ORIGINAL ARTICLE

The political economy of cultural spending: evidence from Italian cities

Chiara Dalle Nogare · Matteo Maria Galizzi

Abstract We investigate the relationship between Italian municipalities' spending on culture in the 1990s and 2000s and a number of political variables—such as a left/right dummy, an election-year dummy and a term-limit indicator—controlling, among other things, for economic and socio-demographic characteristics of the population, the level of human capital and instruction, proxies of social capital, the extent of private financing of cultural provisions and touristic and artistic relevance. We use a panel-data regression analysis and find that, indeed, some determinants of public expenditures on culture are political. In particular, we identify an electoral cycle in which the incumbent spends less on culture in an election year. This result is robust for variations in the empirical model accounting for both the persistence and spatial interdependence of cultural expenditures by municipalities.

Keywords Public cultural expenditure · Political economy · Local government

JEL Classification H44 · H76 · Z11

1 Introduction

Since the end of the 1970s, after Withers' seminal work on the differences among Australian provinces in subsidies to the arts (Withers 1979), public choice issues have entered the world of cultural economics. Frey and Pommerehne (1990) provide an excellent survey of these early contributions, marking the departure of the discipline from its early uniquely normative approach.

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The political economy of the arts is, however, far from being vastly developed, especially considering the empirical literature.

International comparisons are difficult because of the heterogeneity of classifications in national accounting and the fact that the different levels of government play different roles across countries.[1] Thus, empirical research on the subject using international data is simply non-existent.

Moreover, empirical evidence using a country's central or local government's cultural spending is not so widespread, with the lack of reliable data being the main problem in many national contexts. In the last decade, however, studies investigating the determinants of public spending on culture in a number of countries have appeared, some of which include political and institutional variables.

We focus here on the cultural expenditures of Italian municipal governments, considering the 106 provincial administrative centres (Italy's biggest cities) in the 1998–2005 period as our sample.

Bodo (2006) highlights that about 90% of Italy's public cultural spending is done by two actors: the central government and municipal governments, with the former traditionally spending more, but with municipalities rapidly catching up in recent years in the more restricted fields of performing arts, heritage and contemporary art. In fact, municipalities pay for cities' libraries, they often run their own museums and theatres, and many of them have organised very popular cultural festivals in recent years. We focus on the political determinants of a mayor's cultural spending. In our opinion, Italy is particularly interesting in this respect. In fact, the national specialised press tends to take for granted political influence over cultural policies, but to our knowledge, this issue has never been empirically investigated.

The extensive media exposure of, for instance, the opening of a grand art exhibition should encourage a politician to schedule it before an election. The political left/right dimension should also be relevant, possibly with the left being more prone to spending, as the Italian experience at the central-government level shows (Bodo and Bodo 2007). Finally, the presence of a term-limited mayor might also have an effect on this type of spending, as well as on overall public spending, as highlighted by Besley and Case (1995).

Using a panel-data regression analysis, we regress different measures of public cultural expenditures on the political characteristics of municipal governments, controlling for a number of relevant variables, such as economic and socio-demographic aspects, the level of human capital and instruction, proxies of social capital, the extent of private financing of cultural provisions and touristic and artistic relevance.

Our findings highlight that while controlling for other potential drivers of cultural expenditures, some political determinants are indeed relevant for public cultural spending. Although the political orientation of a mayor does not play a role and the presence of a term-limited mayor is possibly relevant for cultural spending only when it affects overall spending, we find that a peculiar electoral cycle is present in Italian cities: mayors tend to spend less on culture just prior to an election. We interpret these results in the light of the fact that voters in Italy may prefer other

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[1] Eurostat has set up a working group involving a number of European countries to tackle the problem.

types of public expenditures to culture. These results are robust for variations in the empirical model in accounting for both the persistence and spatial interdependence of cultural expenditures of municipalities.

Our work is organised as follows. Section 2 is a survey of recent related empirical works. Section 3 illustrates the variables we consider, while Sect. 4 discusses the data we use. Section 5 presents the model and the econometric techniques, while Sect. 6 shows our results, and Sect. 7 discusses some robustness checks. Finally, Sect. 8 concludes.

2 Political determinants of public spending on culture: a survey

In general, the empirical contributions to the political economy of the arts show evidence of a limited role of politics in cultural spending strategies. However, it may be argued that not all of them base their conclusions on the analysis of large samples and the adoption of robust econometric techniques.

Schulze and Rose (1998) consider the subsidisation of German classical orchestras by local governments in 1994. Their findings are rather surprising: income seems to affect subsidies, though negatively, and education plays no role. The authors also include local government debt in their specification because they argue that higher debt means higher debt service, an outflow competing with support for music. Indeed, the effect of debt turns out to be significantly negative. The left–right dimension is captured by a political variable calculated as the proportion of right seats in the local council. However, the authors do not consider the value of this indicator in 1994, but rather the average for the previous 15 years, arguing that policymakers can only change the status quo at the margin, because of the strength of the musical bureaucracy's lobby. This variable is found to have a significantly positive coefficient. The authors explain that because classical music appeals to a high-income audience, this is consistent with politicians catering to their voters' cultural tastes. However, it may be argued that the small number of observations, the use of simple OLS estimation and the unusual treatment of the dynamics (relegated to the construction of the political variable) make the authors' challenging conclusions indefinite.

Getzner (2002) applies a time-series approach to the analysis of the Austrian central government's cultural spending in the 1967–1998 time span. The author finds expenditures on the arts, income and the ratio between the price level of government consumption and the GDP deflator to be cointegrated. The author estimates an error-correction model (ECM) and finds that income and relative prices (the latter in line with Baumol's cost-disease argument: Baumol and Bowen 1966) have significantly positive coefficient estimates, with the short-term dynamics of income also playing a role. When political variables are included, namely a left–right dummy, a coalition-government dummy and an electoral-cycle variable, they all turn out to be insignificant. However, it may be argued that the first two variables probably changed too little in the period considered by the author for the estimates to be conclusive. Getzner (2004) extends the public choice approach to the analysis of Austrian federal provinces' cultural expenditures, finding that there is neither an

electoral cycle nor a war-of-attrition effect when a coalition is in office. However, at the local level of government, there is some evidence of a partisan cycle, with conservative parties being more prone to spending.

Though not exactly focused on political determinants, Lundberg (2006) is a relevant contribution to the literature of municipal cultural policies, as it makes clear how it is essential to account for possible strategic interactions between neighbouring cities. The author estimates a seemingly unrelated (SUR) model for spatial interaction using maximum-likelihood methods and finds a significantly negative estimated coefficient for cultural expenditures provided by neighbours. This finding suggests that cultural expenditures by contiguous municipalities are strategic substitutes, as residents, by simply travelling, can free ride on contiguous cities' cultural services. The results are not sensitive to changes in the definitions of the spatial weight matrices used in the empirical estimation.

Lewis and Rushton (2007) consider US states' fund allocations for the arts during the years from 1976 to 1999, with nearly 1,200 observations. They run a (state- and time-) fixed-effects panel-data analysis with (the log of) state appropriations as a dependent variable and a number of economic, fiscal, socio-demographic and politico-institutional explanatory variables. Education and unemployment are found to have no impact, while both per capita income and state revenues have significant coefficients, with values close to 1. Voter leftism has a significantly positive impact, while government's leftism has not.[2] The presence of a divided government does not seem to play a role either.

Noonan (2007) investigates the same type of spending in a wider time span (1969–2002) and with a dynamic specification, using Arellano-Bond GMM estimates. The author's findings are quite different with respect to the significance of the political variables. The list of explanatory variables is longer here, with last year's value for the dependent variable having the largest and most significant effect but with revenues, debt, federal targeted transfers and stringency of budgetary rules also playing a role. Education is again found to have no impact, and a higher proportion of both young and old people in the total population seem to cause smaller subsidies to the cultural sector. Private support for the arts appears to have no effect. As for political determinants, evidence is found of an electoral cycle in which there is a slump in appropriations in the first year of a term. The left–right dimension is analysed jointly with the divided government dimension, and a Republican governor is found to spend more than a Democrat only if they both experience divided government.

Werck et al. (2008) focus on spatial patterns as well as political determinants. They run OLS and IV regressions with 304 Flemish municipalities' per capita cultural expenditures in 2002 as a dependent variable and different measures of neighbours' cultural expenditures as independent variables, using economic, fiscal, socio-demographic and political variables as controlling variables. Neighbouring cultural policies do seem to affect (enhance) a council's cultural spending decisions, as do population size, education, the proportion of the population over 65, grants

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[2] The authors do not investigate the correlation, and possibly collinearity, between the two latter variables.

and subsidies from the central government (but not income and unemployment). Politics does not seem to matter: neither does the number of parties in office nor their political orientation reach statistical significance. These findings suggest that at the local level of government, Belgium is not characterised by wars of attrition and ideological polarisation in the field of cultural spending.

3 Dependent and independent variables

The dependent variables in our empirical model are per capita public expenditures on culture. In particular, on the left-hand side, there is either of the following:

1. per capita current spending on culture,
2. per capita current spending on libraries, museums and galleries
3. per capita current spending for other cultural services (e.g. theatres and festivals).

We also consider current cultural expenditures over total current spending.

We disregard capital cultural spending for a number of reasons. First, capital spending is usually decided on over a long time horizon because the restoration or construction of a museum takes time. Second, the series of capital expenditures is likely to exhibit an autocorrelation. These two features make it difficult to draw a direct connection between the level of capital cultural spending in a given year and that year's political context. Finally, but importantly, the quality of the available data on capital expenditures appears to be poor.

In our model, the possible determinants of cultural public spending are the following explanatory variables:

- *GDP*: per capita GDP
- *Unempl*: unemployment rate
- *BFexp*: per capita private expenditures on culture
- *Monument*: relevance of a city in terms of artistic and touristic attractiveness
- *Log Pop:* log of population
- *Oldpop*: proportion of total population over 65
- *Youngpop:* proportion of total population under 15
- *Failmandsch*: percentage of population who have failed to complete mandatory school
- *Cultsociety:* number of cultural clubs and societies in the city
- *Electyear:* dummy variable taking value 1 if the year is an election year
- *Termlimit*: dummy variable taking value 1 in all years of a mayor's last term
- *Leftright*: variable capturing the left-wing orientation of the ruling government, taking values 1 (left), 0.5 (centre) or 0 (right).

We express all variables in terms of euros at constant 2007 prices.

We also estimate a dynamic specification in which the regressors include the lagged value of the dependent variable to account for persistence in the level of public expenditures on culture. Moreover, as the empirical literature suggests the presence of spillover effects in cultural spending (Lundberg, 2006; Werck et al.

2008), we also estimate a series of spatial interdependence models,[3] wherein a new variable, *Neighbexp,* the average cultural spending by neighbouring municipalities, is added.[4]

Almost all local governments included in the sample are coalition governments, such that a 0–1 dummy capturing a government's fragmentation is not fit to assess the role of veto players. Data on the number of parties in the coalitions are available only for some years and some municipalities, thus making the construction of a variable controlling for the number of parties in power infeasible. Moreover, we question whether the construction of such a variable would actually capture coalitions' degree of cohesion. In fact, Dalle Nogare (1997, 2000) observes that the number of coalition members is a poor predictor of a coalition government's probability to spend more than average: indeed, large coalitions often perform fiscal stabilisations.

We expect *GDP* to be positively related to public cultural spending, because of Wagner's Law, and unemployment to have a negative impact, as it increases the likelihood that mayors use the budget for social policy purposes. *Log Pop* may exhibit a negative sign if there are significant fixed costs and economies of scale in the production of cultural services: although larger cities are likely to have higher per capita demand for public spending, public cultural expenditures can in fact increase less than proportionally to the total population.[5] We expect *Monument* and *Cultsociety* to have a positive impact and the education index to have a negative impact. *Oldpopul* and *Youngpopul* may have a positive sign, according to the relevant literature.[6] The political variables' expected sign is positive but only if we assume that what the political economy empirical literature finds for the size of government should also hold for the single components of aggregate public spending.

4 The data

Data on cultural expenditures of all 8,101 Italian municipalities are available from the Italian Home Office, dating back to 1998. In 1999, the Internal Stability Pact came into force. This Pact mirrors the European Stability and Growth Pact and

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[3] We are grateful to one referee for suggesting this important extension of the empirical model.

[4] Aside from stressing the importance of spatial interdependence in cultural spending by Flemish municipalities, Werck et al. (2008) point out that when different levels of government spend on culture, the size of each level's expenditures may be the result of their strategic interaction. Additionally, Lundberg (2006) adopts a similar approach in analysing Swedish data on local-government cultural spending. The lack of data on how central government's spending is allocated geographically makes it impossible to test this hypothesis for Italy.

[5] Most of the literature finds evidence of a positive effect of population on per capita municipal spending on culture: see, for instance, Schulze and Rose (1998) and Werck et al. (2008).

[6] The elderly are likely to support public cultural spending, as they have a low opportunity cost to consume cultural activities (Schulze and Ursprung 2000). On the other hand, although youngsters may be less interested in some cultural activities and children certainly increase the opportunity cost of time for their parents, the arts have often been believed to have a "bequest" value (Bille Hansen 1997; Schulze and Ursprung 2000) that can lead to support for higher public expenditures on culture.

imposes the monitoring of local accounts by central government. We consider the 1998–2005 time span.

We consider 106 Italian municipalities, namely the cities that are provincial administrative centres.[7] These cities have populations between 20,000 and 2.5 million and, in the vast majority of cases, are historic cities with local museums and artistic sites.[8] There are two reasons for focusing on this subsample. First, administrative centres are, with virtually no exception, the most populated towns in their respective areas, and thus, they represent Italy's 'urban contexts'.[9] Second, and more important, these municipalities are politically different from the others. Election candidates for a mayoral position in an administrative centre are almost always members of national parties, and they are selected in view of a possible political career at a higher level. Provincial administrative centres are thus different from smaller and less visible municipalities, where national and very local parties compete and mayors often end their political careers as such.

In the official 'certificati consuntivi' (final budget balances) made available by the Italian Home Office, we consider the headings 'impegni', as these certify expenses that have actually been decided in the year of interest. There are two items of interest: total current cultural spending and current spending on 'Libraries, Museums and Galleries', the only subset of the former that is available. This subset proxies expenditures for heritage and cultural goods, while total cultural spending includes performing arts and other cultural events. In both cases, transfers (i.e. subsidies to other public and private cultural producers) are included.

Confirming Introini and De Benedetto (2007), these data demonstrate considerable variance. In addition, the dynamics are interesting. Per capita total current spending on culture constantly increases until 2003, after which there is no clear trend.[10] Per capita current expenditures on libraries, museums and galleries show a slightly positive trend.

Concerning total current spending, we also calculate net total current cultural spending by subtracting from cultural expenses those inflows imputed to the headings 'Libraries, museums and galleries' and 'Theatres, cultural activities and services', from the same source. These inflows are mainly made up of ticket sales, sponsorships and donations. Net cultural spending characteristics and trends do not substantially differ from those of the gross counterpart.

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[7] The number has slightly varied over time with the institution of new provinces. We have considered the cities that were provincial administrative centres in 1998. Notice that there are two cases in which two distinct cities jointly share the provincial administrative centre (Massa-Carrara, and Pesaro-Urbino). In these cases, we have included both cities in our sample. Thus, our sample consists of 106 cities, while the number of Italian provinces in 1998 was only 104.

[8] More often than not, today's administrative centres identify with the capitals of the small states Italy was divided into before it became a unified country in 1861. This is the main reason why they are so rich in cultural heritage.

[9] This also means more reliable data because the smaller the town, the lower the quality of local governments' budget reports.

[10] Apparently, there was no widespread "Millennium Jubilee effect" on cultural spending at the municipal level. However, there were no major spending cuts after 2000 either, in contrast with what Bodo (2006) finds for central government expenditures on culture.

Political data on Italian municipalities from 1993 to 2006 have been collected by Fabio Padovano for IREF (*Institut de Recherche Economique et Fiscal*). They include electoral dates and results, with a classification of winning parties along the left–right dimension.

In 1993, Parliament passed a law (law no. 81/1993) that changed the rules for the election of mayors in Italy, introducing a majority system in which citizens directly elect mayors.[11] The new rules were first applied in June 1993. The tenure was 4 years, but it was changed to five after 2000. A new feature is also the presence of a two-term limit. The Appendix explains, in detail, our use of the Padovano data.

Political analysts claim that the new law has induced a stronger political competition at the local level, introduced a tighter link between citizens' and mayors' political agendas and enhanced the level of transparency and accountability for local politicians. In the 8 years we consider, the relative majority of cities (45) witnessed at least one change in the left–right dimension, a clear break with respect to the past and possibly the consequence of stronger political competition. The time distributions of the electoral, ideological and term-limit dummies show that there is no particular concentration in any single year. In the case of the electoral dummy, this lack of concentration is because the local elections are staggered.

Following Noonan (2007), an important control variable we consider is private cultural spending. Unfortunately, there are no aggregate data at the local level concerning cultural and artistic activities sponsored by private firms. We have therefore considered only non-profit organisations.

Unlike in a number of other countries, private cultural institutions are relatively new to the Italian context, and they have boomed in the last 15 years. Most of them are foundations, but one should distinguish between the so-called *fondazioni di origine bancaria* (or *fondazioni bancarie*, banking foundations) and the rest. The former originate from a 1990 law whereby government-owned banks were privatised.[12] The 1990 law transferred to banking foundations relevant shares of local, regional and, in a few cases, national banks. Thus, these foundations are, by far, the richest and most active private subjects in financing projects in the areas of health and social assistance and artistic and cultural initiatives. There are 88 banking foundations in total (17 of them spend 80% of aggregate expenditures), and they are mainly concentrated in the northern and central parts of the country (Di Lascio and Segre 2007). They are organised into an association, ACRI, from which we obtained the disaggregated spending data. ACRI has not provided us with the data about the geographical localisation of each banking foundation's cultural expenditures. However, they are usually forced by their own by-laws to spend in the area where the bank operates. We therefore use banking foundations' cultural spending as a proxy for private cultural spending in the cities where they reside. The appendix provides information on how we have addressed the likely case of banking foundations operating in more than one city.

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[11] For municipalities of more than 5,000 inhabitants, in case of no absolute majority of the votes, a ballot vote should take place.

[12] They were privatised in a peculiar way. In fact, they were separated into two entities: the bank itself and a foundation owning the shares of the former but not the power to run it and whose aim was to provide services generically beneficial to the community.

Another important control variable that we introduce is a proxy for the local level of social capital. We decided to measure social capital in a specific dimension in close relationship with the objective of our interest. Thus, we introduced the number of active cultural clubs and societies, as officially reported in each province for each year, to capture, to some extent, not only the level of social activities and interaction but also the possible lobbying pressure on local councils from cultural clubs.

We thought that it was necessary to also introduce some measure of a city's cultural heritage, as this is a proxy for how important tourism and cultural tradition are for the local economy. Moreover, cultural heritage often indicates both a tradition in public patronage and a demand for costly restoration work. The only obvious reference in this respect is the so-called *Carta del Rischio*, which is a project by ICR (Central Institute for Conservation, a branch of the Ministry of Culture) aimed at mapping all Italian municipalities according to the number of monuments and classifying them according to the conservation risks they run. We used the data collected from the first part of this research. The term 'monuments' here refers to museums, historical palaces, churches, fountains and a range of other heritage pieces, regardless of who owns the properties, whether a public or private subject (including the Catholic Church). These data show that, generally, the municipalities in our sample are actually the richest in monuments, which is indeed one of the reasons why we focus on them.

5 The empirical estimation

We estimate both the *fixed-effects* and *random-effects* panel-data models. In particular, y_{it} is denoted by per capita public expenditure on culture by municipality i at time t, x'_{it} is denoted by a set of characteristics of the city considered explanatory variables, β is denoted by a vector of parameters to be estimated, α_i is denoted by the source of unobserved heterogeneity across cities, not necessarily uncorrelated with our set of regressors, and ε_{it} is denoted by the idiosyncratic errors. Then, under the assumption that the linear model

$$y_{it} = x'_{it}\beta + \alpha_i + \varepsilon_{it} \tag{1}$$

satisfies the hypothesis of strict exogeneity, conditional on unobserved heterogeneity, normality, conditional homoscedasticity and the usual rank conditions, we can estimate the model using the *fixed effect*, or the within-group *OLS* (*FE*) estimator, which applies a within-group transformation and which estimates OLS applied to data in deviations from city means. The FE estimator exploits only the variability within the same city and, under the above assumptions, is a consistent and efficient estimator of the parameters. The main advantage of using the FE estimator is that it does not impose any hypothesis about the correlation between the unobserved city heterogeneity α_i and the regressors x_{it}. The main drawback of the model is that because it cancels out all the variables that do not vary over time, it clearly cannot estimate their effects.

We also estimate the panel model using the alternative *random-effect* (RE) estimator. The RE estimator is an OLS estimator applied to the model transformed

through feasible generalised least squares (FGLS), and it combines the information from the variation within the same city (exploited by the FE estimator) and the variation among cities (exploited by the *between-group* estimator, an OLS applied to data in individual means). Under the assumptions of normality, conditional homoscedasticity, the usual rank conditions and the additional hypothesis that the unobserved heterogeneity α_i is not correlated with our set of regressors (strict exogeneity, unconditional on unobserved heterogeneity), the RE estimator is a consistent and efficient estimator of the parameters. The main advantage of the RE estimator is that it allows us to estimate the parameters of the time-invariant variables. The main limitation is clearly its assumption that no correlation exists between the unobserved city heterogeneity α_i and the regressors x_{it}.

When the unobserved city heterogeneity is correlated with the set of regressors, the fixed-effects model is consistent, while the random-effects model is not. The choice of the estimation model thus depends on whether no correlation between the unobserved heterogeneity and the regressors is a good assumption for our case.[13] An argument in favour of the validity of the hypothesis of no correlation between the unobserved heterogeneity and the regressors can be found in the peculiar history of Italy. Since the twelfth century, Italian history has constantly witnessed a central role played by cities. Almost until the relatively recent unification of Italy, in 1861, each major city retained its own independent government and juridical system and developed its own local culture, traditions, social structure and even language. From this perspective, each major Italian city is likely to have evolved along a peculiar pattern and to have developed its own individual character, even within similar socio-economic conditions. There still remain undeniably great differences among Italian cities, even within the same region, and it is very difficult to explain such a wide latent heterogeneity in the light of economic and socio-demographic indicators.

Ultimately, the answer to such questions is an empirical one. To select which model is appropriate, we perform a Hausman test on the difference between the *RE* and *FE* estimates. Statistically significant differences in the estimates reject the hypothesis of no correlation. On the basis of the *F* statistic obtained from the Hausman test, we can accept or reject the null hypothesis that the unobserved city heterogeneity is uncorrelated with the regressors, and therefore, we can select either the *RE* or the *FE* as the preferred model.

We then extend the above linear panel-data models in two directions. First, we explore whether the level of cultural spending by a municipality also depends on its previous expenditures (i.e. persistence over time). Second, we check whether one of its drivers is the level of cultural expenditures by neighbouring municipalities (i.e. spatial interdependence).

To detect persistence in the levels of cultural expenditures, we estimate a dynamic specification of the linear panel-data model of the type

$$y_{it} = \rho y_{it-1} + x'_{it}\beta + \alpha_i + \varepsilon_{it} \tag{2}$$

or, alternatively, $y_{it} = w_{it}\,\gamma + \alpha_i + \varepsilon_{it}$, with $w_{it} = \left(y_{it-1}, x'_{it}\right)$, where y_{it-1} is per capita public expenditures on culture by municipality i at time $t-1$. As strict

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[13] See Wooldridge (2002).

exogeneity is violated because unobserved effects are correlated with lagged-dependent variables, standard panel-data estimators are inconsistent. However, under the assumption that the dynamic model satisfies the hypotheses of consistency, asymptotic normality, conditional homoscedasticity, the absence of an autocorrelation in the idiosyncratic errors and sequential exogeneity (by which once w_{it} and α_i are controlled for, w_{is}, with $s < t$, has no partial effect on y_{it}), we can estimate the model using the *GMM first-difference* estimator proposed by Arellano and Bond (1991). Using a large set of lagged values of y_i and x_i as instruments of the first differences of the model, the *GMM* estimator exploits a number of moment conditions to estimate the unknown parameters by a generalised method of moments procedure. Under the above assumptions, it is a consistent and—depending on the choice of the weights matrix—efficient estimator. The Arellano and Bond estimator is fit to address data sets with many cross-sectional observations and relatively few periods, which is our case.

The presence of permanent positions in the cultural department of a city council organisation is clearly an argument in favour of some attrition in the levels of municipal expenditures. On the other hand, such an argument is more suitable in contexts in which cultural expenditures take mostly the form of investments, such as building museums or libraries or refurbishing monuments. However, as already discussed, we do not consider capital spending here.

We also estimate different versions of the spatial interdependence panel model. The following empirical model can represent the general idea:

$$y_{it} = x_{it}'\beta + \varphi \, \Sigma_{j \neq i} \omega_{ij} y_{jt} + \alpha_i + \varepsilon_{it} \tag{3}$$

where y_{jt} is per capita public spending on culture by municipality j at time t, φ is a parameter for the neighbourhood effect to be estimated and ω_{ij} is a spatial weight attached to each pair of municipalities i and j. We employ the contemporaneous level of per capita public spending on culture by neighbouring municipalities.[14]

Spatial weights take different forms according to the model's specifications. In the simplest version:

$$\omega_{ij} = w_{ij}/(\Sigma_{j \neq i} w_{ij}) \tag{3a}$$

where $w_{ij} = 1$ if provincial administrative areas of municipalities i and j are contiguous, and $w_{ij} = 0$ otherwise.[15] In such a case, the overall neighbourhood effect $\Sigma_{j \neq i} \omega_{ij} y_{jt}$ in Model (3) boils down to the average cultural public expenditure by all municipalities whose provincial areas share a border with the province of municipality i. This simple border-sharing model is quite common in the literature (Baicker 2005; Geys 2006; Werck et al. 2008) and captures the idea that citizens

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[14] Our choice is in line with a common assumption by the empirical literature on local expenditures and tax yardstick competition (see Buettner 2001; Bordignon et al. 2003; Allers and Elhorst 2005; Geys 2006; Werck et al. 2008).

[15] We have constructed the spatial weight matrix beginning with information on the provincial borders available online from Wikipedia and double-checked by direct inspection, using a geographical atlas of Italy, dated year 2000.

living in a municipality may travel to the main neighbouring cities to attend cultural events, but are unlikely to go further.[16]

In a second model, the weight attached to municipality j in the neighbourhood effect on per capita cultural spending of municipality i is computed as:

$$\omega_{ij} = w_{ij}\text{Pop}_j / \left(\Sigma_{j \neq i} w_{ij}\text{Pop}_j\right) \tag{3b}$$

where again, $w_{ij} = 1$ if provincial administrative areas of municipalities i and j are contiguous (and $w_{ij} = 0$ otherwise), and Pop_j is the population in municipality j. In addition, this population-weighted border-sharing model is common in the empirical literature (e.g. Baicker 2005; Werck et al. 2008) as it captures the idea that larger cities' cultural spending can induce less public spending and more 'free riding' by contiguous municipalities.

In the last version of the spatial weight matrices, we account for the fact that cultural events organised by neighbouring municipalities belonging to the same region of city i may exert a stronger effect on public spending on culture by municipality i:

$$\omega_{ij} = d_{ij}^{sr} w_{ij} / \left(\Sigma_{j \neq i} d_{ij}^{sr} w_{ij}\right) \tag{3c}$$

Here, $w_{ij} = 1$ if provincial administrative areas of municipalities i and j are contiguous, $d_{ij}^{sr} = 1$ if municipalities i and j belong to the same region, and $w_{ij} = 0$ and $d_{ij}^{sr} = 0$ otherwise. In such a case, the overall neighbourhood effect $\Sigma_{j \neq i} \omega_{ij} y_{jt}$ in model (3) is the average cultural public expenditure by the municipalities whose provincial areas share a border with the province of municipality i and belong to the same region, and it can be rewritten as $y_{it} = x_{it}'\beta + \phi\Sigma_{j \neq i}\omega_{ij}y_{jt}^{sr} + \varepsilon_{it}$.

In the case of Italy, there are several reasons why it is worthwhile to test whether the neighbourhood effect is stronger within regional boundaries. For instance, one can argue that citizens from one municipality are *more* likely to travel to other cities within the same region.[17] Another reason may simply be the higher likelihood of becoming aware of cultural events scheduled in cities within the same region. With the only exception being major national exhibitions, in fact, cultural events tend to be advertised on regional television and radio stations and newspapers. Finally, cities within the same region are more likely to share homogeneous tastes and preferences for cultural events.[18] Thus, mayors are likely to compare their spending decisions with the ones by contiguous peers that they perceive to be more similar.

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[16] The border-sharing spatial weight matrix is also a common starting point in the literature on local tax yardstick competition: see, for instance, Bordignon et al. (2003), Charlot and Paty (2007) and Bosch and Solè-Ollè (2007).

[17] This phenomenon may result because transports are easier and quicker within than across regions, even when keeping distances fixed and disregarding "natural" borders across regions (such as rivers, lakes, or mountains): in Italy, in fact, local public transport is mostly planned at a regional level, and bus or train services may be less frequent or convenient between cities belonging to different regions.

[18] This phenomenon may be due to a variety of historical, cultural or political reasons and is also reflected by the fact that political variability across cities (for instance, in terms of left–right orientation) tends to be much higher between different regions than within the same region.

Anselin (1988a) proposed the so-called spatial lag model $y = \rho Wy + X\beta + \varepsilon$ (with W being a NxN spatial weight matrix, ρ the spatial autoregressive (SAR) coefficient and ε an independent identically distributed error term with variance σ^2), corresponding to the matrix representation of models (3a–c), and showed that the OLS estimator for this model is both biased and inconsistent.[19] A viable estimation method uses an instrumental variable (IV) approach and consists of finding a set of instruments strongly correlated with the original variables Wy and X but asymptotically uncorrelated with the error term. Such an IV approach typically employs a two-stage least squares (2SLS) method. A first-stage estimation regresses the spatially lagged variables Wy on a fixed set of exogenous instruments, while the second stage estimates the original model with the endogenous spatial explanatory variables replaced by the predicted values obtained from the first-stage regression. Most empirical literature on spatial interaction in public spending employs the IV (2SLS) approach (e.g. Solè-Ollè 2006; Baicker 2005; Geys 2006; Werck et al. 2008; Dubois and Paty 2010), and we have done the same.[20] This IV approach is easy to implement using standard statistical packages and leads to consistent estimates, while its efficiency crucially depends on finding a proper set of exogenous instruments (Anselin 1988a).

6 The empirical results

The main findings of our analysis of Italian municipal spending on culture are summarised in Table 1, where the FE, RE and GMM estimation results are reported.[21]

In the first three columns, the dependent variable is *per capita* gross current cultural expenditures; in the following three columns, it is current cultural spending as a share of total municipal current spending.[22] As can be observed, the different models and estimation strategies produce quite similar outcomes.[23]

Most of the economic and socio-demographic variables do not reach statistical significance. The idea underlying the introduction of the *Cultsociety* variable is that public provision of cultural services may be subject to the lobbying activity of

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[19] The failure of the OLS is due to the "endogeneity" of the spatially lagged variables Wy, which are correlated with the error term: such a correlation occurs irrespectively of the properties of the error term.

[20] We have estimated a spatial lag model beginning from user-written routines publicly available for the statistical software *Stata* (Jeanty 2010a, b, c) to create the above-described spatial weight matrices, run the tests to detect spatial patterns and the appropriate form of spatial interdependence and estimate the panel models with spatial interaction (3a–c) using an IV 2SLS approach.

[21] Concerning the fixed- and random-effects estimates, we have run several specifications adding time effects, but they never produce qualitatively different outcomes. GMM estimates are Arellano-Bond step-1 estimates obtained using the following instruments: all lags of the dependent variable, the political variables and all other variables lagged one period. Notice that Model (5) does not pass the Sargan test; however, by adding a second lag of the dependent variable as a regressor, the test is passed while results are qualitatively similar.

[22] We thank one referee for suggesting inclusion of this dependent variable in our regressions.

[23] For per capita cultural expenditures, the Hausman test on the differences between RE and FE estimates produces *p values* equal to 0.121 for the specification in levels. Thus, the Hausman test points in favour of the RE model. Similar results hold when net cultural spending and expenditures on libraries, museums and galleries are considered.

Table 1 Determinants of Italian municipal cultural spending, 1998–2005

	Gross current cultural expenditure, per capita levels			Gross current cultural expenditure over total current expenditure			Net current cultural expenditure, levels
	FE	GMM	RE	RE	GMM	FE	RE
Dep. Var. $z(-1)$		0.30653*** (0.0000)			0.29567*** (0.0001)		
Gdp	−0.00019 (0.6360)	−0.00049 (0.3558)	0.00007 (0.8258)	2.01E−07 (0.4602)	−5.08E−07 (0.3529)	−7.24E−08 (0.8283)	0.00032 (0.2778)
Unempl.	−0.35159 (0.2147)	0.72671 (0.4729)	−0.05108 (0.8316)	−3.49E−05 (0.8630)	0.00014 (0.8450)	−0.00025 (0.2713)	0.08295 (0.7146)
BFexp	0.10870** (0.0379)	0.71179*** (0.0000)	0.14676*** (0.0015)	6.68E−05* (0.0855)	0.00023** (0.0233)	5.17E−05 (0.2192)	0.13521*** (0.0017)
Monument			8.19159*** (0.0000)	0.00560*** (0.0045)			7.17071*** (0.0000)
Log Pop.	32.17756 (0.3118)	−9.26498 (0.9155)	−2.94449 (0.2679)	−0.00483* (0.0804)	0.02973 (0.6936)	0.06281* (0.0146)	−2.21624 (0.3558)
Oldpopul	−0.03749 (0.9730)	−1.30886 (0.6844)	0.63828 (0.3963)	0.00078 (0.2478)	0.00029 (0.8972)	0.00027 (0.7625)	0.83178 (0.2404)
Youngpopul	0.61166 (0.6675)	−5.94417* (0.0514)	−1.88086* (0.0922)	−0.00031 (0.3406)	0.00046 (0.8818)	0.00104 (0.3653)	−1.48501 (0.1598)
Failmandsch			0.97078 (0.2684)	0.00086 (0.3406)			0.85858 (0.2791)
Cultsociety	0.07298 (0.6701)	−0.19829 (0.5213)	−0.02328 (0.8195)	−1.81E−06 (0.9849)	−0.00025 (0.3039)	6.14E−05 (0.6574)	0.04642 (0.6230)
Electyear	−2.97370** (0.0120)	−4.22140** (0.0340)	−3.05951*** (0.0094)	−0.00267*** (0.0050)	−0.00301*** (0.0050)	−0.00249*** (0.0092)	−2.90761*** (0.0094)
Termlimit	−2.16316* (0.0696)	−8.90058 (0.1628)	−1.67472 (0.1471)	−0.00067 (0.4738)	−0.00508 (0.1879)	−0.00102 (0.2869)	−1.37566 (0.2063)
Leftright	0.14290 (0.9320)	9.13670 (0.1357)	0.87194 (0.5786)	−0.00061 (0.6368)	0.00677 (0.1624)	−0.00114 (0.3971)	0.88560 (0.5574)
Centre-North			17.69252*** (0.0030)	0.01936*** (0.0014)			14.18323*** (0.0087)
No. of obs	800	581	800	795	575	795	782
Cities	106	106	106	106	106	106	106
Rsquare	0.8182		0.4483	0.3497		0.8508	0.4631
Sargan test		0.2288			0.0438		

cultural organisations. However, our econometric analysis does not seem to support this view, as the coefficient associated with *Cultsociety* is never significant. This result may have occurred because Italian cities tend to privilege in-house production of cultural services instead of their externalisation. An alternative explanation is that our variable is quite a generic proxy for the number and strength of cities' cultural clubs. A similar problem may affect the per capita GDP and unemployment variables,[24] as these refer to the provinces, not their administrative centres.[25] In addition, population does not seem to play a role. This lack of an effect may result because a relatively large number of Italian cities are famous tourist attractions, and their cultural services are therefore scaled to a much larger audience than the city's population.[26] This explanation may also clarify why the proxy for a city's human capital is never significant. The coefficient of *Youngpop* is more often significant than the one associated with *Oldpop,* but it rarely reaches full significance.

Instead, the North-Centre dummy, capturing the North–South divide of the country, is highly significant and with the expected sign. The effect of the presence of cultural heritage captured by *Monument* is also significantly positive.[27] Arguably, this result is partly because if, for instance, a museum is present, it has to be run, whereas if there is no museum at all, there is no corresponding expenditure. Yet this explanation neglects the consideration that maintaining a museum, as well as deciding to open a new one, is a political decision, and this is true for all excludable monuments. Therefore, our result suggests that wherever artistic heritage is potentially a factor of development, local policymakers seem eager to exploit it.

The significance of cultural expenditures by banking foundations is striking and deserves special attention. Most banking foundations mainly operate as grant-makers, and the object of their transfers is often public authorities and local councils. Therefore, the sum of two phenomena is presented here:

(a) When a transfer is meant to sponsor, for instance, an exhibition at a museum owned by the city council, it enters the municipal balance sheets as an outflow as well as an inflow.[28]

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[24] Notice that the lack of significance of the GDP variable on the level of municipal cultural spending is not completely new to the literature; for instance, Lundberg (2006) found a negative effect of average income on cultural expenditures in Sweden but observed that its significance varied over time, leading him to believe a conclusion could not easily be drawn on its effect. Also Werck et al. (2008) found a negative but not statistically significant effect of income level on public cultural spending by Flemish municipalities.

[25] There is no systematic collection of data on municipal GDP and unemployment in Italy. Notice also that GDP may influence cultural spending in two ways: by enhancing the demand for cultural services and by increasing the tax base on which local authorities can rely to finance their services. In Italy, however, transfers from the central government still constitute the lion's share of municipal inflows in the period herein considered.

[26] Log Pop is sometimes significant and negative when the number of hotels is included as an explanatory variable; see par. 7.

[27] We cannot use *Monument* (and also *Failmandsch*) in the FE and GMM estimates because, for every city, they are constant over time.

[28] In the vast majority of cases, public museums and galleries are not separate accounting units in Italy.

(b)   When the exhibition might occur only because of a generous contribution by the banking foundation, it is likely that the city council organises the cultural event and contributes some additional money. The alternative scenario would be one in which municipal spending becomes smaller when private institutions' transfers become greater.

In the last column of Table 1, Model (3) is replicated, but we substitute gross current cultural expenditures with their net counterpart. Banking foundation contributions to city budgets are subtracted from the dependent variable here, and thus, the sign of the estimated coefficient of private spending may be read as a clearer indicator of either complementarity or substitutability. One can confidently report that there is a positive impact of private cultural spending on the amount of resources coming from taxpayers that municipal councils use to finance cultural activities.[29]

Focusing now on the political determinants of cultural spending, there is one clear conclusion to be drawn from Table 1: the electoral timing *does* matter for determining cultural spending. The other two political dummies do not seem to play any role.

That the left–right dimension plays no role is surprising, though empirical works focusing on Belgium find similar results. It may be the consequence of the use of a discrete, almost dichotomous variable as a proxy for a continuous one: as highlighted in the literature, this introduces measurement errors that give rise to significant attenuation bias. A possible alternative explanation is that, as a number of Italian political analysts claim, the left–right divide is less clear-cut at a local level after the electoral reform. As Bodo and Bodo (2007) claim, while at the central-government level, left- and right-wing parties produce different cultural policies (the left being more prone to spending), at the local level, parties tend to compete less on ideological issues and more on the quality of their candidates as potentially efficient administrators.

As for the *Termlimit* variable, there is no clear indication in the literature regarding which sign its coefficient should show.[30] However, some political economy studies point out that because elections have no disciplinary role for a '*lame duck*', the latter is more prone to deviate from the median voter's preferences (Besley and Case 2003; Smart and Sturm 2006). Here, the estimated coefficient of the *termlimit* variable is sometimes marginally significant and negative, but it is never so when the dependent variable is cultural spending over total current spending. In fact, by checking the relationship between total municipal current spending and the political dummies, it turns out that *Termlimit* is the only significant (and negative) driver.

Therefore, the results here seem to suggest that a term-limited mayor may spend less on culture, but he actually spends less on all items, possibly because of a desire to leave a sound financial situation to his or her successor.

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[29] Using net current cultural spending instead of gross cultural spending rarely makes any difference in our analysis.

[30] For an extensive survey of both the political and economic literature on term limits, see Lopez (2003).

Table 2 Determinants of Italian municipal spending, 1998–2005 (controls omitted)

	FE	RE
Electyear1	−7.68006 (0.4229)	−6.52056 (0.4948)
Termlimit	−33.11292*** (0.0005)	−34.02382*** (0.0003)
Leftright	20.52111 (0.1325)	24.00819* (0.0645)
R^2	0.8227	0.2849

However, the most striking result is the *negative* sign of the election-year dummy. Notice also its strong significance and relatively high value in the first three columns: it implies a fall of about 10% in average cultural expenditures. This finding is in contrast to a vast empirical literature on the effect of elections on government spending (Alesina et al. 1997) and has no equivalent in the literature focusing on cultural spending. Our result is quite robust: we have run a large number of reduced models, dropping insignificant variables one at a time, and the significantly negative coefficient of *Electyear* is confirmed by all of them. As shown in Table 2, total current spending per capita seems to be unaffected by the electoral timing; on the contrary, when we consider cultural spending over total spending, the negative sign of the election-year dummy is again apparent. This finding is evidence of the fact that elections determine a change in the *composition* of municipal spending in Italy: mayors tend to shift resources away from culture just before an election and use them for other purposes. However, why should they? The only possible explanation is that by doing so, they believe their chances of re-election will be greater. This finding, in turn, is a clear sign that the Italian median voter does not evaluate culture very highly.

In Table 3, we consider the spending subcategories 'Libraries, museums and galleries', on the one hand, and 'Theatres and other cultural activities and services' (derived as the difference between total cultural spending and the first subcategory) on the other.

Concerning the non-political variables, little changes with respect to Table 1. In the dynamic model, expenditures on libraries, museums and galleries show a stronger dependence on the previous year's value; this finding is consistent with the fact that the cultural activities in the second spending category include events, such as festivals and street parades, which usually imply a smaller permanent staff. As for the political variables, election years represent the lion's share here as well, but notice the difference in magnitude between libraries, museums and galleries spending and its complement, which appears to be much more affected, in negative terms, by elections.[31]

As the Centre-North variable appears to be significant in the estimates in Tables 1 and 3, we have divided our sample geographically into two parts (Centre-North and South) to observe whether the political variables may play a different role

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[31] This result is consistent with the fact that while cultural events such as festivals or parades can be postponed or cancelled in proximity of elections, libraries, museums and galleries imply expenditures that are more difficult to cut in electoral years. Furthermore, notice that GMM estimates show an unusually strong and significantly positive impact of *Leftright* in column 5; however, this result does not seem to be robust to the elimination of the non-significant variables from the model.

Table 3 Determinants of subcategories of Italian municipal cultural expenditures, 1998–2005

Dependent variable	Gross current expenditures for libraries, museums and galleries (levels)			Gross current expenditures for theatres, cultural activities and services (levels)		
	FE	GMM	RE	FE	GMM	RE
Dep. Var. (−1)		0.43196*** (0.0000)			0.31396** (0.0184)	
Gdp	0.00007 (0.6760)	−0.00019 (0.5506)	0.00013 (0.3489)	−0.00026 (0.4012)	−0.00053 (0.3315)	−0.00013 (0.5699)
Unempl.	0.03048 (0.7897)	0.39038 (0.4108)	0.11374 (0.2707)	−0.38208* (0.0780)	0.59740 (0.5544)	−0.20053 (0.2750)
BFexp	0.08004*** (0.0002)	0.24528** (0.0152)	0.08228*** (0.0000)	0.02866 (0.4735)	0.35607*** (0.0002)	0.06433* (0.0678)
Monument			2.89996*** (0.0099)			5.41854*** (0.0002)
Log Pop.	5.17958 (0.6866)	−48.12490 (0.3498)	−0.13382 (0.9320)	26.99798 (0.2671)	−17.83406 (0.8025)	−2.89669 (0.1533)
Oldpopul	0.65554 (0.1434)	0.88584 (0.4027)	0.91440** (0.0104)	−0.69304 (0.4139)	−1.37547 (0.5941)	−0.34336 (0.5502)
Youngpopul	1.39305*** (0.0156)	0.54472 (0.7240)	0.74699 (0.1350)	−0.78139 (0.4730)	−5.80324* (0.0817)	−2.16267** (0.0114)
Failmandsch			−0.02505 (0.9612)			0.88883 (0.1844)
Cultsociety	0.06368 (0.3572)	0.14819 (0.3446)	0.01569 (0.7575)	0.00929 (0.9434)	−0.47889 (0.1418)	−0.00562 (0.9425)
Electyear	−0.93344* (0.0504)	−0.76736 (0.3804)	−0.95206** (0.0452)	−2.04026*** (0.0241)	−2.99018*** (0.0087)	−2.10315** (0.0194)
Termlimit	−0.39422 (0.4122)	−3.27940 (0.2128)	−0.35499 (0.4514)	−1.76894* (0.0523)	−4.47997 (0.1593)	−1.33010 (0.1321)
Leftright	−0.80327 (0.2351)	0.25428 (0.9166)	−0.67809 (0.3006)	0.94618 (0.4603)	9.29423** (0.0440)	1.45240 (0.2263)
Centre-North			11.70561*** (0.0006)			6.95536 (0.1258)
No. of obs	800	581	800	800	581	800
Cities	106	106	106	106	106	106
Rsquare	0.8951		0.4052	0.7492		0.2749
Sargan test		0.4194			0.3831	

here and there. A concise summary of our results is in Table 4, wherein we omit the controls.[32]

Indeed, there are some differences: the electoral cycle in cultural spending seems to be particularly significant in the South.[33]

We now consider the extension of the empirical model, accounting for spatial interaction among neighbouring municipalities' cultural expenditures. Column 1 of Table 5, panel B, reports, as a benchmark, the estimates of the RE panel model already presented in the third column of Table 1.[34]

A preliminary check consists of testing for the presence of spatial interdependence in the errors of the RE panel estimates. One way to conduct such a test is to examine the result of Moran's type I test for spatial patterns.[35] The Moran's test statistic is marginally significant ($p = 0.089$), which suggests that the null hypothesis of no spatial effects can be rejected, although with low statistical power. This result motivates explicit investigation of spatial interdependence in our data.

The next step is thus to choose an appropriate spatial interaction model. In principle, several alternative models can be estimated to capture spatial interdependence.[36] To identify which spatial interaction model is the most appropriate for the spatial pattern exhibited by our data, one should examine the Lagrange multiplier (LM) test statistics developed by the literature (Burridge 1980; Anselin 1988b; Anselin et al. 1996).[37] While the LM-LAG test rejects the null at a marginally significant level (p = 0.0919), the LM-ERR fails to do so, indicating that the mixed regressive-SAR model is the most appropriate model for our data.

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[32] FE and GMM estimates on the subsamples confirm the results that we show here and are available upon request.

[33] The marginal significance of the *Termlimit* variable in the Centre-North subsample is due to the relative concentration here of *true lame ducks*. Following the suggestion of a referee, we have, in fact, tracked all term-limited mayors in their later political careers, using information from the Home Office (http://elezionistorico.interno.it/). We have then been able to distinguish between term-limited mayors who then competed for other political position and those who actually ended their careers. These two types of politicians appear to behave quite differently: the former are not different from non-term-limited mayors, whereas the latter are more prone to cut expenditures.

[34] As discussed in note 23, in fact, the Hausman test points in favour of the *RE* model in the level specification. Moreover, the presence of the time-invariant variable *Monument* among the instruments for neighbouring cities' cultural spending requires examination of the RE panel model for immediate comparability.

[35] The Moran's I statistic in our case is $I = (N/S_0)$ ($e'We/e'e$), where e is the vector of the panel RE residuals, W is our spatial weight matrix, as in Model (3a), and $S_0 = \Sigma_i\Sigma_j\ w_{ij}$ is a normalising factor that corresponds to the sum of the weights for the non-zero cross-products. The Moran statistic is based on a normal approximation, using a standardised z value (reported in Table 5).

[36] The spatial lag model (i.e. mixed regressive-SAR model) $y = \rho\ W\ y + X\beta + \varepsilon$ is one of the most common specifications used in the literature. However, an alternative model is the so-called spatial error model (i.e. SAR error model) $y = X\beta + (I - \lambda\ W)^{-1}\ u$ (Anselin 1988a).

[37] These LM tests have two advantages. First, in contrast to the tests based on the likelihood ratio or Wald approaches, they do not need the estimation of the more complex model with spatial interaction. Thus, the *RE* panel model is the only estimation required to run such tests in our case. Second, running both the so-called LM-LAG and the LM-ERR tests allows us to directly discriminate between the spatial lag and the spatial error models (Anselin 1988b). Both LM test statistics reject the null hypothesis that no spatial dependence exists and have a $\chi^2(1)$ distribution.

Table 4 Determinants of Italian municipal cultural spending (1998–2005): geographical differences

	Gross current cultural expenditures, levels		Gross current cultural expenditure over total current expenditures	
	North-Centre	South	North-Centre	South
Electyear	−3.00146* (0.0691)	−2.98161*** (0.0021)	−0.00251* (0.0529)	−0.00297*** (0.0060)
Termlimit	−3.04401* (0.0605)	1.07969 (0.2679)	−0.00169 (0.1868)	0.00151 (0.1631)
Leftright	1.16154 (0.6062)	−0.76290 (0.5462)	−0.00059 (0.7443)	−0.00126 (0.3641)
No. of obs	546	254	541	254
Cities	70	36	70	36
R^2	0.3143	0.1920	0.1771	0.1974

All models are estimated with the random-effects LS estimator

Table 5 Determinants of Italian municipal cultural spending, 1998–2005 including spatial interaction terms: results from IV (2SLS) estimates

	Dependent variable: municipality's per capita current level of gross cultural expenditures
Panel A: First-stage regression	
BFexp	0.1773*** (0.0435)
Monument	10.0317*** (1.6395)
Rsquare	0.328
F test	58.44

	Gross current cultural expenditures, levels (no spatial interaction) RE	Gross current cultural expenditures, levels, with spatial interaction terms		
		3a model	3b model	3c model
Panel B: Second-stage regression				
Neighbexp		0.03217** (0.0116)	0.02853* (0.0128)	0.04817** (0.0243)
Gdp	0.00007 (0.8258)	0.00165 (0.9336)	0.00194 (0.2672)	0.00083 (0.4537)
Unempl.	−0.05108 (0.8316)	−0.05912 (0.2578)	−0.04289 (0.3631)	−0.04642 (0.1467)
BFexp	0.14676*** (0.0015)	0.09813** (0.0292)	0.09654* (0.0386)	0.08753** (0.0321)
Monument	8.19159*** (0.0000)	6.83713*** (0.0127)	5.93516*** (0.9128)	6.14158*** (0.5896)
Log Pop.	−2.94449 (0.2679)	−2.43285 (1.4407)	−2.71615 (1.6983)	−3.85094 (1.5793)
Oldpopul	0.63828 (0.3963)	0.65147 (0.7133)	1.62338 (1.1593)	1.1675 (1.2484)
Youngpopul	−1.88086* (0.0922)	−2.3472 (1.4495)	−2.46772 (1.3854)	−1.6681 (1.3947)
Failmandsch	0.97078 (0.2684)	0.94964 (1.3118)	1.32841 (0.9967)	0.89357 (0.8872)
Cultsociety	−0.02328 (0.8195)	−0.04149 (0.1436)	−0.05485 (0.0893)	−0.12466 (0.1352)
Electyear	−3.05951*** (0.0094)	−2.81356* (1.2418)	−2.9674* (1.2905)	−3.4196** (1.6536)
Termlimit	−1.67472 (0.1471)	−1.95624 (1.1984)	−0.89025 (1.3276)	−2.38864 (1.7562)
Leftright	0.87194 (0.5786)	0.84337 (1.4762)	1.13829 (0.9365)	0.9237 (0.7164)
Centre-North	17.69252*** (0.0030)	14.05785*** (0.6648)	9.84663*** (0.5928)	12.69252*** (0.8974)
No. Of obs	804	804	804	804
Cities	106	106	106	106
Rsquare	0.4483	0.4169	0.3826	0.3957
Moran I test	1.347*			
LM-LAG test	2.84*			
LM-ERR test	2.16			
Hansen *J* test		0.87	1.25	1.13

Panel A presents first-stage estimates of IV regression. The dependent variable is the per capita gross cultural expenditures of a municipality. Panel B presents the results from second-stage 2SLS estimates on a panel of 106 Italian cities during years 1998–2005. The dependent variable is the municipal per capita gross cultural expenditures. The explanatory variable Neighbexp is the average cultural spending by cities whose provinces are contiguous to a municipality, according to the specific definition of neighbourhood and spatial weight matrices in Models (3a–c). The *F* test statistics in Panel A refer to the null hypothesis that the coefficients of the instruments are jointly equal to zero in the first-stage regression. The Moran's I statistic in Panel B tests for the presence of spatial dependence in the residuals of the panel RE model with no spatial interaction. The LM-LAG and LM-ERR tests in Panel B assess whether the spatial dependence in the residuals is more likely to derive from the spatial lag or the spatial error model, respectively, and are both distributed as a $\chi^2(1)$. The Hansen *J* test is a test for over-identification of restrictions and is distributed as a $\chi^2(1)$ under the null that instruments are valid

As discussed in Sect. 5, we thus estimate a spatial lag model where the per capita level of cultural expenditures by municipality i is explained not only by its own characteristics but also by the average level of cultural expenditures by the cities that share a provincial border with it. To address the problem of endogeneity of neighbours' cultural spending, we adopt an IV (2SLS) approach, where a set of variables is used as instruments of neighbouring municipalities' cultural expenditures. In particular, we consider as instruments of cultural spending by city j at year t its contemporaneous level of the variable BFExp and its time-invariant variable Monument.[38] In fact, all our previous panel regressions show that these two variables are consistently among the best predictors of municipal current per capita cultural spending (Tables 1, 3 and 4). This finding is also confirmed by the strong positive correlations and the results of the first-stage regression in 2SLS: the coefficients of BFExp and Monument are highly statistically significant and positive, as expected, and the regression has good explanatory power (panel A, Table 5). Standard IV diagnostic tests show that the selected instruments are valid.[39] Moreover, the Hansen J test for over-identifying restrictions fails to reject the null hypothesis that instruments are valid and exogenous to the second-stage regression (bottom row in panel B, Table 5).[40]

We estimate three distinct versions of the spatial lag model, which differ only in the way the spatial weight matrices and, ultimately, the neighbours' average cultural spending are computed. In Model (3a), we consider the average expenditures by all municipalities whose provinces are contiguous to city i's province; in Model (3b), average expenditure is weighted by the population living in the contiguous cities; in Model (3c), we only consider the average expenditure by the neighbouring municipalities within the same region of city i. Columns 2–4 of Table 5, panel B, report the results of the estimation of the (3a–c) variants of the mixed regressive-SAR model.[41]

In general, the estimates show a significant and positive effect of the average cultural expenditure of neighbouring municipalities. This result seems to indicate that in the case of Italy, cultural spending by contiguous cities exerts positive spillover effects.[42] Notice that the estimated effect is small in size but not negligible, accounting for approximately one-third of the effect of private cultural

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[38] While there is little doubt that the Monument variable is exogenous, the empirical literature offers many examples where neighbours' economic or socio-demographic variables are used as instruments for the expenditures by contiguous cities (Baicker 2005; Geys 2006; Werck et al. 2008).

[39] The F statistic for joint significance of these instruments in the first-stage regression is 58.44, which is well above the critical values for one endogenous regressor and two instruments (i.e. one over-identifying restriction) indicated by the empirical literature on weak instruments (Stock and Yogo 2005).

[40] The Hansen J test statistic is distributed as a $\chi^2(1)$ in our case because we have two instruments for each endogenous variable (i.e. one over-identifying restriction).

[41] Having experimented with a number of variants of this baseline model (e.g. net expenditure, log–log, subsets of regressors, all available upon request), we can safely conclude that the results presented here are quantitatively and qualitatively robust in comparison with alternative specifications of the dependent variables and covariates.

[42] Notice that the estimated positive effect seems much stronger and also gains statistical significance, if one only considers the subsample of the cities in north and central Italy, whereas it is not significant for the cities in south Italy.

spending on municipal cultural spending. Hence, neighbouring cities' cultural expenditures should be regarded as complements rather than substitutes. This result is in line with what Werck et al. (2008) found for Flemish municipalities, but it is in contrast with what Lundberg (2006) found for Sweden.[43] In particular, both the size of the estimated coefficient and the statistical significance of the spatial interaction term are higher in Model (3c) than in Models (3a–b). This finding seems to indicate that in Italy, spillover effects on cultural spending by contiguous municipalities seem particularly remarkable across cities belonging to the same region.[44] The effect is smallest in magnitude in (3b), suggesting that positive spillovers tend to be smaller in the presence of larger neighbours, possibly because of stronger incentives for 'free riding'.[45]

Given the main objective of our analysis, it is perhaps of greater interest to examine the estimated coefficients of the other explanatory variables. The introduction of the spatial interdependence terms does not radically alter the qualitative results of our previous estimates. Both *Monument* and the dummy variable for *Centre-North* now exhibit smaller estimated coefficients but remain highly significant. Private cultural expenditure shows a decline both in the level of statistical significance and in the estimated size of the coefficient; this result suggests that not accounting for spatial dependence may lead to over-estimating the effects of some variables.

Similar arguments also apply to the variable *Electyear*. Notice, however, that the negative sign of the coefficient is confirmed, and its significance is not marginal in Model 3c. This result seems to confirm the existence of a peculiar electoral cycle in the cultural expenditures of Italian cities.

7 Robustness checks

We have also estimated different model specifications to test the robustness of our previous results for changes in the number and type of explanatory and control variables.[46]

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[43] In principle, both findings can be supported by motivated arguments. On the one hand, Werck et al. (2008) suggest that the evidence of a positive spillover effect supports the idea that *"arts are an 'acquired taste'"*, for which availability in surrounding cities may trigger higher demand at home, and that *"local politicians tend to follow each other's lead"*. On the other hand, Lundberg (2006) argues that cultural spending by contiguous municipalities are *"strategic substitutes"*: increases in cultural spending by neighbouring cities lead a municipality to reduce its own cultural expenditures, as residents can "free ride" on contiguous cities.

[44] This finding may suggest that local politicians are more likely to compare their cultural spending to what their peers do in contiguous city councils and/or that citizens of one municipality are more likely to be aware of, or more keen to attend, cultural events occurring in contiguous cities within the same region.

[45] This result is in line with Werck et al. (2008).

[46] The results of these estimates are omitted and are available upon request.

First, we have tried to control for the possibly divergent dynamics of public servants' productivity with respect to private employees, along the lines of Baumol's cost-disease argument (Baumol and Bowen 1966).[47] Using OECD data, we have constructed an index for a government-consumption price deflator over GDP deflator. The inclusion of such an index in our empirical models does not appear to make any difference in our previous results: the index is, indeed, never significant, while the sign and significance of all other regressors remain unaltered. We interpret the lack of significance of the index in the light of the fact that, on average, more than half of Italian municipal spending on culture is for museums, galleries and libraries, fields in which Baumol's cost disease is probably not as serious as in the performing arts.

An alternative specification we have considered includes some variables that capture the role of a city as a touristic destination. It may be argued, in fact, that the ability of a city to attract tourists is captured only to a weak extent by the monument variable. We have thus tried several alternative specifications, introducing, among the explanatory variables, the number of hotels in a city, the number of other types of tourist accommodations (such as *bed & breakfast* and camping sites, among others) or combinations of these variables.[48] We have also tried to normalise these variables to the city's population. Available data on the number of hotels and other accommodations in each city come from the Italian national statistical office (ISTAT) and refer to 2005.[49] In general, these variables are not significant, except in some of the models in which the dependent variable is cultural spending over total spending, where, surprisingly, they have a negative sign. One possible reason for these variables not being significant to explaining cultural expenditures across Italian cities may be related to the fact that the number of hotels in a city also depends on the distance of the city from surrounding areas exerting a touristic appeal, such as mountains, lakes or the sea, or other aspects of a city's economic life, such as being a business or university town.[50] Regarding the other regressors, the inclusion of variables accounting for tourism does not generally alter the main results, the only exception being the estimated coefficient of *Log Pop*, which, as expected, often becomes significantly negative.

A third line of extensions we have considered is the inclusion of public finance variables. Recent empirical works highlight the relevance of fiscal variables in explaining cultural spending (Noonan 2007). In particular, we estimate an alternative specification of our model, including among the regressors aggregate transfers from central government. We have found that this variable is not

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[47] We are grateful to one referee for this suggestion.

[48] We have also considered alternative variables to capture the ability of a city to attract tourists. However, we finally decided not to include other available variables, such as the number of tourist arrivals in a city, to avoid potential endogeneity problems.

[49] As one can realistically expect small variations in the number of hotels and accommodations from 1 year to another, we have used the 2005 data for each year in our panel.

[50] This seems to be confirmed by the fact that the correlation of these variables with *Monument* is typically low.

significant either, possibly because we use an aggregate measure that is the same for all cities at year t.

We have also tried several other specifications in which we have included on the right-hand side other economic variables, such as provincial added value, or geographic dummies for the autonomous regions. However, none of these variables have turned out to be significant, while very little changed concerning the estimated sign, size and significance of the coefficients of the above-discussed variables. Finally, we have experimented to a great extent with a variable constructed to represent the proportion of the population holding high-school diplomas. Though sometimes significant, its coefficient's magnitude and sign are not very robust. The overall estimates of these extensions suggest that the above-presented results seem robust in comparison with alternative specifications of the model.

8 Conclusions

Public spending on culture, generally a small portion of total public spending, is soon to become a rapidly growing figure in national accounts. The economic literature finds interesting interpretations of this trend and identifies culture as key to a nation's growth and competitiveness.

Yet fiscal policy has long since been proved to be subject to the distorting incentives of political actors, and public spending on culture may be no exception.

We have used data on 106 Italian cities over the 1998-2005 period and have verified that though political orientation does not seem to play a role, indeed, some determinants of public expenditures on culture are political. In particular, we have identified an electoral cycle in which the incumbent spends less on culture around an election year. This finding challenges the common view of more museum openings around election dates and makes sense only if voters prefer other types of public spending to cultural spending.

These findings stress that in line with other theoretical and empirical works on the subject (Alesina and Tabellini 1990; Perotti 1996), it is important to consider the effects of political variables not only on the size of government but also on its nature, namely the composition of public expenditures.

As for policymaking implications, the experience of Italian municipal governments shows that pleasing voters who ignore the positive contribution of cultural public spending to growth is a common practice, though, perhaps, a short-sighted behaviour. Given these types of voter preferences, the alternative option, a consistent public commitment to cultural spending, is possible only if it accompanies an appropriate communication and education strategy.

Appendix

Data	Source of data
Political Data	F. Padovano for IREF (*Institut de Recherche Economique et Fiscal*)
Municipal government budgetary data	Home office (*Ministero degli Interni*) http://finanzalocale.interno.it/sitophp/home_finloc.php?Titolo=Certificati+Consuntivi
Socio-economic variables and price deflator	ISTAT
Number of cultural clubs	F. Buonanno (elaborating on ISTAT)
Monument	Carta del Rischio, ICR (*Istituto Centrale del Restauro—Ministry of Culture*)
Private spending on culture	ACRI (*Associazione di Fondazioni e di Casse di Risparmio*)

We have constructed our political series after integrating the IREF database with the data referring to Aosta, Bolzano, Trento, Pordenone, Udine, Gorizia, Trieste and some Sicilian cities, which were partially missing. Concerning the electoral dummy *Electyear*, we have classified as *1* all electoral years, which are different in every city. The classification of a party as left- or right-wing has been made according to IREF; we only added *Union Valdotaine* to the group of left-wing parties, as it was not mentioned in Padovano's file. The left–right dimension has been recorded in *Leftright* along the 0 (right)–1 (left) scale; mayors belonging to 'civic lists' and 'not classified' parties (a very small minority) have been coded as missing. In electoral years, regardless of the election date (usually in late spring, sometimes in autumn), the left–right dummy reflects the political stance of the incumbent. Centre-party mayors are very few. Finally, we have constructed the *Termlimit* dummy based on IREF's information about mayors' names and the consideration that Law 81/1993 prescribes that:

- a two-term term limit has been in effect since 1993 and
- a third candidature is possible if either mandate has ended before the mid-term date for any reason but voluntary resignation.

Data about banking foundations' cultural spending have been provided by ACRI. It is not infrequent for banking foundations to spend in more than one city. We have therefore elaborated ACRI's data on banking foundations' spending on culture in a number of cases:

1. Some banking foundations are not from a provincial administrative centre but instead from a smaller town. We have considered in this case the province in which the town is located and have imputed 25% of their total spending to its administrative centre.

Table 6 Summary statistics

	Variables used in regression analysis	Mean	SD	Min	Max
Cultural spending	Per capita municipal current spending on culture at constant 2007 prices	44.62341	29.61828	0	257.5495
Expenditures on libraries, museums etc.	Per capita municipal current expenditure in libraries, museums and galleries at constant 2007 prices	17.69949	15.25392	0	102.3353
GDP	Per capita provincial GDP at constant 2007 prices	21,390.46	5,356.873	10,323.66	38,248.12
Unempl.	Provincial unemployment, in percentage points	9.36044	7.02142	0.08333	35.00000
BFexp.	Municipal banking foundations per capita cultural spending at constant 2007 prices	10.01716	20.87994	0	219.1284
Monument	Municipal number of cultural goods, normalised on a 0–7 scale	4.16037	1.25318	1	7
Log Pop	Log of city population	11.46124	0.861671	9.622781	14.76625
Oldpopul	Proportion of total city population over 65, in percentage points	20.57566	3.519295	11.26915	28.65310
Youngpopul	Proportion of total city population under 15, in percentage points	12.84805	2.152504	8.586949	20.08328
Failmandsch	Proportion of total city population failing completion of mandatory school, in percentage points	10.08774	3.029671	4.46000	18.08000
Cultsociety	No. of cultural clubs per 100.000 inhabitants (province)	40.15435	17.41459	12.72	102.49

2. The names of some banking foundations refer to both a smaller town and its administrative centre or to the administrative centre and its province. We have imputed 50% of their total expenses to the administrative centre.
3. The names of some of them include a number of administrative centres. In this case, we have divided the spending figure according to weights reflecting their population.
4. Finally, the name of four banking foundations refers to a region (including many provinces), and one foundation refers to two regions. In this case, just as in 2, we have assumed only half of their total spending goes towards provincial administrative centres, the rest being directed to smaller towns, and we have used the same criteria as in 3 to calculate the share of expenditures in favour of each provincial administrative centre.[51]

The use of weights based on the relative size of towns may sound arbitrary, but we believe it may closely reflect the marketing strategies and effect of political influence on banking foundations' decisions.

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[51] Fondazione Banca Nazionale delle Comunicazioni was neglected, as it did not have a territorial reference. Its expenditures on culture are, however, negligible.

ACRI only provides the distinction between capital and current cultural spending at an aggregate level. In the years we consider, the weight of capital on total cultural spending is stable, at approximately 40%. Therefore, to have current private cultural spending in each city, we consider only 60% of the amount calculated, as illustrated above. The variable thus obtained is expressed in constant 2007 prices.

In Table 6, we summarise the statistical properties of all the data we use (except the political and geographical dummies).

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