available only for the State. As said before, our research question is whether the monetary value of CH, as captured by the official measure described below, has a role in stimulating visits to cultural sites, after controlling for other factors potentially affecting the number of visitors, such as alternative tourist attractors and the regional performance in the management of the tourism sector.

In our empirical analysis we use a rather innovative indicator of CH value, i.e. the monetary value of State cultural assets, officially provided by the Ministry of Economy and Finance (RGS, 2012) in the State accounting to measure the State patrimony. It is worth noting that we consider only the monetary value of movable assets and, thus, we leave out
immovable heritage. Though questionable, this is a necessary choice, due to the fact that corresponding measures of the monetary value of the immovable heritage are available only at the national level and not at the regional one.

Nonetheless, we believe that our measure still represents a good proxy for the value of CH in Italian regions. In fact, the monetary value of immovable CH accounts for less than 20% of the total State CH value, implying that our indicator of movable heritage captures the largest part of the State CH value (RGS, 2012). In fact, even if some historical or archaeological sites in our sample do not have movable heritage, still it is reasonable to assume that, at the regional level, it should be randomly distributed among Italian regions.\(^8\)

Furthermore, in some specifications in our empirical analysis, we also include the number of UNESCO World Heritage (WH) sites in the region. This number should partially capture the endowment of immovable CH of Italian regions and, thus, the related effects on CH visits in the region. Therefore, we believe that our indicator can be considered a good proxy for the value of State CH to investigate its relationship with the number of cultural visitors.

Moreover, this indicator can be considered a sound measure of the value of CH since it is officially used to evaluate State assets as it is provided by RGS, i.e. the institution responsible for the consistency and reliability of national accounts. Finally, this indicator has

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\(^8\) To control for such an effect, in the next section as robustness check we estimate our models for subsample of regions excluding each region one-by-one.
also the advantage to follow the same methodology for all the Italian regions and, thus, it can be thought to capture reasonably well the differences in CH value (i.e. the source of variation exploited in the empirical estimate) among them. Overall, with the limitations of any proxy, the use of this indicator seems more reliable to test for the attractive power of CH compared to the widespread use of indirect measures based upon the ‘subjective’ valuation of visitors themselves (e.g., Luksetich and Partridge, 1997); in fact, it is not affected by the endogeneity bias of the visitors’ subjective experience.

As already said, the above financial measure is available only for CH owned by the State, and not for CH owned by other public administrations or private owners. This is not very limiting, however, as the State is responsible for superstar museums and archaeological sites and monuments and, overall, ticket-paying visitors in State CH accounts for a considerable part of total CH visitors (MiBACT, 2014). It is worth noting that this indicator of the value of State CH is not available in five Italian regions. They are de facto excluded because of the institutional arrangements that grant them special autonomy in many fields included culture.9 Therefore, our sample covers 17 Italian regions over the period 1996–2010: our dataset is a balanced panel with 255 observations.

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9 For instance, in Sicily all museums, historical and archeological sites belong to the Region and are run by the Regional public administration and, therefore, they are excluded from our sample.
Table 1 provides a concise description of the variables employed in our analysis, along with the corresponding source for each variable. Then, Table 2 displays the descriptive statistics, while Table 3 indicates some specific descriptive statistics at the regional level.

<<Table 1 Variables description>>

The dependent variable in our empirical analysis is the number of ticket-paying visitors to State CH. We use this measure rather than the number of total visitors because not-paying cultural visitors are not accounted in some Regions and, therefore, the total number of visitors would have provided a biased measure. For this reason, even if they are strongly correlated in our dataset ($\rho = 0.95$), to avoid such a bias, we consider only the number of paying cultural visitors as the dependent variable.\textsuperscript{10}

Our key explanatory variable is the above-mentioned monetary value of State movable CH provided by RGS (CULTURAL HERITAGE). As said before, to capture the effects of immovable CH, in a few specifications we employ the number of UNESCO WH sites

\textsuperscript{10} Nonetheless, we have re-run all the estimates in the paper also using the total number of cultural visitors as dependent variable, without any significant change in our results. This is not surprising, given the above-mentioned strong correlation between ticket-paying and not-paying visitors.
Coherently with the time period of the analysis, we consider the cultural sites which had been included in the WHL by 2010.

To control for the effect of the efficiency in the organization of the tourism sector, in our empirical analysis we also include the bias corrected DEA efficiency scores (REGIONAL PERF) estimated by Cuccia et al. (2016)\textsuperscript{12}, as indicator of the regional performance in the management of the tourism sector. In this respect, we wonder whether a higher performance of the tourism sector at the regional level is significantly associated with more cultural visitors in the region. Indeed, this is quite an important issue from the policy perspective of cultural tourism, as it sheds some light on the question if the number of cultural visitors is also affected by the overall efficiency of the tourism sector. To increase the variance of the explanatory variable, we employ the reciprocal of the regional bias-corrected DEA efficiency score, where each efficiency score indicates the relative performance of a regional organization to maximize the return from the tourist sector\textsuperscript{13}. Therefore, a higher value of our indicator means a lower regional performance\textsuperscript{14}.

\footnotesize
\textsuperscript{11} See http://whc.unesco.org.
\textsuperscript{12} Following the analysis developed by Barros et al. (2011) for French tourism destinations, Cuccia et al. (2016) imagine a production process where the regional organization in the tourism sector produces overnight stays as output, with tourist arrivals and accommodation capacity as inputs. Therefore, a region with “… large arrivals for a few bed-nights is ceteris paribus an inefficient destination as it is not able to maximize the return for the tourist services supplied at local level …”.
\textsuperscript{13} For more details, see e.g., Barros et al. (2011) and Cuccia et al. (2016).
\textsuperscript{14} More specifically, Cuccia et al. (2016) employ a Shephard (1970) output-oriented distance function and, consequently, efficiency scores assume values between zero and one. Here, instead, we employ the Farrell
The other explanatory variables are provided by the Italian Institute of Statistics (Istituto Nazionale di Statistica, ISTAT), and their inclusion is based on the previous literature (e.g., Cuccia et al., 2016) and data availability. More precisely, the following variables are used in our regression: number of residents (RESIDENTS) and number of arrivals (ARRIVALS) in each region to account for the potential demand; thefts and robberies per 1,000 inhabitants (THEFT), to capture the effect of an environment with high petty crime in the choice of visiting cultural sites; kilometres of coasts (SEA) in each region, to control for the regional differences in cultural visitors driven by an alternative tourist attractor rather than CH. We also include a linear time trend (TREND) to take into account the time effects on the number of cultural visitors.

<<Table 2 Descriptive statistics>>

The descriptive statistics in Table 2, show high variation in the number of residents as well as in the value of CH, and in the number of cultural visitors and tourist arrivals. This is not surprising, as it is well-know that regions in Italy have very different size in terms of population, and display very different scenarios in terms of CH endowment and tourism flow. 

(1957) output-oriented distance function, that is the reciprocal of Shephard (1970) output-oriented distance function, thus efficiency scores assume values between one and infinity.
In particular, from Figures 1 and 2 (see also Table 3) we can see that regions with the highest value of CH, such as Tuscany, Lazio and Veneto, display also the highest number of cultural visitors. On the other hand, regions as Molise, Liguria and Basilicata, where the value of CH is rather low, tend to have also few cultural visitors.

**Fig. 1.** Number of visitors to State cultural sites in Italian regions (in thousands)
4.2 Empirical specification

In this study we aim to test what factors have a role in explaining the number of visitors to State CH in the Italian regions, with special emphasis on the effect of CH quality, expressed in terms of its monetary value.

Since the available measure of CH value is time-invariant, for the characteristics of our data no attempt is made to establish a causal link among the visitors and the monetary value of CH. Nonetheless, in the following empirical analysis we try to provide a robust evidence of a significant association between them, by controlling for demand factors as well as for
other potentially confounding factors, such as tourism flow, the regional performance in the management of the tourism sector and other environmental variables.

Therefore, the main specification of the empirical model is:

\[
VISITS_{it} = \alpha + \beta CULTURAL\ HERITAGE_i + \gamma WHS_{it} + \sum_{d=1}^{D} \delta_d DEMAND^{d}_{it} + \\
+ \sum_{k=1}^{K} \theta_k X^k_{it} + \mu_t + \epsilon_{it}
\]  

where the dependent variable (VISITS) is the number of visitors to State CH in region \(i\) in year \(t\), and our main variable of interest (CULTURAL HERITAGE) is the monetary value of State movable CH in region \(i\). Among the demand factors, we include the number of residents (RESIDENTS) and the number of arrivals (ARRIVALS) in region \(i\) in year \(t\), which should represent the potential pool of cultural visitors in the region. Then, we also consider the other above-mentioned control variables, such as the DEA efficiency scores in the management of the tourism sector (REGIONAL PERF) in region \(i\) in year \(t\), the number of thefts and robberies (THEFT) in region \(i\) in year \(t\), and the kilometres of beaches (SEA) in region \(i\).\(^{15}\) Finally, to

\(^{15}\) We also tried to include some other control variable in our estimates, such as the kilometers of motorways per 1000 square kilometers and the hectares of protected natural areas in the region. Overall, while the latter appears not significant in explaining the number of visitors, the specifications with the former exhibit always markedly larger standard errors. We suspect that this result emerges because of a strong multicollinearity between the number of residents and the number of kilometers of motorways, which, in fact, in our dataset display a Pearson correlation of 0.86. For this reason, we preferred to keep them out of our estimates.
take into account the time effects on the number of cultural visitors, we include a vector of year-specific fixed effects $\mu_t$ or, alternatively, a linear time trend ($TREND$).  

We estimate different versions of our model, both considering our measure of CH alone and along with the number of WH sites. Specifically, we use a parsimonious strategy, starting from the baseline OLS model with a limited set of explanatory variables to a more efficient GLS with all explanatory variables in [1], in order to provide the most robust evaluation of the relationship between the value of CH and the number of cultural visitors; then, for each specification, we also provide estimates of the elasticity of cultural visitors ($VISIT$) with respect to value of CH ($CULTURAL HERITAGE$). Finally, we provide a robustness check concerning the sample used in our estimates, to test further the robustness of our findings.

As preliminary evidence on the association between cultural visitors and the value of cultural heritage, in Table 4 we report the correlation coefficients between them in our dataset, considering also the number of WH sites as a further proxy for the value of immovable cultural heritage in Italian regions. Not surprisingly, we can see that the number of visitors are highly correlated with our indicators of cultural heritage, both in terms of

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16 Notice that, since our main explanatory variable of interest ($CULTURAL HERITAGE$) is time-invariant, we cannot include fixed effects at the cross-section level, as they clearly would not be identified with the presence of time-invariant covariates. In terms of the specific estimation method, this implies that we cannot estimate model [1] by FE estimator, neither standard time-demeaning nor dummy variable regression.
absolute values (*Pearson correlation*) and in regional rankings (*Spearman’s rank correlation*).

<<Table 4 Correlation between visitors and cultural heritage>>

Before proceeding with the estimation, a preliminary point we need to look at concerns the fact that some of the variables employed in our empirical analysis, if taken as time series are generally considered nonstationary stochastic processes integrated of order one $I(1)$, implying that the standard statistical inference on the estimated coefficients in [1] cannot be considered valid. In particular, Cellini and Cuccia (2013) have shown that, if taken as monthly time series, the number of cultural visitors and tourist arrivals in Italy are nonstationary processes seasonally integrated of order one $I(1)$. In our panel dataset, the presence of the cross-section regional level, of course smoothes the presence of the unit roots; nonetheless, it may or may not be enough to eliminate the problem in our estimates and, therefore, we need to test the presence of unit roots.
Looking at the behaviour of our dependent variable over time in Figure 3, indeed, one might be tempted to conclude that, apart from Lazio and Veneto, the number of cultural visitors at the regional level does not represent a nonstationary process. However, the same range in the axis could significantly frustrate our visual ability to detect nonstationary processes in Figure 3. Therefore, in Table 5 we provide different standard unit root tests for panel data. In particular, all three unit root tests are constructed under the null hypothesis that
the variable tested contains a unit root (Harris and Tzavalis, 1999; Im et al., 2003; Levin et al., 2002). Overall, all three tests tend to reject the null hypothesis of the presence of a unit root in both the number of cultural visitors and tourist arrivals. Therefore, the results of these tests suggest that these variables in our panel dataset can be consistently treated as stationary processes.

<<Table 5 Unit root tests>>

5. Results

In this section we discuss the results of our empirical analysis. As we said before, we use a parsimonious strategy, in order to provide the most robust evaluation of the role of CH value in explaining the number of cultural visitors. More specifically, we start from the baseline OLS with a limited set of explanatory variables; then, since we find, not very surprisingly,

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17 All three tests are an extension in panel data of the standard Augmented Dickey Fuller (ADF) test. The only difference among the three unit root tests is that, while Harris and Tzavalis (1999) and Levin et al. (2002) are slightly more restrictive as they assume that all panels have the same autoregressive parameter, Im et al. (2003) relax this assumption and allows each panel to have its own autoregressive parameter.

18 As recommended by Levin et al. (2002), we have subtracted from each variable tested the cross-sectional mean for each year (the well-known demeaning operation) before conducting the tests, to mitigate the impact of cross-sectional dependence on the results. Nonetheless, we have conducted all the tests also without demeaning the variables getting results fully in line with those in Table 5.
evidence of non-normal residuals, we move to a more efficient GLS for panel data with all explanatory variables in [1].

Table 6 shows the estimation results. In column (1) we estimate a simple OLS regression with only our main explanatory variable of interest, along with the constant and the linear time trend. The coefficient of CULTURAL HERITAGE is positive and significant, suggesting that, on average, an increase of a million euro in the value of CH is associated with about one point five thousand more cultural visitors in the region. Even if informative on the direction of the association, clearly a lot of omitted variable bias is likely to affect the estimate in (1). Therefore, from column (2) on, we add progressively more robustness to our estimate to test whether the significant association between the value of CH and the number of visitors holds when controlling for other factors.

<<Table 6 Determinants of VISITS >>

In column (2) we add the number of residents (RESIDENTS) and tourist arrivals (ARRIVALS), which should represent the potential pool of cultural visitors in the region, i.e. the potential demand. Both demand factors are positive and significant, implying that more residents and tourist arrivals are associated with more cultural visitors. As for tourist arrivals,
our evidence is in line with recent empirical studies in the literature finding that, at least in the Italian context, tourism flows are among the most relevant determinants of visits to cultural sites (Cellini and Cuccia, 2013). Concerning the value of CH, the estimate in (2) confirms the positive and significant association with cultural visitors, even if the magnitude is slightly lower.

Furthermore, in column (3) we add our indicators of regional performance in the management of the tourism sector (REGIONAL PERF) and of petty crimes (THEFT) as well as the kilometres of beaches (SEA) in the region, along with a full set of year-specific fixed effects. As we can see, the positive and significant coefficient of CULTURAL HERITAGE appears robust to the inclusion of these confounding factors and, interestingly, we also find that a higher regional performance in the management of the tourism sector is significantly associated with more cultural visitors in the region.19

However, regression diagnostics for the OLS estimated models in Table 6 provide strong evidence of non-normal residuals.20 Therefore, in the next columns we estimate model

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19 Recall that REGIONAL PERF is based on the Farrell (1957) output-oriented distance function and, consequently, efficiency scores assume values between one and infinity. Therefore, a higher value of our indicator means a lower regional performance, implying that the sign of the coefficient in Table 6 has to be interpreted accordingly.

20 Both the Shapiro-Wilk and Shapiro-Francia tests reject the null hypothesis of normality of the residuals at any level of significance. Similarly, the estimated Kernel shows starkly the non-normality of OLS residuals.
[1] with a more efficient GLS estimator for panel data.\textsuperscript{21, 22} In particular, in column (4) we estimate the same specification (3) with GLS. Still, the coefficient of \textit{CULTURAL HERITAGE} confirms the finding of a positive and significant association with cultural visitors, as well as do the coefficients of demand factors and the regional performance in the tourism sector. In respect to the previous estimates, however, we find that \textit{THEFT} is significant and with the expected sign, saying that a higher level of petty crimes is associated with less cultural visitors in the region; we also find that \textit{SEA} is positive and significant, suggesting that alternative tourist attractors might have spillover effect also on cultural tourism.

A potential drawback of our estimates is that, as we already discussed, our measure of \textit{CH} considers only the movable assets and, thus, it leaves out the immovable heritage. Therefore, in the last two columns in Table 6 we include the number of WHL cultural sites (\textit{WHS}), which should partially capture the extent of the immovable heritage in Italian regions. More specifically, in (5) we estimate the model with \textit{WHS} in place of \textit{CULTURAL HERITAGE}.

\textsuperscript{21} The GLS estimator in Table 6 (Stata command \textit{xtgls}) exploits the OLS residuals heteroskedasticity and autocorrelation AR(1) to transform the model in a FGLS approach, and gets more efficient estimates.

\textsuperscript{22} Since a few authors have argued that standard errors of FGLS panel data estimator are “anticonservative” (e.g., Beck and Katz, 1995), we have also tried to estimate model [1] with linear regression, but with panel-corrected standard errors (Stata command \textit{xtpcse}) robust to heteroskedasticity and autocorrelation across panels, as suggested by the same Beck and Katz (1995). Very comforting for us, we got results fairly in line with GLS estimates in Table 6, even if the parameters are estimated with slightly less precision.
HERITAGE, instead in (6) we include both heritage indicators. Looking at (6), we can see that both coefficients are positive and significant, suggesting that the two indicators of CH are not substitute in explaining the number of cultural visitors; indeed, this is not very surprising, as the two indicators concern the movable and the immovable CH in Italian regions, respectively.

Overall, from our estimated coefficients of CULTURAL HERITAGE in Table 6, we can conclude that, on average, an increase of a million euro in the value of CH is associated with about one thousand more cultural visitors in the region. Then, for each specification, in Table 7 we also provide the estimates of the elasticity of VISITS with respect to CULTURAL HERITAGE, computed at the means of the independent variables. As can be seen from Table 7, the estimated elasticities range from 0.45 in the baseline OLS specification, to 0.23 in the GLS estimate with all explanatory variables, saying that, on average, an increase of 10% in the monetary value of CH from the average endowment in the sample would increase the number of cultural visitors of about 2-4%.

<<Table 7 Elasticities of VISITS >>
Finally, to check whether our results depend crucially on the inclusion of some regions and years in the sample, we re-estimate model (6) excluding all regions and years one-by-one. Therefore, we run many GLS regressions where in each regression we exclude, firstly, one different region and, then, one different year. Indeed, this further robustness check should be especially relevant for the issue of CH, since we have already seen in section 4.1 that the value of CH is not homogeneous across Italian regions. Figure 4 reports the GLS coefficients of CULTURAL HERITAGE, arranged from the smallest to the greatest, from the regional reduced sample; then, Figure 5 reports the GLS coefficients from the yearly reduced sample. As Figures 4 and 5 clearly show, however, our estimates do not depend on the sample included in the estimation, as the coefficient of CULTURAL HERITAGE is always positive and significant.

23 Full regressions are available upon request from the authors.
24 The same evidence is found in respect to the effect of the regional performance in the management of the tourist sector (REGIONAL PERF), for which we find always a negative and significant coefficient regardless the sample included in the estimation.
Fig. 4. Coefficients of CULTURAL HERITAGE from the reduced sample (regions)

Fig. 5. Coefficients of CULTURAL HERITAGE from the reduced sample (years)
Overall, from our estimates we can conclude that we find evidence of a positive and significant association between the monetary value of State CH and the number of cultural visitors, robust to the inclusion of many controlling factors, the estimation model and the sample included in the estimation. Furthermore, we interestingly find a significant association between the regional performance in the management of the tourist sector and the number of cultural visitors. Indeed, from the policy perspective of cultural tourism this evidence would seem quite important as it underlines that cultural visitors are not exclusively due to the value of CH in the region, but there seems to be a significant role for the efficiency of the regional organization in boosting cultural visitors.

6. Concluding remarks

A widespread issue in the literature on cultural tourism concerns the effectiveness of the quality of CH in attracting visitors in the related cultural sites. Exploiting the availability of an official indicator of State CH monetary value in the Italian regions, in this paper we have tried to investigate empirically whether the quality of the CH has a role in stimulating cultural visits. Indeed, this is a peculiar feature of our empirical analysis, as such a monetary measure of CH value is quite uncommon in the literature. Moreover, the Italian context is particularly well-suited to address this question as, on the one hand, Italian CH is among the most remarkable in the world, on the other hand, there is much heterogeneity across Italian regions
in terms of CH endowment and cultural tourism. We have also controlled for the effects of
the performance of the tourism sector on the number of cultural visitors.

From our empirical analysis we find that, after controlling for demand and other
confounding factors, a million euro more of CH is associated with about one thousand more
cultural visitors in the region, robust to the estimation model and the sample included in the
estimation. Our estimates also provide evidence of a significant relationship between the
regional performance in the management of the tourism sector and the number of cultural
visitors.

Even if not conclusive, our study offers a new contribution to the literature on the
determinants of cultural visitors. In particular, the use of an ‘official’ monetary measure of
the value of CH in our analysis, instead of an indirect measure based upon the ‘subjective’
valuation of visitors themselves (e.g., Luksetich and Partridge, 1997), seems a more reliable
way to test the attractive power of CH, as it is not affected by the bias of the visitors’
subjective experience. In this respect, the results provided in our paper appear to complement
and strengthen the previous evidence on the relationship between CH and cultural visitors.
Moreover, our findings on the role of the regional performance of the tourism sector offer
insights from the policy perspective, suggesting that the number of cultural visitors is not
exclusively due to the value of CH in the region but, indeed, there is a significant role for the efficiency of the regional organization in boosting cultural visitors.

To conclude, we believe that in this study we have provided a more reliable and robust evidence of the relation between the quality of CH and cultural visitors, especially thanks to the use of our ‘official’ monetary measure of CH in the Italian regions.

References


conditional efficiency approach”, *Journal of Cultural Economics*, DOI: 10.1007/s10824-017-9295-z.


**TABLES**

**Table 1. Variables description**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISITS</td>
<td>Number of visitors to State museums, historical and archeological sites in the region (in thousands)</td>
<td>MiBACT</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
<td>Source</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>CULTURAL HERITAGE</td>
<td>Monetary value of state movable cultural heritage in the region (in millions euro)</td>
<td>RGS</td>
</tr>
<tr>
<td>RESIDENTS</td>
<td>Number of residents in the region (in thousands)</td>
<td>ISTAT</td>
</tr>
<tr>
<td>ARRIVALS</td>
<td>Number of arrivals in the region (in thousands)</td>
<td>ISTAT</td>
</tr>
<tr>
<td>REGIONAL PERF</td>
<td>DEA efficiency scores on the management of tourist sector in the region (reciprocal)</td>
<td>Cuccia et al. (2016)</td>
</tr>
<tr>
<td>THEFT</td>
<td>Thefts and robberies per thousand inhabitants in the region</td>
<td>ISTAT</td>
</tr>
<tr>
<td>SEA</td>
<td>Number of kilometres of beaches in the region</td>
<td>ISTAT</td>
</tr>
<tr>
<td>TREND</td>
<td>Yearly trend</td>
<td>Our elaboration</td>
</tr>
<tr>
<td>WHS</td>
<td>Number of WHL cultural sites in the region</td>
<td>UNESCO</td>
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</table>

**Table 2. Descriptive statistics**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISITS</td>
<td>864.94</td>
<td>1,484.85</td>
<td>7.47</td>
<td>6,015.99</td>
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<tr>
<td>CULTURAL HERITAGE</td>
<td>261.05</td>
<td>527.14</td>
<td>4.94</td>
<td>2,145.58</td>
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<tr>
<td>RESIDENTS</td>
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<td>2,281.75</td>
<td>315.54</td>
<td>9,600.95</td>
</tr>
<tr>
<td>ARRIVALS</td>
<td>4,245.87</td>
<td>3,790.59</td>
<td>150.01</td>
<td>14,583.51</td>
</tr>
<tr>
<td>REGIONAL PERF</td>
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<td>0.25</td>
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<td>2.08</td>
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<tr>
<td>THEFT</td>
<td>21.49</td>
<td>8.53</td>
<td>6.08</td>
<td>41.94</td>
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<tr>
<td>SEA</td>
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<td>431.58</td>
<td>0</td>
<td>1,731.10</td>
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<tr>
<td>TREND</td>
<td>8</td>
<td>4.33</td>
<td>1</td>
<td>15</td>
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<tr>
<td>WHS</td>
<td>1.94</td>
<td>1.78</td>
<td>0</td>
<td>7</td>
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## Table 3. Descriptive statistics by region (average values)

<table>
<thead>
<tr>
<th>Region</th>
<th>VISITS</th>
<th>CULTURAL HERITAGE</th>
<th>ARRIVALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abruzzo</td>
<td>46.35</td>
<td>43.60</td>
<td>1,351.49</td>
</tr>
<tr>
<td>Basilicata</td>
<td>39.57</td>
<td>18.19</td>
<td>394.82</td>
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<tr>
<td>Calabria</td>
<td>83.01</td>
<td>29.98</td>
<td>1,245.12</td>
</tr>
<tr>
<td>Campania</td>
<td>3,082.22</td>
<td>89.96</td>
<td>4,423.43</td>
</tr>
<tr>
<td>Emilia-Romagna</td>
<td>302.47</td>
<td>984.49</td>
<td>7,742.86</td>
</tr>
<tr>
<td>Friuli-Venezia Giulia</td>
<td>153.99</td>
<td>22.01</td>
<td>1,744.82</td>
</tr>
<tr>
<td>Lazio</td>
<td>4,762.54</td>
<td>341.88</td>
<td>9,311.21</td>
</tr>
<tr>
<td>Liguria</td>
<td>33.38</td>
<td>9.36</td>
<td>3,470.27</td>
</tr>
<tr>
<td>Lombardy</td>
<td>758.36</td>
<td>67.72</td>
<td>9,179.20</td>
</tr>
<tr>
<td>Marche</td>
<td>204.27</td>
<td>115.03</td>
<td>1,990.66</td>
</tr>
<tr>
<td>Molise</td>
<td>10.17</td>
<td>4.94</td>
<td>183.93</td>
</tr>
<tr>
<td>Region</td>
<td>Visitors</td>
<td>Spending</td>
<td>GDP</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Piedmont</td>
<td>343.71</td>
<td>26.07</td>
<td>2,955.77</td>
</tr>
<tr>
<td>Apulia</td>
<td>159.73</td>
<td>146.23</td>
<td>2,258.38</td>
</tr>
<tr>
<td>Sardinia</td>
<td>102.70</td>
<td>38.99</td>
<td>1,926.11</td>
</tr>
<tr>
<td>Tuscany</td>
<td>3,938.87</td>
<td>2,145.58</td>
<td>10,038.59</td>
</tr>
<tr>
<td>Umbria</td>
<td>112.67</td>
<td>5.95</td>
<td>1,887.86</td>
</tr>
<tr>
<td>Veneto</td>
<td>570.03</td>
<td>347.81</td>
<td>12,075.27</td>
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</table>

**Table 4.** Correlation between visitors and cultural heritage

<table>
<thead>
<tr>
<th>Cultural Heritage</th>
<th>Pearson correlation</th>
<th>Spearman’s rank correlation</th>
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<tr>
<td>WHL</td>
<td>0.6793***</td>
<td>0.8054***</td>
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<tr>
<td>CULTURAL HERITAGE</td>
<td>0.5383***</td>
<td>0.7501***</td>
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Note. * significant at 10%, ** significant at 5%, *** significant at 1%.

**Table 5.** Unit root tests

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<th>IPS</th>
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</tr>
<tr>
<td></td>
<td>VISITS</td>
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<td>----------</td>
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<td>----------</td>
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<tr>
<td></td>
<td>0.416</td>
<td>-7.670</td>
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<tr>
<td></td>
<td>(0.013)</td>
<td>(0.000)</td>
</tr>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. All three unit root tests have as the null hypothesis $H_0$ that all panels contain a unit root. Therefore, the $p$-values in brackets are the probability that the specific variable has a unit root.

- Harris and Tzavalis (1999).
- Levin et al. (2002).
- Im et al. (2003).
Table 6. Determinants of VISITS

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
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<tr>
<td></td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
<td>GLS</td>
<td>GLS</td>
<td>GLS</td>
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<tr>
<td>CONSTANT</td>
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</tr>
<tr>
<td></td>
<td>(169.897)**</td>
<td>(177.705)</td>
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<td></td>
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</tr>
<tr>
<td>CULTURAL HERITAGE</td>
<td>1.516</td>
<td>1.111</td>
<td>1.142</td>
<td>0.838</td>
<td>0.949</td>
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</tr>
<tr>
<td></td>
<td>(0.149)***</td>
<td>(0.182)***</td>
<td>(0.192)***</td>
<td>(0.087)***</td>
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<td>(0.042)***</td>
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<tr>
<td>TREND</td>
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<td>5.102</td>
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<td></td>
<td>(18.187)</td>
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<tr>
<td>RESIDENTS</td>
<td>0.170</td>
<td>0.164</td>
<td>0.089</td>
<td>0.035</td>
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<tr>
<td></td>
<td>(0.048)***</td>
<td>(0.050)***</td>
<td>(0.012)***</td>
<td>(0.007)***</td>
<td></td>
<td>(0.005)***</td>
</tr>
<tr>
<td>ARRIVALS</td>
<td>0.065</td>
<td>0.069</td>
<td>0.085</td>
<td>0.155</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.030)***</td>
<td>(0.041)*</td>
<td>(0.008)***</td>
<td>(0.004)***</td>
<td></td>
<td>(0.004)***</td>
</tr>
<tr>
<td>REGIONAL PERF</td>
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<td>-188.532</td>
<td>-195.622</td>
<td>-313.790</td>
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</tr>
<tr>
<td></td>
<td>(198.942)***</td>
<td>(23.949)***</td>
<td>(12.617)***</td>
<td>(11.939)***</td>
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</tr>
<tr>
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<td>-2.385</td>
<td>-0.581</td>
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</tr>
<tr>
<td></td>
<td>(11.441)</td>
<td>(0.599)*</td>
<td>(0.497)***</td>
<td>(0.527)***</td>
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</tr>
<tr>
<td>SEA</td>
<td>0.205</td>
<td>0.257</td>
<td>0.401</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>(0.169)</td>
<td>(0.023)***</td>
<td>(0.015)***</td>
<td>(0.011)***</td>
<td></td>
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<tr>
<td>WHS</td>
<td>90.578</td>
<td>20.457</td>
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<tr>
<td></td>
<td>(6.063)***</td>
<td>(3.562)***</td>
<td></td>
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<tr>
<td>YEAR DUMMIES</td>
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<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
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<td>0.285</td>
<td>0.417</td>
<td>0.555</td>
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</tr>
</tbody>
</table>

Robust standard errors in brackets. * significant at 10%, ** significant at 5%, *** significant at 1%.
Table 7. Elasticities of VISITS $^a$

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CULTURAL HERITAGE</td>
<td>OLS: 0.458 (0.061)<em><strong>, OLS: 0.335 (0.062)</strong></em>, OLS: 0.348 (0.066)<em><strong>, GLS: 0.260 (0.027)</strong></em>, GLS: - (0.013)***, GLS: 0.230</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$Elasticities computed at the means of the independent variables.
Standard errors in brackets. * significant at 10%, ** significant at 5%, *** significant at 1%.