# HETEROGENEITY IN CULTURAL EXPENDITURES OF THE MUNICIPALITIES: EVIDENCE FROM ITALIAN DATA (1998-2006)

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# Heterogeneity in Cultural Expenditures of the municipalities: Evidence from Italian Data (1998-2006)

**Abstract**

On the basis of a unique dataset referred to all the 8,100 Italian municipalities - regarding their balance sheets, institutional-political features of the local governments and socio-demographic characteristics and economic indicators -, we analyze the determinants of the local cultural expenditures of the Italian municipalities. This aspect is crucial for residents, also having a direct impact on their daily life.

We exploit the panel nature of the data to explain the heterogeneity due to observable characteristics as well as the unobservable heterogeneity. Other than the traditional determinants, we find that per capita cultural expenditures increase with the population size, but decreases with the share of men on total population; the share of immigrants increases the local cultural spending only in the long run. Per capita cultural expenditures are also affected by the number of years in power of the council.

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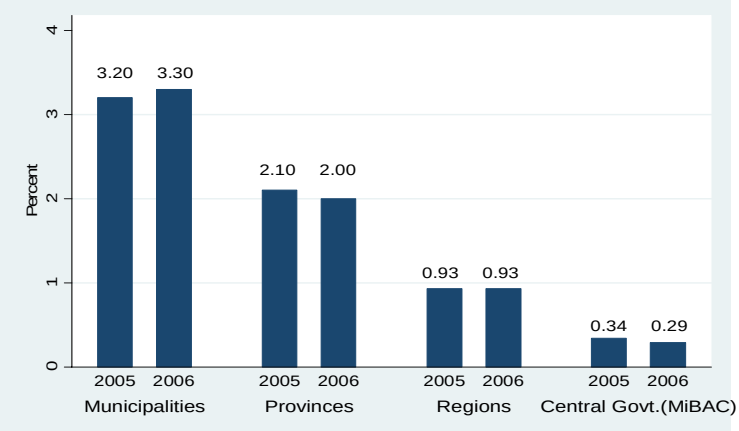
## 1. Introduction

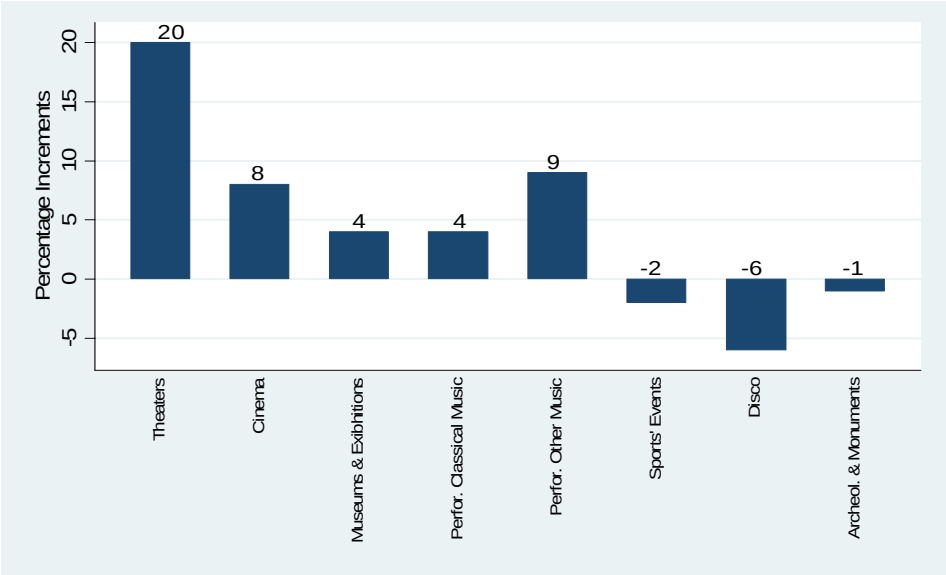
The cultural sector has become the object of new attention in the public economics literature. It is widely recognised as essential for the human capital formation of a country and it gives a positive contribution to economic growth both by playing an important role in social inclusion and integration policies, in the light of increasing immigration phenomena, and by generating positive externalities for a number of economic activities like tourism. In Italy two main actors (central government and municipalities) cover about the 90% of total public spending for culture (Bodo, 2006 and Bodo and Bodo, 2007) that in the years 2005 and 2006 had the following impact on balance sheets of the different actors (Figure 1, Berna Berionni, 2009):

**Figure 1. Share of cultural public spending (percentage on their own total balance): Years 2005 and 2006**




The central government plays traditionally a major role – although not for the overall amount of spending - in that, under the existing legislation, it always supervises/protects the Italian artistic heritage. Nevertheless, in recent years municipal governments have recovered their positions, not only in the traditional management of civic libraries, museums and theatres, but also for the organisation of cultural events in the field of performing arts heritage and contemporary, which are becoming increasingly important as for households' preferences (Figure 2). Therefore, understanding the driving forces of local cultural public spending is important also because of its consequences on residents' daily life.

**Figure 2. Percentage variation of cultural and hobbies consumption by type of entertainment (1999-2007)**




Source: ISTAT – Survey on Housholds - Multiscopo

Here, we concentrate on the determinants of the per-capita cultural expenditure of all the 8,100 Italian municipalities. We take advantage of a very rich and detailed dataset at a municipal level composed by the balance sheets of all the Italian municipalities, as provided by the Italian Ministry of Internal Affairs,[1] which has been merged with the local demographic and economic information provided by the municipalities themselves as well as by the Italian National Statistical Office (ISTAT). The universe of the municipalities is, *per se*, remarkably heterogeneous, being composed of municipalities of different population size, located in different geographical areas and with quite different historical and cultural traditions. For these reasons, the municipal spending for culture cannot be properly explained only by the traditional determinants of cultural spending, say, as a budget allocation among the different cultural goods and services supplied by the municipalities, given population and local income. Here, we explain the heterogeneity of the local expenditures for culture as a function of observable characteristics, while recognizing that also unobservable heterogeneity might play a role and must be recovered otherwise.

Among observable characteristics, when considering local cultural spending two basic elements must be considered: the local public choice as the result of a bargaining inside the council and the composition of the population as for gender and citizenship.

[1] In the balance sheet the total expenditures are disentangled in twelve different functional areas, e.g., general administration, justice, local police, public education, cultural services, sport and leisure, tourism, viability and transports, environment, social sector, economic development, productivity services.

Consider first the local governments' budget allocation. In a recent paper Dalle Nogare and Galizzi (2009) investigate the relationship between Italian municipalities' spending on culture and the political/partisan features of local governments focusing on 106 Italian municipalities (i.e., those which are provincial administrative capital) and find that some political variables significantly affect local cultural expenditure. Here, the analysis of cultural spending of the universe of 8,100 Italian municipalities does not allow us to disentangle a basic political feature of the local governments, namely whether they are left or right-wing oriented. The reason is that most municipalities, basically the smallest - that are, however, more than the 70% of the total – are run by the so called "civic coalition" with undistinguishable/unidentifiable political "colour". Nevertheless, the data from the Italian Ministry of Internal Affairs contain some other detailed information on the composition of each local council as for age, gender and education of the mayor and of the councillors of the cabinet and of the elected representatives. This is an important piece of information for explaining heterogeneity because very similar municipalities make quite different cultural choices with remarkable different consequences (see below).

As for the composition of the population, at least three relevant aspects are important for the final outcome of per capita cultural expenditures: they are gender, age and citizenship of the inhabitants. Indeed, the demographic structure of the population might be relevant for the peculiar type of public expenditures considered. For different reasons, it might well be that, say, the more the women/men in a given area, the higher/lower the cultural expenditures. As well as the older/younger the population the higher/lower the cultural expenditures. The distinction by nationality is a quite intriguing issue. It is usually argued that immigrants tend to free-ride on native for the public supplied goods and services, thus increasing the cost for the entire community (Borjas, 1995). As for cultural spending, however, the opposite thesis might also occur: the difficulties of integration and cultural differences might make the immigrants not to consider the public supply of cultural services by referring instead to their own private networks for their (national, religious or ethnic) provision of cultural goods, whatever it means. We are able to evaluate the impact of immigration on cultural expenditure although only on a shorter sample period: in particular, by recovering the share of immigrants in each single municipality, available since 2002 only, we can test whether immigrants actually increase the per capita cultural supply for the local community, e.g., the higher the number of immigrants, the higher the expenditures. If immigrants play no role in cultural spending or if immigrants refer to their own private networks, then the higher the number of immigrants in the community the lower the per capita expenditures of the population.

Dealing with longitudinal data, we can take into account the unobservable heterogeneity that determines different attitude towards culture, widely defined, by apparently similar municipalities. As

mentioned, Italian municipalities differ from each other for unobservable components, such as, amongst other, the cultural heritage, which is not easily measurable. In this respect, a major complication arises here because dealing with censored observations the estimation techniques of these unobservable components are non trivial. We shall use a Tobit model to consistently estimate coefficients in presence of censoring. The longitudinal dimension allows us to consider the unobservable heterogeneity with the approach introduced by Mundlak (1978), which allows us to distinguish between the effect due to temporary or permanent changes in the covariates.

The paper is organized as follows. In section 2 we considers some stylized facts showing the peculiar aspects of local public spending. Section 3 reviews the econometric techniques with which we approach the issue. Section 4 reports the empirical results. Conclusions follow in section 5.

## 2. Some stylized facts

In this section we overview some relevant factor affecting the cultural supply of the Italian municipalities. The main interest is in the per capita public expenditure for cultural services (monetary amount deflated by the CPI (2000) as released by ISTAT). [2]

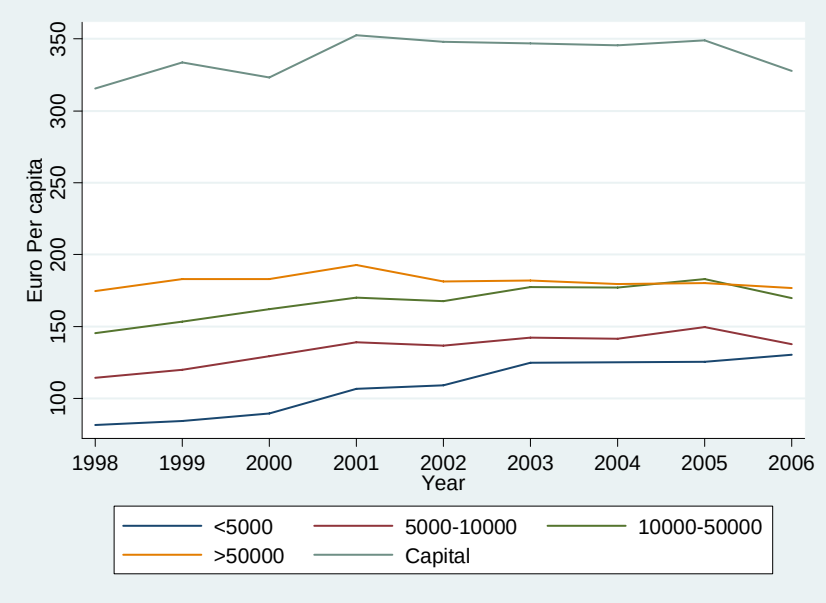
Italy is an heterogeneous country of 8,100 municipalities over a total of 106 provinces. The vast majority of these are small in terms of inhabitants: about 71% of total municipalities have less than 5,000 inhabitants and are also characterized by a different local electoral system. About 15% of the municipalities have a population between 5,000 and 10,000 inhabitants, and 12% between 10,000 and 50,000 inhabitants, whereas the remaining 2% is over 50,000. Among the latter, the municipalities which are also provincial administrative capitals, being characterized by different financial features and by higher mediatic exposure, shall be considered separately.

Figure 3 shows the average per capita public expenditure for cultural services by municipalities of different dimensions. A number of important characteristics emerge. First, the per capita cultural expenditure increases with the number of inhabitants. Over the period 1998-2006, the average per capita expenditure for culture is about 108 euros for the smallest municipalities, 135 euros for municipalities between 5,000 and 10,000, 170-180 euros for municipalities between 10,000 and 50,000 or more and about 340 euros for municipalities which are administrative provincial capital. Hence, the latter show a

[2] The cultural supply in Italy provided by the public sector is largely documented, whereas the amount of available information regarding private supply is rather limited. The official statistics on private supply released by ISTAT (data are available at http://www.istat.it/dati/catalogo/20081013_01/) are not very helpful for this study, because unavailable for each single municipality which is the reason why we do not refer to it here. Moreover, we discard from the analysis the municipal provision of services for tourism, given that, although often strictly related to cultural supply, they are mainly devoted to the financing of touristic attractors for non-lasting people and also widely diversified in each local area. This makes it impossible their unitary consideration for the universe of the Italian municipalities.

per capita cultural expenditure about twice than the others. However, the variance is about 100-140 euros for all municipalities, but it is 220 euros for the provincial administrative capital of province and 240 euros for the smallest municipalities. This means that heterogeneity is important no matter the population size, and that for smaller municipalities it is even more important than for the others. Moreover, the cultural supply differs among municipalities not only because of their size, but also for municipalities' location. As for the geographical heterogeneity, in Northern Italy (Liguria, Lombardy, Piedmont, Valle d' Aosta, Emilia Romagna, Friuli Venezia Giulia, Trentino Alto Adige, Venetum) the per capita expenditure for cultural services is slightly higher than in Central regions (Latium, Marche, Tuscany and Umbria), of about 30-50 euros, 170 *vs* 200 euro, whereas in Southern Italy (Abruzzo, Basilicata, Calabria, Campania, Molise, Puglia) per capita cultural expenditure is always smaller than 100 euros. In Sardinia and Sicily the per capita expenditure for culture is similar to Northern regions.

**Figure 3: Per capita public expenditure for cultural services**




The per capita public expenditure for cultural services is clearly affected by the type of services supplied. We can control for those traditionally supplied by almost all the municipalities, which are: libraries, theaters, museums, various type of performances (broadly defined – including the summer cultural events, vernissages, exhibitions, film/theatrical shows, seasons of films, "white-nights" and the like….). Their sample average over time, distinguishing by population size and by year, is reported in Table 1.

**Table 1: Local Provision of cultural goods and services. Averages by population size.**
**Theaters' seats**

| Thousand of inh. | Year 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|
| <5 | 387.0 | 414.6 | 350.9 | 276.2 | 289.0 | 310.6 | 196.0 | 199.3 | 192.5 |
| 5-10 | 586.7 | 427.5 | 289.0 | 328.9 | 265.5 | 327.5 | 246.2 | 238.9 | 236.6 |
| 10-50 | 853.7 | 1146.7 | 1562.8 | 2138.1 | 2300.2 | 593.1 | 322.6 | 327.0 | 327.4 |
| >50 | 9136.8 | 7371.1 | 3401.6 | 3949.9 | 6260.5 | 563.9 | 434.0 | 374.5 | 332.7 |
| Capital | 8806.6 | 5153.2 | 3904.0 | 6214.0 | 6810.6 | 986.9 | 424.8 | 456.3 | 446.2 |

**Number of museums**

| Thousand of inh. | Year 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|
| <5 | 15.2 | 13.2 | 18.9 | 28.4 | 6.8 | 1.5 | 1.3 | 1.2 | 1.3 |
| 5-10 | 4.5 | 4.5 | 4.8 | 6.3 | 5.4 | 2.0 | 1.4 | 1.3 | 1.4 |
| 10-50 | 9.2 | 4.6 | 3.9 | 5.5 | 5.8 | 2.1 | 1.6 | 1.6 | 1.8 |
| >50 | 7.4 | 26.8 | 31.0 | 39.9 | 7.6 | 2.2 | 1.9 | 1.9 | 2.0 |
| Capital | 15.6 | 9.0 | 11.6 | 12.3 | 6.5 | 3.6 | 1.9 | 2.1 | 2.2 |

**Number of performances of various type**

| Thousand of inh. | Year 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|
| <5 | 50.7 | 17.1 | 10.7 | 9.3 | 8.6 | 9.4 | 5.2 | 6.4 | 7.9 |
| 5-10 | 50.5 | 13.1 | 17.6 | 22.8 | 21.1 | 19.5 | 7.1 | 5.1 | 8.0 |
| 10-50 | 38.1 | 42.2 | 41.6 | 41.3 | 40.6 | 32.5 | 9.3 | 7.5 | 10.5 |
| >50 | 57.5 | 56.5 | 67.6 | 113.0 | 85.4 | 44.5 | 1.0 | 6.5 | 10.5 |
| Capital | 254.1 | 56.8 | 214.8 | 88.9 | 110.1 | 55.6 | 23.7 | 17.0 | 7.0 |

Two aspects should be emphasized from previous table: first, at the beginning of the period there is a much higher heterogeneity across municipalities of different population size than in the following years, but over time there is a convergence, for all population sizes, towards closer levels of provision for number of performances (about 10 performances per municipality in year 2006, from 38 performances in medium size municipalities or 250 in the administrative capitals of provinces in 1998) and number of civic museums (2 museums per municipality in year 2006) or at least towards a smaller dispersion as for the number of seats of theaters (depending on the specific size of the municipalities, from 400-9000 seats per municipality at the beginning of the period to about 200-400 seats per municipality in 2006). This "convergence" is caused both by the electoral cycle (see below) and by a remarkable reduction of the central grants started in 2003, due to a tougher application of the internal stability pact joint with limit to the local public expenditures:[3] for example, the average number of seats in theaters for cities with more than 10,000 inh. is above 5,000 until 2002, and reduced in 2003, to stabilize at the final values since

[3] Actually, the Internal Stability Pact came into force in 1999 for the monitoring of local accounts by central government. Nevertheless, after few years, in 2002 the public finance crisis imposed a more rigid application of it, including also penalties for those municipalities having a budget deficit.

2004, much below 500 seats per municipality. This aspect would be coherent with the hypothesis that cultural activities are the firsts to be cut in periods of difficulties of public finances.

Second, apart from convergence, no matter the service under study, the per capita provision is larger in bigger municipalities than in smaller municipalities. However, the higher average level is paired to a higher variance. In particular, in the administrative capital of provinces, where the average cultural expenditure is the highest, the variance is the highest. On the contrary the smallest municipalities with the lowest expenditure show a quite low variance.

As mentioned, the final outcome of cultural expenditure is, among others, the result of a decision of the local government political bargaining. Therefore, it is interesting to have a look at the composition of the council. We begin with gender, age and education of the mayors. Only a small fraction of municipalities are led by women (less than 10%, see Table 2 col. 1), with some differences across geographical areas: for example, 10% municipalities in Northern Italy are led by women, both West and East, 5% in Islands and 4.2% in Southern Italy. The average age of the mayor is about 50, with virtually no differences due to geographical area, population size or gender. Finally, the education of the mayor is, on average, quite high: in more than 80% of municipalities the mayor is graduate, with no relevant differences depending on geographical area. As for the composition of the local government the figures are less dramatic, as emerges from Table 2 (columns 2 and 3): women are more represented in the council (14% of total number of councillors are women) and even more when we consider the municipal elected representatives (15 to 20% are women). In Southern Italy, however, coherently with a lower share of women-mayor, we also found a smaller share of women in the council and in the assembly.

Finally, the electoral cycle can be relevant. Two aspects are worth noting: the length in power and the electoral years. In this respect, notice that the legal length of time for a municipal government in Italy is five years, with only one possible immediate re-election of the mayor (*art. 51, Decreto legislativo 18 agosto 2000, n. 267*). The distribution of the local administrative elections remarkably varies by year and by population size (Table 3). Small to medium size municipalities (up to 50,000 inh.) have two distinct peaks in years 1999 and 2004 (when about 60% of municipalities were under administrative elections), whilst in other years only in 10% of municipalities underwent elections. In the biggest municipalities and in administrative capital of provinces there is no distinct peak, because their local elections are related to both local elections and to national general elections (general election for the Italian parliament took place in 2001 and 2006), thus we observe a slightly higher percentage of municipalities where there were elections in 1999, 2001, 2004 and 2006.

**Table 2: Share of women in local political institutions (average values 1998—2006).**

| Thousand of inh. | Mayor | Cabinet | Council |
|---|---|---|---|
| <5 | 0.077 | 0.141 | 0.230 |
| 5-10 | 0.092 | 0.139 | 0.201 |
| 10-50 | 0.072 | 0.133 | 0.168 |
| >50 | 0.071 | 0.115 | 0.115 |
| Capital | 0.070 | 0.143 | 0.149 |

**Table 3: Percentage of municipalities having local-administrative election (distribution by years and population size)**

| | Thousand of inh. | | | | |
|---|---|---|---|---|---|
| Year | <5 | 5-10 | 10-50 | >50 | Capital |
| 1998 | 7.7 | 14.7 | 22.1 | 29.1 | 31.7 |
| 1999 | 65.2 | 53.4 | 44.2 | 29.1 | 34.0 |
| 2000 | 12.4 | 10.7 | 15.0 | 22.8 | 14.7 |
| 2001 | 16.2 | 19.4 | 26.6 | 27.7 | 23.8 |
| 2002 | 9.8 | 19.3 | 25.4 | 41.8 | 26.7 |
| 2003 | 6.1 | 10.4 | 14.9 | 14.8 | 12.0 |
| 2004 | 61.5 | 52.6 | 43.3 | 31.6 | 29.4 |
| 2005 | 13.7 | 10.1 | 14.1 | 31.5 | 17.5 |
| 2006 | 16.0 | 17.8 | 24.6 | 26.3 | 25.3 |

What are the characteristics of the population demanding for cultural services? Different preferences can clearly be associated to differences due to gender, age or nationality. Unfortunately, detailed data on age of the population for each single municipality are not available. Thus, only two aspects shall be considered here: the share of men over total population and the share of immigrants. The former is almost constant, slightly less than 50%, no matter the migration status. As for the share of immigrants, it is about 3.5-5% in 2006, after an increasing pattern beginning at 1.7-2.9% in 2002, the first available data (Table 4), encountered in all the municipalities, no matters how large they are. In general, the figures are quite similar across municipalities of different population sizes, apart possibly from 2006. Although the numbers are quite close across municipalities of different population sizes, the lowest figure is observed in the biggest municipalities that are not administrative provincial capital, followed by the smallest municipalities. The similarity of the figures across municipalities of different population sizes is particularly relevant when we want to test whether immigrants increase the per capita cultural expenditure because the assimilation process could be “non-continuous”, i.e. there could exist some threshold below which immigrants are welcome and above which are not welcome. If such threshold exists, the figures for all the municipalities are close enough to assure both that, on average the municipalities are at the same point with respect to the threshold and that the results of our empirical application are not driven by the relative position with respect to the threshold.

**Table 4: Percentage of immigrants over total population in the Italian municipalities (2002-2006)**

| | Thousand of inh. | | | | |
|---|---|---|---|---|---|
| Year | <5 | 5-10 | 10-50 | >50 | Capital |
| 2002 | 2.35 | 2.61 | 2.35 | 1.73 | 2.93 |
| 2003 | 3.00 | 3.38 | 3.08 | 2.27 | 3.78 |
| 2004 | 3.43 | 3.99 | 3.72 | 2.90 | 4.49 |
| 2005 | 3.71 | 4.43 | 4.13 | 3.14 | 5.03 |
| 2006 | 4.00 | 4.91 | 4.58 | 3.52 | 5.55 |

## 3. Econometric issues

In this section we deal with some econometric issues that are important for our analysis. The above figures show a great variance and heterogeneity of the data, not only due to the different size of the municipalities, but also to their geographic, demographic and economic characteristics. Therefore, it is important to preserve all the features of the data, in particular that, first, some municipalities have zero expenditures and that, second, all the municipalities are observed every year and the longitudinal dimension is crucial to study the unobserved heterogeneity.

The main difficulty with the data at hand is related to the values of per capita expenditures, which are left censored at zero, since by definition they can only be non negative. If untreated, the information contained in the zeros is a potential source of inconsistency: on the one hand, they might not be a realization of the true underlying relationship, on the other hand, they cannot be simply thrown away. In order to cure for possible sources of inconsistencies we use a Tobit model, whereas to take care of unobservable heterogeneity we exploit the panel dimensionality. In what follows, we briefly discuss the features of the Tobit model and then address some issues related to the Tobit with panel data.

The theory that shall be outlined in this section is valid only for exogenous covariates. In the case of civic libraries, the municipal balance sheet does not provide information that can be thought of as exogenous to cultural expenditures. Indeed, we only have the cost of libraries, which is determined simultaneously with cultural expenses. This is a possible source of inconsistency known as simultaneity bias, that must be purged through Instrumental Variable (IV) for the theory below to be valid. In a non-linear framework, like Tobit models, the problem is solved following the classical IV approach, that will not be exposed here (Amemya, 1974 and Foster, 1997).

### 3.1. Pooled Tobit estimation

We formalize the problem as follows. We are interested in the relation between per capita cultural expenditures, y, and a set of covariates, x. As usual the vector of disturbances is denoted by, ε:

$$\begin{cases} y^* = x'\beta + \varepsilon \\ y = 0 \quad if\ y^* \le 0 \\ y = y^* \quad if\ y^* > 0 \end{cases} \tag{1}$$

This representation formalizes that y can take only non negative values. In these cases OLS estimates present some potential problems. In general the conditional mean function from a OLS regression will be biased, with the bias depending on the share of censored observations with respect to the total sample. In the case of censoring at zero and under the assumption of normally distributed errors, the conditional expectation of y is

$$E(y \mid x) = \Phi\left(\frac{x'\beta}{\sigma}\right)\left(x'\beta + \sigma\lambda\right),$$

where $\Phi$ is the cumulative distribution function from a normal density, and $\lambda = \frac{\phi(x'\beta/\sigma)}{\Phi(x'\beta/\sigma)}$, and is clearly different from the conditional expectation from an OLS, E(y|x)=x'β.[4]

To correct the potential bias, the likelihood function should be augmented to encompass the information that the underlying distribution of disturbances is censored at some threshold. The complete likelihood is composed of censored and uncensored observations. We observe censored observations with probability Pr(y=0|x)=1-Φ(z), whereas the likelihood for the uncensored observations is, as usual, $f(y) = \frac{1}{\sigma}\phi\left(\frac{y - x'\beta}{\sigma}\right)$. The complete likelihood is then

$$\ln L = \prod_{y>0} f(y) \prod_{y=0} \ln\left(1 - \Phi\left(\frac{x'\beta}{\sigma}\right)\right) \tag{2}$$

where the first term on the right hand side of (2) is for non-censored observations, whereas the second part is for censored observations.[5] Overall when censored observations is a high share of the total sample or when we are interested in elasticity, the information contained in the zero expenditure case is important. For these reasons, in order to avoid possible sources of inconsistency in the estimates of the coefficients of interest, in the empirical analysis we will prefer a Tobit model. A drawback with the standard Tobit is that if the underlying disturbances are not normally distributed, the estimator, which

[4] Moreover, the marginal effects are: $\frac{\partial E(y \mid x)}{\partial x} = \beta\Phi\left(\frac{x'\beta}{\sigma}\right)$, which intuitively clarifies that in the OLS the bias of the coefficient β depends on the share of censored observations with respect to the total sample while, at the same time, it suggests that the tobit model is similar to the Maximum Likelihood times the proportion of non censored observations in the sample, which is an empirical regularity found in application.

[5] The OLS is routinely employed in these applications: an empirical regularity is that the OLS point estimates are smaller in absolute values than those from Tobit method; nevertheless, consistent ML estimates are usually well approximated by dividing the OLS estimates by the proportion of non censored observations in the sample (Greene, 2003). This is reassuring in cases where we neglect the censoring.

strongly relies on distributional assumption, is itself inconsistent. The cure would then be either change the underlying distributional assumption, which is not always a sensible procedure to follow since once again it relies on other distributional assumptions, or use a non-parametric estimator, which has heavy complications related to the implementation of the estimator. One approach that avoids any distributional assumption is the quantile regression (Koenker and Bassett, 1978) that we use as robustness check.

**3.2. The panel dimensionality.** The above discussion supports the use of a Tobit model to consider the zero expenditure truncation. The other feature of interest is the unobserved heterogeneity. In order to explore it, we exploit the panel dimensionality. The reference model is similar to equation (1).

$$\begin{cases} y^*_{it} = x'_{it}\beta + z'\alpha_i + \varepsilon \\ y = 0 \quad if\ y^* \le 0 \\ y = y^* \quad if\ y^* > 0 \end{cases} \tag{3}$$

where the new component $z\alpha_i$ is the individual effect, or heterogeneity. The estimation of the model is standard, but not straightforward. The first problem is whether we should consider the fixed effect or the random effect approach. The problem is important because the random effect estimate is consistent only under the strong assumptions than the fixed effect estimate, namely, that the individual effects are mean independent of observed covariates x; however, if these conditions are met, the random effect model is also more efficient than the fixed effect model. This is crucial for testing the appropriateness of the former with respect to the latter and shall be analysed through the Hausman (1978) test.

**3.3 The Mundlak correction.** Because the source of inconsistency of the random effect is due to a non-zero relation between the x and the α, an approach that explicitly considers the relation between them would purge the source of inconsistency; such relation can be expressed as

$$\alpha = x\pi + w$$

where π is the coefficient for the relationship between the x and the αs, and would be zero if their relation is zero. Accordingly, the model specification becomes $y = x'\beta + K(x'\pi + w) + \varepsilon$, with K(.) being the projection matrix of the individual effects. A simple correction amounts to inclusion of those variable which are likely to be correlated with individual random effects (Mundlak, 1978), with the exclusion of those variables that are fixed over time (for obvious multi collinearity problems). An aspect that we consider particularly important is the interpretation of coefficients attached to each z. They "can be thought of as representing the permanent change in the relevant variable, i.e. the level effect while the time varying variable captures a transient change or shock effect" (Datta Gupta and Kristensen, 2008).

Thus, thanks to this correction, we can distinguish between temporary/contingent and permanent effects, where the correction terms are referred to the permanent ones.

In the next section we will use these results to study the per capita cultural expenditures of the Italian municipalities. In particular we present all the results only in terms of a Tobit model approach in order to consider the censoring at zero. As a robustness check we also estimate an OLS and a median regression on the same model specification. We first estimate a pooled regression, and take care of the time dimensionality through a set of time dummies. Given that more robust techniques are available to control for the time dimensionality, we introduce the panel dimensionality, while preserving the information from the censoring at zero (the Tobit). Exploiting the panel dimensionality to estimate a Tobit model requires particular attention to the model specification, because there is no sufficient statistic that allows the fixed effects to be conditioned out of the likelihood; hence the Tobit model with panel data is a random effect model, that is itself inconsistent if individual effects are not mean independent of observed covariates x. To solve the issue we introduce the Mundlak correction.

## 4. Results

We study the per capita cultural expenditures of the Italian municipalities as a function of observable characteristics and unobservable heterogeneity. We do this in several steps. (i) On the basis of a pooled regression that includes the variables capturing the local cultural supply, the economic course, regional and temporal dummies, we focus on the characteristics of the local government and of the population. (ii) Focusing on a shorter length of time, we study the impact of immigrants on the per capita cultural expenditure. (iii) We exploit the panel dimension in order to explore the issue of unobservable heterogeneity. With this approach we distinguish the effects due to transient and permanent changes in the covariates.

### 4.1 Pooled regression, controlling only for observable characteristics

In Table 5 we estimate the per capita expenditure for culture in real terms as a function of various sets of covariates. The first set of covariates is for the traditional determinants of cultural expenditures that might be relevant at a local level: the per capita cost of libraries (purged from possible endogeneity), the number of theater seats, number of museums, number of performances of various type (broadly defined – including those summer cultural events, “the white nights” and the like….). We control for the economic course of the municipality through a polynomial of second degree in GDP. The political bargaining inside the council is considered through a set of characteristics of the council itself and of its components: the

features of the council are related to the period in power, the electoral year and whether the council is at its first or second mandate; the features of the components of the council are referred to socio-demographic individual characteristics of the mayor and each councillor. We also control for the demographic structure of the population, in particular for the population size and for the distribution by gender (share of men in the municipality). Moreover, for a shorter period (2002-2006), we shall distinguish immigrants from non-immigrants, to test whether immigrants increase the cost sustained from the entire society (for culture, in this case). Finally, although not reported, we always control for a set of regional dummies and year dummies.

Each regression is estimated for different bands of population size of the municipalities, as those already used for sample statistics: the first class is up to 5,000 inh., the second includes 5,000-10,000 inh., the third 10,000-50,000 inh., the fourth is over 50,000 inh. and the last is for those municipalities which are administrative capitals of provinces. This distinction conveys interesting information, because, likely, municipalities with different population size behave differently.

In Section 3 we noticed that a possible simultaneity bias might arise between unit cost of libraries and cultural expenses, which we solved instrumenting the current cost of libraries with its past values. This is a good instrument because expenses for libraries tend to be stable over time, while not affecting the current total per capita expenditure for culture by construction of the balance sheet; moreover the F-statistics from first stage regressions are particularly high (Bound, Jaeger, Baker, 1995).[6]

Before commenting our results, we highlight that the share of censored observations is remarkably high in smallest municipalities (about 15%) and very low in other population size municipalities (below 2%). However, municipalities with less than 5,000 inh. are about 72% of the total sample, thus the correction is in fact substantial. Our results are in Table 5, where significance levels are based on estimated asymptotic standard errors that are robust to heteroskedasticity and to clustering arising from the panel structure of the data.

[6] We prefer an instrumental variable (IV) approach because the formal statistical test sometimes rejects sometimes does not reject the null hypothesis that both, standard and IV Tobit estimates, are consistent (Hausman, 1978). However, while IV estimates are consistent under the null and under the alternative hypotheses, the OLS estimates are inconsistent under the alternative, which is the decisive argument in favor of the IV approach. The F-statistic test is always above 100, no matter the population band, the model specification or the estimation strategy.

**Table 5: Estimated coefficients for per capita cultural expenditures by population size. IV-Tobit model (1998-2006).**

| | Inhabitants | | | | |
|---|---|---|---|---|---|
| Variable | <5,000 | 5-10,0000 | 10-50,000 | >50,000 | Ad.Capital |
| Libraries exp. | 1.127*** | 1.061*** | 1.075*** | 0.944*** | 0.802*** |
| Theater | -0.000 | 2503.849*** | 440.928*** | 22.298 | 314.021*** |
| Museum | 357.017*** | -88.920 | -418.683 | 1.64e+05*** | 1.83e+05* |
| Show | -0.000 | 3584.090* | -0.342 | -1.28e+05*** | 24830.413 |
| Population | 0.075*** | 0.018*** | 0.009*** | 0.001 | 0.000 |
| Share Men | -22.137*** | -81.279*** | -96.818*** | -273.144*** | -629.880*** |
| GDP | 0.003*** | -0.001 | -0.003*** | -0.009*** | -0.001 |
| GDP sq. | -0.000 | 0.000 | 0.000*** | 0.000** | -0.000 |
| Woman | -21.796 | 31.592 | -20.373 | -106.794 | -410.208*** |
| Age sq. | 0.001*** | 0.001*** | 0.001*** | 0.003* | 0.001 |
| Age | -2.208*** | -2.207*** | -2.276*** | -5.108* | -1.327 |
| Basic Edu. | -29.366 | 75.008** | 62.256* | 28.811 | -240.728* |
| Secondary Edu. | -102.835*** | -14.889 | -25.409 | 410.799*** | -300.843 |
| Upper Edu. | 130.045*** | 49.648 | -175.636*** | | 163.485 |
| Women Cabinet | 29.225*** | -2.276 | 10.949 | 36.862 | 54.567* |
| Age Cabinet sq. | -0.000 | -0.000** | -0.000 | 0.000 | 0.000 |
| Age Cabinet | 0.251* | 0.357* | 0.010 | -0.440 | 0.049 |
| Length Power sq. | -17.232*** | -6.647 | -4.323 | -19.698 | 4.278 |
| Length power | 15.524*** | 20.298*** | 19.233*** | 40.576** | 51.301** |
| Second | 57.962*** | 27.219* | 38.740** | 51.886 | 25.365 |
| Before Election | 31.719** | -0.087 | -2.020 | -7.245 | 69.755 |
| Region | YES | YES | YES | YES | YES |
| Year | YES | YES | YES | YES | YES |
| Constant | 1073.746*** | 4252.808*** | 5194.243*** | 14128.743*** | 31566.673*** |
| Statistics | | | | | |
| N | 43410 | 8837 | 7016 | 387 | 774 |
| ll | -6.3e+05 | -1.3e+05 | -1.0e+05 | -5326 | -11718 |
| N_lc | 7139 | 93 | 49 | 1 | 11 |
| N_rc | 0 | 0 | 0 | 0 | 0 |
| N_unc | 36271 | 8744 | 6967 | 386 | 763 |

legend: * p<.1; ** p<.05; *** p<.01

First, for larger municipalities, ceteris paribus, the per capita cultural expenditure is higher. Because each additional service provided to residents is costly, the estimated coefficients for these services are positive (those negative are not significant at 10% confidence interval). The impact of libraries on the per capita cultural expenditures is rather limited although the coefficient is decreasing in the population size of the municipalities, with the greatest impact in the smallest municipalities and the smallest impact in administrative capital of provinces. As for all the other services, theaters, museums and performances of various type are the most important. Their impact varies depending on the size of the population, which empirically motivates our choice of distinguishing municipalities by population size. As for theaters, with the exception of the smallest municipalities, the larger the population size, the smaller the cultural expenditures due to theaters. This is not surprising because theaters are characterized by remarkably high fixed costs. The coefficients attached to museums is significant and high for big population size municipalities because of their higher number of museums than in smaller municipalities. For the smallest municipalities, the impact is significant but smaller than for the largest. One likely reason is that in small municipalities museums might be open few days a year (museums are temporary in small municipalities), thus fixed costs associated to museums are small. In medium size municipalities, the coefficient is non significant.

The population structure has an impressive impact on cultural spending. No matter the population size and geographical location, women increase the cultural expenditures more than men do. This effect becomes remarkable in the largest municipalities, as shown by the coefficients attached to the share of men that get larger, in absolute values, as going from the first to the last class of population size. There are two possible explanations for this. One is that women pay more attention to future generations. The other is that in Italy the share of women graduated (mainly in humanistic branches) is higher than the share of men,[7] therefore their demand for cultural services are higher with a likely increasing effect in those places where the per capita cultural spending is higher (that depends on culture being a superior good and therefore a kind of attractor for its own demand).

The GDP profile is important for medium (10,000-50,000 inh.) and big municipalities which are not administrative capitals of provinces. The estimated coefficients suggest that the higher the GDP, the higher the per capita cultural expenditure, whereas for the smallest municipalities the leading term is the linear term of the second degree polynomial which is positive, thus in smallest municipalities the higher the GDP the higher is the per capita cultural expenditure, but with a smaller impact. In administrative capitals of provinces, the GDP course is not very significant for the per capita cultural expenditure (it is worth noting that our sample period does not cover the financial crisis of years 2008 and 2009).

We argued above that the political bargaining for budget allocation is crucial for the final outcome. We have detailed information from the Italian Minister of Internal Affairs regarding each individual municipal government. These information are about age, gender and education of the mayor, and of each component of the council. For the council we can also exploit the length in power, whether first or second mandate and electoral year, whereas the information about the political party, even though provided, cannot be employed because, as mentioned, most of the parties are local/civic aggregations and we know nothing about their true political orientation.

Among personal characteristics, age and education of the mayor play some role, with different impact across municipalities of different population size, even though, in the administrative capitals of provinces, the personal characteristics of mayor are not very significant, whereas the characteristics of the council, in particular the length in power (see below) is the most explicative. This suggests that in these municipalities the local public choice results from political bargaining rather than from personal features of the local administrators as it seems to occur in the small municipalities. As for the councillors, a higher number of women increases the total expenditures for cultural services, but only in smallest municipalities and in administrative capital of provinces. The average age of councillors increases the

[7] According to last release of ISTAT (2007), of about 15,000 graduated students in humanistic branches in year 2001, more than 75% were women.

cultural expenditure in smallest and medium size municipalities, but the profile is steeper for the latter where there is no gender effect.

The main message from this set of covariates is that for per capita cultural expenditures, in smaller communities, personal characteristics, overall of the mayor, result more important than the political bargain, whereas for the administrative capital of the provinces the opposite occurs (as shown in Delle Nogare and Galizi, 2009).

As for the length in power of the local administration and the electoral year, notice that the former is relevant in all the municipalities, but it is more important in the administrative capital of provinces, where the estimated magnitude of the effect on cultural spending is larger. The evidence that the cultural spending increases with the length in power is coherent with two different, not necessarily exclusive, hypotheses: on the one side, the cultural spending gives visibility and therefore it might be of help for re-election; on the other side, cultural spending might not be considered a priority with respect to other duties of the municipal council. In order to investigate which is the prevailing effect, we control for the second mandate of the council (low priority of cultural spending) and for the year before election (re-election motivation). The former indicator is significant in smallest and medium size municipalities (up to 50,000 inh.). In these cases, the result seems to be in favour of the hypothesis that cultural expenditures constitute a low priority for the local government and it is a municipal duty that follows the others. Beside this, we test whether the councils attract the electorate by means of cultural expenditure: the year before election is significant to determine the final per capita cultural expenditure only in the smallest municipalities. The result is strong enough, because the sample covers at least two electoral mandates, in all the Italian municipalities. The significant coefficient for the smallest municipalities on this parameter signal that for smallest municipalities there is a strategy of re-election throughout cultural activities.

Focusing on a shorter length of time, we can test the role of immigrants (Table 6). Detailed data on immigration are released by the ISTAT only since 2002. We estimated the previous model specification, augmented with the number and the gender composition of immigrants. The coefficients attached to the number of immigrants can be zero (the number of immigrants has no effect on the cultural per capita expenditure) or different from zero. In the latter case, we interpret the coefficient in terms of demand for cultural services by the immigrants: if it is scarce, then the *per capita* cultural expenditure decreases as the number of immigrants increases (due, for example, to private networks of immigrants the cultural expenditure is the same, but the population size is higher, thus the share decreases); if the demand made by immigrants is high, the per capita cultural expenditure increases to match the demand for these goods and services (due for example to a deep interaction between migrants and non-migrants).

**Table 6: Estimated coefficients for per capita cultural expenditures by population size. IV-Tobit model controlling for immigrants (2002-2006).**

| | Inhabitants | | | | |
|---|---|---|---|---|---|
| Variable | <5,000 | 5-10,0000 | 10-50,000 | >50,000 | Ad.Capital |
| Libraries exp. | 1.095*** | 1.005*** | 1.038*** | 0.992*** | 0.735*** |
| Theater | -0.000*** | 2691.990* | 313.435*** | 36.521 | 234.884*** |
| Museum | -40.709 | 2805.721*** | -438.849 | 1.66e+05*** | 2.83e+05*** |
| Show | -0.000 | 2388.745* | 5.158 | -2.11e+05*** | 2630.665 |
| Woman | -34.406 | 9.722 | -27.948 | -184.979 | -487.224*** |
| Age sq. | 0.001*** | 0.002*** | 0.002*** | 0.006** | 0.002 |
| Age | -2.713*** | -3.259*** | -3.325*** | -10.701** | -4.473 |
| Basic Edu. | -22.250 | 58.495 | 38.571 | 260.830* | -34.691 |
| Secondary Edu. | -121.989*** | 7.487 | -51.220 | 453.905*** | -313.646 |
| Upper Edu. | 111.726** | 126.617** | -198.849*** | | |
| Women Cabinet | 39.794*** | 7.524 | 17.068 | 77.759** | 79.232*** |
| Age Cabinet sq. | -0.000 | -0.000** | 0.000 | 0.000** | -0.000 |
| Age Cabinet | 0.362* | 0.551** | -0.063 | -0.820** | 0.596 |
| Length Power sq. | -6.800 | -0.974 | -2.765 | -5.060 | 1.347 |
| Length power | 19.638*** | 18.640*** | 17.877** | 36.320* | 52.189** |
| Second | 38.877*** | 30.045 | 70.847*** | 92.814 | -17.287 |
| Before Election | 6.787 | -25.576 | -0.600 | 43.131 | 26.788 |
| Population | 0.070*** | 0.013* | 0.008*** | 0.003 | 0.000 |
| Share Men | -18.937*** | -98.342*** | -128.772*** | -341.343*** | -642.272*** |
| Share Imm. | 67.725*** | 32.117 | -3.055 | -591.829*** | 183.104 |
| Share Imm. Men | -108.320*** | -14.998 | 56.067 | 1054.750*** | -332.260 |
| GDP | 0.003*** | -0.002** | -0.003*** | -0.011*** | 0.001 |
| GDP sq. | -0.000* | 0.000* | 0.000*** | 0.000*** | -0.000 |
| Region | YES | YES | YES | YES | YES |
| Year | YES | YES | YES | YES | YES |
| Constant | 842.147*** | 4986.657*** | 6541.716*** | 17139.278*** | 32084.955*** |
| Statistics | | | | | |
| N | 27244 | 5568 | 4441 | 241 | 477 |
| ll | -4.0e+05 | -84561 | -64214 | -3186 | -7099 |
| N_lc | 4137 | 54 | 25 | 0 | 7 |
| N_rc | 0 | 0 | 0 | 0 | 0 |
| N_unc | 23107 | 5514 | 4416 | 241 | 470 |

legend: * p<.1; ** p<.05; *** p<.01

Our test on the impact of immigration requires a detailed answer. In general, the view that immigrants increase public expenditures, at least for culture, is rejected. This is an important result, because it is usually thought that immigrants free ride on native as for public supplied goods and services, which is one of the main reason against increasing inflow of immigrants. Nevertheless, a further important distinction occurs by geographical location (not reported). It turns out that for different population sizes of the municipalities, the share of immigrants is largely irrelevant in all the areas but in the central Italy (e.g., Abruzzi, Latium, Marche, Tuscany, Umbria), where immigrants lower the per capita municipal expenditures for culture; when the population size is greater than 50,000 inh., apart from islands, the higher the share of immigrants the lower per capita cultural expenditures. The immigrants actually increase the capital expenditure in the smallest municipalities, where the per capita amount goes from 50 euros for Northern-West regions to 150 euros for Southern regions. In the municipalities that are administrative capital of the provinces, the estimated coefficient is largely non significant. We find this result quite interesting because it rejects the common view of immigrants as free riders on public supply.

An important part of the story would be enclaves of immigrants (Wilson and Porter, 1980) [8] on which, however, with the available data we cannot say anything and nonetheless they would not imply a free riding on the non-immigrants population. Ethnic enclaves in this context would be coherent with a scarce demand by immigrants of Italian cultural services.

### 4.2 Panel regression, controlling for observable and unobservable characteristics

Thanks to the richness of the data, the explanation of per capita cultural expenditure as function of these covariates is a novelty with respect to the existing literature. Nevertheless, we do not know whether and how the results are driven by observable or by unobservable characteristics. Moreover, we miss an important part of the story as far as we are unable to distinguish the effect due to a permanent change of covariates from the effects due to a transient change (Datta Gupta and Kristensen, 2008). In this section we try to identify these effects.

Using appropriate techniques, the panel nature of the data allows us to disentangle the individual unobservable heterogeneity from the observable effects of the covariates. We use again a Tobit model as a cure for the zeros, which however relies on the assumption of normal distribution of residuals, whose non-linearity is particularly troublesome when estimating panel data fixed effect models (because there is no sufficient statistic that "eliminates" the individual fixed effects). This limits our choice to discern between fixed and random effects, but also, and more important, it might invalidate the consistency of our estimates. In fact, when the model is properly specified, the distinction between the two estimators is inessential.[9] For this reason, under the (admittedly strong) assumption of correctly specified model, we estimate a Tobit model, augmented for the Mundlak correction. It basically consists of the inclusion of individual mean of the (time varying) regressors that might be correlated with the individual random effects (see Section 3). As a robustness check, to know whether and how biased would be the RE estimator in this application, we also estimate a linear regression model with FE and RE with Mundlak correction included: in all the cases, except for municipalities with population between 5-10,000 inh., we do not reject the consistency of RE specification, based on the Hausman test (1978). This result is reassuring that with this model specification, FE and RE are both consistent, so we are confident in our

[8] An ethnic enclave, is a neighborhood, district, or suburb which retains some cultural distinction from the surrounding area. Typically enclaves flourish around businesses that are run by the members of the community and attract newly arrived immigrants.

[9] In fact, it turns out that "without loss of generality, it can be assumed from the outset that the effects are random and view the FE inferences as a conditional inference, that is, conditional on the effects that are in the sample. It is up to the user of the statistics to decide whether he wants inference with respect to the population of all effects or only with respect to the effects that are in the sample" (Mundlak, 1978, pag.70).

RE corrected as suggested in Mundlak (1978). Moreover, if the RE is consistent, the estimate is also more efficient than the FE estimator.

The point estimates with panel data are in Table 7. The results are reported distinguishing between "short run" and "long run" coefficients that helps in distinguishing between changes in covariates that are temporary or permanent, respectively. It shall be clear that the pooled regression estimates will be valid in the long run, but not necessarily in the short run.

**Table 7: Estimated coefficients for per capita cultural expenditures by population size. IV - Tobit model exploiting panel nature of the data (1998-2006).**

| Variable | fascia0 | fascia1 | fascia2 | fascia3 | fascia4 |
|---|---|---|---|---|---|
| | | | SHORT RUN | | |
| Libraries exp. | 1.240*** | 0.918*** | 1.293*** | 0.735*** | 1.619*** |
| Theater | 0.000 | 628.050*** | 50.671 | -60.546 | 55.250 |
| Museum | 131.760 | 131.436 | 50.642 | -894.855 | 97759.836 |
| Show | -0.000 | 504.055 | -0.264 | -9818.318 | -2.59e+04 |
| Population | -0.114*** | -0.039* | -0.025*** | -0.018*** | 0.001 |
| Share Men | -15.867*** | 32.370** | 18.093 | -51.761 | -322.078*** |
| GDP | -0.006** | -0.002 | 0.004* | -0.013*** | 0.004* |
| GDP sq. | -0.000 | -0.000 | -0.000 | 0.000*** | -0.000 |
| Woman | 5.392 | -2.095 | 27.204 | -168.606** | -89.822 |
| Age sq. | 0.001*** | 0.000 | 0.000 | 0.003*** | 0.002 |
| Age | -1.550*** | -0.578 | -0.479 | -6.626*** | -4.091 |
| Basic Edu. | -21.129 | 18.748 | 21.977 | 0.232 | -19.845 |
| Secondary Edu. | -66.843*** | -28.748 | -0.515 | -61.988 | 17.750 |
| Upper Edu. | 10.023 | -7.476 | -38.093 | | 119.846 |
| Women Cabinet | 9.154 | 2.458 | 0.941 | 16.423 | -8.487 |
| Age Cabinet sq. | -0.000 | -0.000 | 0.000 | -0.000 | -0.000 |
| Age Cabinet | 0.108 | 0.118 | -0.110 | 0.243 | 0.244 |
| Length Power sq. | -12.442*** | -6.517*** | -4.785** | -10.425 | -4.225 |
| Length power | 14.217*** | 15.784*** | 18.770*** | 2.601 | 31.220* |
| Second | 45.720*** | 16.337* | -7.829 | -50.782 | 13.350 |
| Before Election | 69.149*** | 14.254 | 10.450 | -19.407 | 104.727** |
| | | | LONG RUN | | |
| Libraries | 0.275*** | 0.481*** | 0.167*** | 0.737*** | -0.445*** |
| Theater | -0.004 | | 719.299*** | 701.576** | 869.879*** |
| Museum | 471.447 | -2101.679 | -2187.197 | 3.08e+05** | 63717.906 |
| Show | 0.000 | 0.011* | -1.033 | -2.43e+05** | -3.15e+04 |
| Population | 0.183*** | 0.044** | 0.030*** | 0.021*** | -0.000 |
| Share Men | -2.087 | -86.971*** | -71.439*** | -102.315 | -78.972 |
| GDP | 0.008*** | 0.002 | -0.004*** | 0.006* | -0.005** |
| Constant | 794.391*** | 2900.754*** | 2904.706*** | 7687.399** | 19863.676*** |
| Region | YES | YES | YES | YES | YES |
| Year | YES | YES | YES | YES | YES |
| Statistics | | | | | |
| N | 43410 | 8837 | 7016 | 387 | 774 |
| ll | -2.9e+05 | -64598 | -50065 | -2654 | -5900 |
| N_lc | 7139 | 93 | 49 | 1 | 11 |
| N_rc | 0 | 0 | 0 | 0 | 0 |
| N_unc | 36271 | 8744 | 6967 | 386 | 763 |

legend: * p<.1; ** p<.05; *** p<.01

When considering short run changes in covariates the coefficients on libraries and theaters (but only for population size inh. between 5-10,000) are still significant. In contrast to the results from pooled regression, the population has a negative impact, with increasing coefficient from the smallest to the largest municipalities, whereas the share of men has a controversial effect: positive in medium municipalities (5-10,000 inh.), negative in the smallest and in the administrative capitals of provinces and zero otherwise. The polynomial on GDP is significant only in largest municipalities.

When we consider the set of covariates related to the council, which are transient by definition, previous results from pooled regression (Table 5) are confirmed. First, only in the smallest municipalities personal characteristics of the mayor are significant, which is coherent with the view that, in small local communities, the mandate is given to the person rather than to the political groups, which are almost undistinguishable, as instead occurs in the other municipalities where neither the characteristics of the mayor, nor the characteristics of the components of the cabinet affect the cultural expenditures.

Amongst the council's features, the most important is its length in power because the longer the time in power the higher the per capita expenditures, in particular for the smallest municipalities and for the administrative capital of provinces. Could this be interpreted as one way to acquire electoral consent? As in previous models, to answer the question, we control for the second mandate and for the electoral year: they are jointly significant only in the smallest municipalities. The indicator for second mandate (culture as low priority) is significant also in the medium size municipalities (5,000-10,000 inh. at 10% significance level), whilst the indicator for electoral year (culture as attractor of votes) is significant in administrative capitals of provinces.

This result sheds light on the strategic behavior of councils. First of all, the mandate characteristics (whether it is the first or the second mandate) play substantial role only for the smallest municipalities. Second, the practice of spending more for cultural services before the elections, probably as a strategy to attract votes, is followed only in smallest municipalities, where the coefficient attached to electoral year is slightly higher than the coefficient for the second mandate, and in administrative capitals of provinces where the coefficient is remarkably high.

As for the effect of permanent changes of covariates, the Mundlak correction coefficients for libraries can be thought of as the long run impacts of libraries on the per capita cultural expenditures. The higher the expenditures for libraries in the long run, the higher the per capita cultural expenditures, apart from the administrative capitals of provinces. Moreover, for municipalities with more than 10,000 inh., a higher number of theater's seats increases the per capita cultural expenditure as it does a higher number of museums, although only for biggest municipalities that are not administrative capitals of provinces.

Most important are the socio-demographic characteristics of each municipality. From the correction terms, the smaller the municipality the larger the effect of a permanent increase in the population: indeed, as going from smaller to larger municipalities the correction coefficient gets smaller (and it is not very significant in largest municipalities).

As for the economic cycle, a permanent increase in the GDP increases the per capita cultural expenditure in the long run, but only for the smallest municipalities or for those that are big, but not capital of provinces. The estimated coefficient of the GDP is negative and strongly significant for

administrative provincial capital. This support our choice of keeping separate the administrative provincial capitals whose cultural activities are apparently maintained independently of the economic course, exactly because of their mediatic exposure. This might also imply that a permanent increase of the GDP determines a lower need for public spending which can be substituted by private expenditure.

Quite interestingly, once the distinction between short run and lung run changes in the covariates is done, the coherence between pooled regression and panel approach is re-established. We stress on this distinction because it is usually neglected in empirical applications; furthermore, the Mundlak correction supports the view that the long run plays an important role, whereas transient characteristics are largely irrelevant, something that cannot be said by pooling all the observations.

To sum up the results obtained so far, we have identified different sources of heterogeneity in the decisional process: the services provided, the political bargaining and the population composition, possible distinguishing short run and long run change in the covariates. There is at least one more observable determinant that belongs to the population composition and certainly affects the political bargaining and it is related to immigrants, which we shall analyze below.

By focusing on the restricted sample 2002-2006, we investigate the impact of immigrants taking advantage of the panel structure that allows a distinction between the short and the long run changes in the share of immigrants over the total population. In the following discussion, we devote special attention to the political characteristics and to the structure of the population.

The coefficients are qualitatively similar to the coefficients from the model without controlling for the number of immigrants.

As for the political characteristics, with this shorter sample, the personal characteristics of the mayor and/or components of the cabinet are significant only in small municipalities, whereas characteristics of the council are important in all municipalities, but the big that are not administrative provincial capitals. On the contrary, in the longer period sample, only in the smallest municipalities the hypotheses of low priority of cultural expenditures and of the strategy of cultural expenditures to attract voters are confirmed whereas, unlike previous specification (Table 7), the evidence of a strategic behavior due to the second mandate and the electoral year vanishes, respectively, for medium municipalities and administrative capital of provinces. On this basis, we conclude that the practice of spending more money for cultural services before the elections or to consider the cultural expenditures as having a low priority, is robust to model specifications and to different approaches only in smallest municipalities, whereas in other municipalities there is no clear evidence of this.

Unlike the pooled regression, the point estimates are different when we consider the population characteristics: the indicator for the total population and the indicator for the gender composition are

higher in absolute values with respect to the model without controlling for immigrants, which is a symptom that the immigrant composition plays a non trivial role to determine the final outcome.[10]

**Table 8: Estimated coefficients for per capita cultural expenditures by population size. IV - Tobit model controlling immigrants (2002-2006).**

| Variable | fascia0 | fascia1 | fascia2 | fascia3 | fascia4 |
|---|---|---|---|---|---|
| | | | SHORT RUN | | |
| Libraries exp. | 1.131*** | 0.546*** | 1.135*** | 1.523*** | 0.592*** |
| Theater | -0.000 | 648.452** | -15.105 | 58.229 | 54.784 |
| Museum | -44.405 | 943.680 | -251.487 | 30259.591 | 42590.871 |
| Show | -0.000* | 281.590 | 3.377 | -7.78e+04* | -8.00e+04* |
| Woman | 16.975 | -13.466 | 16.079 | -219.854*** | 88.434 |
| Age sq. | 0.001*** | 0.001* | 0.000 | -0.001 | 0.004* |
| Age | -1.744*** | -1.326 | -0.065 | 1.961 | -7.040* |
| Basic Edu. | -18.768 | 36.473 | 29.427 | 55.258 | 279.281*** |
| Secondary Edu. | -74.404*** | 20.037 | -2.739 | -84.703 | 92.909 |
| Upper Edu. | -25.236 | 8.954 | -82.125 | | |
| Women Cabinet | 14.002* | 10.062 | 3.973 | 27.863* | 18.588 |
| Age Cabinet sq. | -0.000 | -0.000 | 0.000 | -0.000 | 0.000 |
| Age Cabinet | 0.148 | 0.144 | -0.080 | 0.155 | -0.442 |
| Length Power sq. | -5.437** | -1.145 | -2.038 | -7.072 | -7.401 |
| Length power | 21.353*** | 15.815*** | 17.021*** | 12.594 | 52.087*** |
| Second | 25.714*** | 16.586 | -14.617 | -30.581 | 64.737 |
| Before Election | 35.573*** | 10.511 | 9.478 | -0.557 | 29.746 |
| Population | -0.166** | -0.109*** | -0.030*** | -0.002 | 0.001 |
| Share Men | -16.153* | 37.424 | -48.077 | 44.082 | -296.145 |
| Share Imm. | -1.595 | 4.335 | -89.326** | -120.532 | -44.482 |
| Share Imm. Men | -1.196 | 4.732 | 153.240** | 171.115 | 21.801 |
| GDP | -0.011*** | -0.002 | 0.003 | -0.015*** | 0.005*** |
| GDP sq. | -0.000 | -0.000 | 0.000 | 0.000** | -0.000* |
| | | | LONG RUN | | |
| Mundlak -- Libraries | 0.376*** | 0.840*** | 0.289*** | 0.106 | 0.736*** |
| Theater | -0.002 | | 771.243*** | 693.054*** | 792.559*** |
| Museum | 424.059 | -1661.436 | -2565.951 | 2.64e+05** | 36702.791 |
| Show | 0.000 | 0.009 | -1.343 | -1.83e+05* | 64855.986 |
| Population | 0.227*** | 0.115*** | 0.035*** | 0.005 | -0.001 |
| Share Men | 5.296 | -93.439*** | -8.170 | -258.993* | 51.740 |
| Share Imm. | 51.398** | 33.807 | 85.462 | -317.737* | 444.525 |
| Share Imm. Men | -78.759* | -41.211 | -126.426 | 552.789* | -756.062 |
| GDP | 0.015*** | 0.001 | -0.004* | 0.010*** | -0.006*** |
| Region | YES | YES | YES | YES | YES |
| Year | YES | YES | YES | YES | YES |
| Constant | 456.649 | 2853.761*** | 3063.969*** | 10999.216*** | 11728.081* |
| Statistics | | | | | |
| N | 27244 | 5568 | 4441 | 241 | 477 |
| ll | -1.9e+05 | -40516 | -31738 | -1585 | -3487 |
| N_lc | 4137 | 54 | 25 | 0 | 7 |
| N_rc | 0 | 0 | 0 | 0 | 0 |
| N_unc | 23107 | 5514 | 4416 | 241 | 470 |

In general, the coefficients attached to immigrants are irrelevant when the change is in the short run, but are significant when refer to permanent changes of share of immigrants over the total population. Indeed, the correction coefficients of immigrants is significant for the smallest municipalities and for the largest (but not administrative capitals of provinces). However, the impact is quite different. A permanent

[10] To see this more formally, consider the total population (T) as the sum of immigrants (I) and non-immigrants (N); should we estimate the equation of interest $Y=\beta T=\beta (I+N)$, the $\beta$ would be a (weighted) average of $\beta_1$ and $\beta_2$ in the regression $Y=\beta_1 I+ \beta_2 N$, i.e. we would impose the undue restriction $\beta_1=\beta_2$, introducing a bias due to the aggregation of immigrants and non-immigrants. The aggregation bias with this panel approach is exacerbated because of the distinction between short run and long run. In fact, it turns out that if we sum the coefficient of the population within all the models (coefficient from short run with coefficient from long run in panel regression; coefficient of population alone in pooled regression) they are virtually identical across model specifications and approaches, thus the apparent difference of coefficient is the effect of the composition of the population.

increase in the share of immigrants over the total population, increases the per-capita expenditures on cultural services for smallest municipalities; for the largest municipalities a higher share of immigrants actually decreases the per capita cultural expenditures. Accordingly, the impact of immigrants is important for cultural expenditure only when the share of immigrants over total population increases permanently. The expenditure increases only in smallest municipalities, decreases only in big municipalities which are not administrative capitals of provinces and has a non significant impact in all the other municipalities.

We interpret these figures as follows: in the smallest communities the higher the number of immigrants the higher the per capita cultural expenditures, likely because in these context the cultural integration is simpler than in larger communities, where indeed the estimated coefficient is negative. For communities of medium size, the impact is irrelevant whether we consider the short run or the long run.

## 5. Conclusions

In recent years municipal governments have gained positions with respect to central government for the supply of cultural goods and services, not only in the traditional fields of civic libraries, museums and theatres, but also for the organisation of cultural events of various type. We have explored the driving forces of local cultural public spending, also in the view of the relevance that it has assumed for the inhabitants the daily life.

On the basis of a unique dataset referred to all the 8,100 Italian municipalities - regarding their balance sheets, the institutional-political features of the local governments, socio-demographic characteristics and economic indicators -, we have analyzed the determinants of the local expenditures for cultural services by the Italian municipalities in order to explaining the heterogeneity in the local expenditures for culture as a function of observable characteristics, while recognizing that also unobservable heterogeneity might play a role.

Other than the traditional determinants of local public spending related to the goods and services supplied, we focused on two basic elements: one is the composition of the population and one is the bargaining for budget allocation inside the cabinet. Either element is quite important for cultural spending. In particular, it turns out that per capita cultural expenditures increase with the population size, they decreases with the share of men on total population. With respect to the share of immigrants we achieve different results, depending on the size of the municipalities. Economic conditions of the municipalities are relevant in that the local GDP increases the per capita cultural expenditure. Finally, per

capita cultural expenditures are affected by the features of the local government, basically by the length in power, and, at least for smallest municipalities, by the electoral cycle.

However, by means of more refined econometric techniques that preserve the panel nature of the data, we have shown the above characteristics hold basically in the long run. In other words, the per capita cultural expenditure are not affected by transient phenomena, but only by permanent changes.

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## APPENDIX

The data regarding the public cultural expenditure of all the 8,101 Italian municipalities are available from the Italian Internal Minister since 1998 as a part of the municipal balance sheet. The municipal balance sheet since 1998 follows a uniform structure in Italy, on which we find three main pieces of information: demographic, economic and services provided.

The first component in the balance sheet (named "Quadro 1") is related to the demographic information and regards the number of inhabitants, the number of families, the number of districts, etc. Unfortunately, the quality of the data in this part of the document is considered scarce and the figures therein are sometime unreliable if compared with the official statistics provided by ISTAT. For this reason, we decided not to use this source for demographic information, as explained later.

The second component is the most important for the economic indicator of each municipality. It is composed of various items related to revenues ("Quadro 2") and current and capital expenditures (reported in details, respectively, in "Quadro 4" and "Quadro 5"). Expenditure are further divided into twelve functional areas: general administration, justice, local police, public education, cultural services, sport and leisure, tourism, viability and transports, environment, social sector, economic development, productivity services.

The third part of the data is for services offered to inhabitants: most important for this study are (various indicators of) theaters, museums, performances and the like. The quality of this data is a critical issue, because there is no official external source for comparison at a municipal level for all the 8,100 municipalities. The ISTAT releases some data aggregated at provincial level, as it does the Italian Ministry of Culture (MiBAC), but in those cases where the figures differ, one does not know which municipality is responsible for the gap between the two sources and which one is most reliable. We have approached this problem by considering these covariates as measured with errors, in which case our conclusions would still hold (due to the attenuation bias in estimated coefficients).

When possible, as it was the case for the set of demographic information, we have compared the information contained in the balance sheet to external sources. In particular, we matched our dataset with that from the ISTAT to obtain information on number of inhabitants and gender distribution, by single municipality. In so doing we have also recovered the distinction between immigrants and non-immigrants, at least starting from 2002, a distinction not made in the balance sheet. In this respect, notice that a shortcoming of the data released by ISTAT regarding the immigrant distribution, is that we only observe the number of regular immigrants, an aspect that must be borne in mind, although irregular immigrants are likely not to consume the public provided cultural services. Details regarding age are missing, except for year 2001, when there was general census in Italy.

As for the political characteristics, the information comes from the Statistical Office of the Italian Minister of Internal Affairs and is, since 1985, on yearly basis. We refer to the period 1998 onward. The data contain demographic characteristic of each single component of the council and the elected representative, namely, name, gender, date and place of birth, education and job; the connection between individuals and their role is possible through the data pertaining the role in the cabinet of each component (basically whether mayor, councilor or elected representative), the date of election and the political affiliation. Although not explicitly reported, it is easy to exploit this information in order to infer the length in power of the council and the electoral year of each Italian municipality.