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Heterogeneity in the Cultural Expenditures of Municipalities
Evidence from Italian Data (1998-2006)

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Abstract

On the basis of a unique dataset referring to all 8,100 Italian municipalities and providing details of their balance-sheets, local governments' features, socio-demographic and economic indicators, we analyze the determinants of the local cultural expenditures.

We exploit the panel nature of the data to explain observable and unobservable heterogeneity. Other than the traditional determinants, we find that per capita cultural expenditures increase with the population size, but decrease with the share of men over total population; immigrants increase local cultural spending only in the long run. The number of years in power of the municipal council also plays a role.

Keywors: Local public expenditure, cultural expenditure, immigrants, local government choice, Mundlak correction.

JEL codes: H72, Z10, C23.

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1. Introduction

The cultural sector has become the object of new attention in the public economics literature.[1] It is widely recognised as essential for the human capital formation of a country and makes 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 (Toswe, 2010). In Italy two main actors, central government and municipalities, cover about 90% of total public spending for culture (Bodo, 2006; Bodo and Bodo, 2007). As shown in Figure 1, in the years 2005 and 2006 municipalities and central government spent, respectively, about 3.2%-3.3% and 0.34%-0.29% of their own balance sheets on cultural expenditure (Berna Berionni, 2009).

Figure 1. Share of cultural public spending (percentage on their own total balance): Years 2005 and 2006
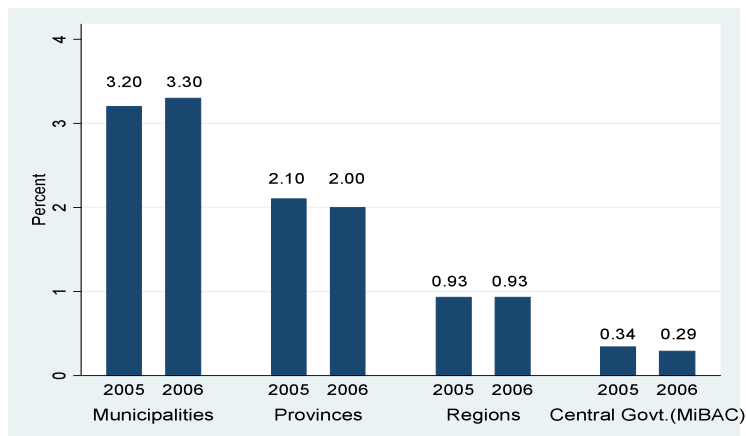
The central government of Italy traditionally plays a major role in the cultural sphere, in that, under the existing legislation, it supervises/protects the nation's artistic heritage. Nevertheless, as far as the overall expenditure for culture is concerned, in recent years the municipal governments have strengthened their position, not only in traditional areas such as the management of civic libraries, museums and theatres, but also through the organisation of cultural events in the field of the performing arts (both heritage and contemporary), which are becoming increasingly important for households' preferences (Figure 2). Therefore, understanding the driving forces of local cultural public spending is also important for its consequences on residents' life.

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[1] See, amongst others, Peacock 1969 and 2004; Santagata, 2006; Schuster, 2006; Throsby, 2001; Toswe, 2003 and 2010; Blaug, 2003, Netzer 1978, 2003 and 2006; Frey 2000 and 2003; Frey and Meier 2006; O'Hagan 2003; Seaman 2003; Baumol 2003 and 2006.

Figure 2. Percentage variation of cultural consumption and hobbies by type of entertainment (1999-2007)
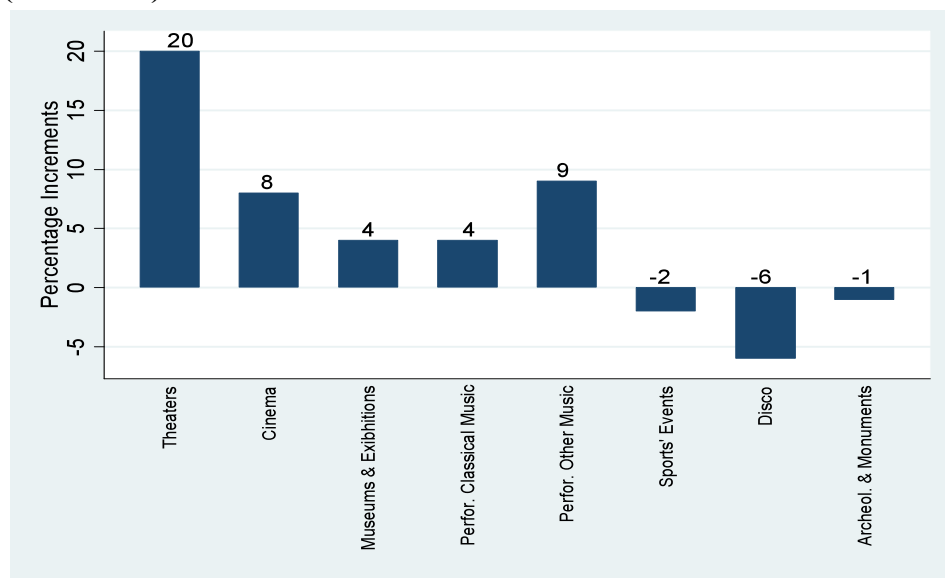
Source: ISTAT – Survey on Housholds - Multiscopo

Here, we concentrate on the determinants of the per-capita cultural current expenditures of all 8,100 Italian municipalities. We take advantage of a rich and detailed dataset composed by the balance sheets of all the Italian municipalities, as provided by the Italian Ministry of Internal Affairs,[2] which has been merged with the demographic and economic data provided by the municipalities themselves as well as by the Italian National Statistical Office (ISTAT). The universe of Italian municipalities is, *per se*, remarkably heterogeneous, being composed of units of different population size, located in different geographical areas, and with quite different historical and cultural traditions. Moreover, given the complexity of the function played by these local institutions and in the absence of usual market signals, municipal spending for culture cannot be properly explained only by the traditional determinants of public spending – for instance as a budget allocation among the different (cultural) goods and services supplied by the municipalities, given population and local income. Indeed, the production of cultural outputs rarely conforms to a production line type technology, where a set of clearly identifiable inputs is used to produce a standard type of output. Rather, cultural spending is broadly tailor-made to the specific needs of individual recipients. Therefore the production process is much less clearly defined and there is also the potential for considerable heterogeneity in what outputs are produced and how this is done. Contributions to the cultural production process are often made by multiple agents or organizations; a "cultural package" might be delivered over multiple time periods and in different settings; and the

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[2] In the balance sheet the total expenditures are broken down into twelve different functional areas, e.g., general administration, justice, local police, public education, cultural services, sport and leisure, tourism, roads and transport, environment, social services, economic development, productive services.

responsibility for delivery might vary from place to place and over time. We shall try to explain the heterogeneity of the local expenditures for culture as a function of observable characteristics, while recognizing that unobservable heterogeneity might also play a role and must somehow be recovered.

Among observable characteristics, when considering local cultural spending two basic elements must be considered: information about different cultural outputs (see section 2 below) and environmental constraints faced in the local decision (including, amongst others, local public choices made as the result of bargaining inside the council, and the composition of the population with respect to gender and citizenship. Dalle Nogare and Galizzi (2009) investigated 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 also provincial administrative capitals) and found that some political variables significantly affect local cultural expenditure. Here, the analysis of cultural spending across the universe of 8,100 Italian municipalities does not allow us to single out a basic political feature of the local governments, namely whether they are left- or right-wing oriented.[3] Nevertheless, the data from the Italian Ministry of Internal Affairs contain detailed information on the composition of each local council as for the age, gender and education of both the mayor, the councilors and other elected representatives. This kind of information is important in order to explain heterogeneity, since very similar municipalities make quite different cultural choices with remarkable different consequences (as we will see below). As for the composition of the population, at least three elements could be important for the final outcome of per capita cultural expenditures: they are the gender, age and citizenship of the inhabitants. The demographic structure of the population might well be relevant for the peculiar type of public expenditures considered. For different reasons, it might be that, for instance, the higher/lower the percentage of women/men in a given area, the higher/lower the cultural expenditures; or the older/younger the population the higher/lower the cultural expenditures. The distinction of the population by nationality is another potentially significant issue. It is usually argued that immigrants tend to free-ride on natives for publicly supplied goods and services, thus increasing their cost for the entire community (Borjas, 1995). In the case of cultural spending, however, the opposite thesis might also be true: difficulties related to integration and cultural differences might lead the immigrants not to consider the public supply of cultural services, relying instead on their own private networks for their (national, religious or ethnic) provision of cultural goods, whatever this might mean. In this study, we will be able to evaluate the impact of immigration on cultural expenditure, although only on a shorter sample period: by considering the share of immigrants in each single municipality (relevant details are available from

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[3] The reason for this is that most municipalities – especially the smallest ones, which are, however, more than the 70% of the total – are run by so called "civic coalitions" of undistinguishable/unidentifiable political "colour".

2002 onwards), we can test whether immigrants actually increase the per capita cultural supply for the local community (i.e., the higher the number of immigrants, the higher the expenditure). If immigrants play no role in cultural spending, or if immigrants rely on their own private networks, then the higher the number of immigrants in the community the lower the per capita expenditure of the population.

Dealing with longitudinal data, we can take into account the unobservable heterogeneity that determines different attitudes towards culture, widely defined, by apparently similar municipalities. As already mentioned, Italian municipalities differ from each other for unobservable (as well as observable) components; these include features such as cultural heritage, which are not easily measurable. In this respect, a major complication arises here because when dealing with censored observations the estimation techniques relating to 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 makes it possible to distinguish between the effects due, respectively, to temporary or permanent changes in the covariates.

The paper is organized as follows: in section 2 we consider some stylized facts showing the peculiar aspects of local public spending for culture; in section 3 we specify the model; section 4 reviews the econometric techniques with which we approach the issue; section 5 reports the empirical results. Conclusions follow in section 6.

2. Some stylized facts

In this section we offer an overview of some relevant factors affecting the cultural supply of Italian municipalities. The main interest is the per capita public expenditure for cultural services (monetary amount deflated by the CPI (2000) as released by ISTAT).[4]

As mentioned above, Italy is a heterogeneous country of about 8,100 municipalities, over a total of 106 provinces. The vast majority of these are quite small in terms of population: about 71% of municipalities have less than 5,000 inhabitants and are also characterized by a different local electoral system. About 15% have a population between 5,000 and 10,000 inhabitants, and 12% have between 10,000 and 50,000, whereas the remaining 2% is over 50,000. Among the latter, those municipalities

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[4] In Italy, the cultural supply 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 (available at http://www.istat.it/dati/catalogo/20081013_01/) are not very helpful for this study, because details are not available for each single municipality. For this reason, we do not refer to them here. Moreover, we discard municipal provision of services for tourism from the analysis, given that, although often related to cultural supply, this is mainly devoted to the financing of touristic attractions targeting temporary visitors and is also widely diversified in each local area. This makes the unitary consideration of cultural supply and services for tourism, for the universe of the Italian municipalities, almost impossible.

which are also provincial administrative capitals shall be considered separately, since they are characterized by different financial features and by higher mediatic exposure.

Figure 3 shows the average per capita public expenditure for cultural services by municipalities of different dimensions. A number of important characteristics emerge from the data. First, 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 capitals. This last group therefore shows a per capita cultural expenditure which is about twice that of the others. However, the variance is about 100-140 euros for all municipalities, but it is 220 euros for the provincial administrative capitals and 240 euros for the smallest municipalities. This means that heterogeneity is important, irrespectively of population size, and that for smaller municipalities it is even more important than for the others. Moreover, cultural supply differs among municipalities not only in relation to their size, but also to their location. As far as geographical heterogeneity is concerned, in Northern Italy (Liguria, Lombardy, Piedmont, Valle d'Aosta, Emilia Romagna, Friuli Venezia Giulia, Trentino Alto Adige, Veneto) the per capita expenditure for cultural services is slightly higher than in Central regions (Latium, the Marche, Tuscany and Umbria), with a difference of about 30-50 euros, and average expenditure of 200 and 170 euros, respectively, in the two areas, 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
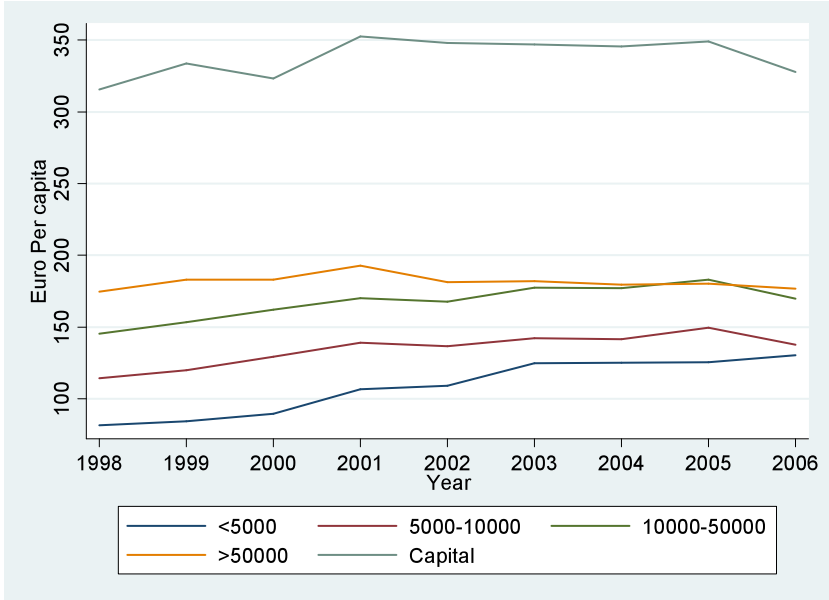
As for types of cultural outputs, we can control for those traditionally supplied by almost all the municipalities, which are libraries, theaters, museums, various types of performances (broadly defined – including summer cultural events, vernissages, exhibitions, film/theater shows, film seasons, "white-nights", 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  |                              Year
of inh.   |  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
-------------------------------------------------------------------------------
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Number of museums open to public

```
----------------------------------------------------------------
Thousand  |                       Year
of inh.   | 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
----------------------------------------------------------------
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Number of performances of various types

```
----------------------------------------------------------------------
Thousand  |                         Year
of inh.   | 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 of the previous table should be emphasized: first, at the beginning of the period there is a much higher level of heterogeneity across municipalities of different population size than in the following years, while over time there is a convergence, for all population sizes, towards closer levels of provision both by number of performances (about 10 performances per municipality in year 2006, as opposed to 38 performances in medium size municipalities or 250 in administrative capitals in 1998) and number of civic museums (2 museums per municipality in year 2006); or at least towards a smaller dispersion as far as the number of theater seats is concerned (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", together with the imposition of limits on local public expenditures.[5] For example, the average number of seats in theaters for cities with more than 10,000 inh. is above 5,000 until 2002; this number was much reduced in 2003, and has stabilized, since 2004, much below 500 seats per municipality. These findings would be coherent with the hypothesis that cultural activities are the firsts to be cut in periods of difficulties for public finances.

Second, apart from convergence, and independently of the specific service under study, 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 provincial administrative capitals, where the average cultural expenditure is the highest, the variance is also the highest. On the contrary, the smallest municipalities, with the lowest expenditure, show quite low variance.

As already mentioned, the final outcome of cultural expenditure is the result of, among other things, decisions influenced by political bargaining at the level of local government. Therefore, it is interesting to look at the composition of councils. We begin with an analysis of the gender, age and education of 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 (both West and East) are led by women, 5% in Islands, and 4.2% in Southern Italy. The average age of a mayor is about 50, with virtually no differences due to geographical area, population size or gender. Finally, the level of education of the mayor is, on average, quite high: in more than 80% of municipalities the mayor is a graduate, with no relevant differences depending on geographical area. As for the composition of the local government, the figures are less dramatic, as can be noted from Table 2 (columns 2 and 3): women are more numerous in councils (14% of total number of councilors are women), and even more so when we consider municipal elected representatives (15 to 20% are women). In Southern Italy, however, coherently with a lower share of female mayors, we also find a smaller share of women in the council and in the assembly.

Finally, the electoral cycle might be relevant to local cultural expenditure. Two aspects are worth noting: length in power and 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 18/8/2000, n. 267*). The distribution of local administrative elections varies remarkably by year and by population size (Table 3). The frequency of administrative elections in small to medium size municipalities (up to 50,000 inh.) has two distinct peaks in years 1999 and 2004 (when

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[5] The Internal Stability Pact came into force in 1999 and was intended to allow monitoring of local accounts by central government. After a few years, in 2002 the public finance crisis imposed a more rigid application of it, including penalties for those municipalities which incurred a budget deficit.

about 60% of municipalities were holding administrative elections), whilst in other years only 10% of municipalities underwent elections. In the biggest municipalities and in provincial capitals there is no distinct peak in the share of elections, because these are related to both local elections and to national political elections (over the period considered, political elections for the Italian parliament took place in 2001 and 2006); thus we observe a slightly higher percentage of municipalities under elections in the years 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 holding local-administrative elections (distribution by years and population size)

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--------------------------------------------------------
          |              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
--------------------------------------------------------
```

Which characteristics of the population affect the demand for cultural services? Different preferences can clearly be associated to differences in gender, age or nationality. Unfortunately, detailed data on the age of the population are not available for each single municipality. 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, at slightly less than 50%, no matter the migration status of individuals. As for the share of immigrants, this is about 3.5-5% in 2006, with an increasing pattern beginning at 1.7-2.9% in 2002, the first year for which there is available data (Table 4); this pattern is common to all municipalities, irrespectively of their size. In general, the figures are quite similar across municipalities of different population sizes, except possibly for 2006. Although the figures are quite close across municipalities of different population sizes, the lowest value is observed in those among the biggest municipalities which are not administrative provincial capitals, followed by the smallest municipalities. The similarity of the figures across municipalities of different population size is particularly relevant to

test whether immigrants increase the per capita cultural expenditure because the assimilation process might be "non-continuous", i.e., there might exist some threshold below which immigrants are welcome and above which they are not. If such a threshold exists, the figures for all the municipalities are close enough to assure us 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 of the municipalities with respect to the threshold.

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

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---------------------------------------------------------
         |              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. The model

We follow the approach used in other areas of economics (for example Jacobs et al (2006) for health care expenditures), which requires the definition of the appropriate unit of analysis to study the output of interest. We focus on Italian municipalities as unit of analysis, distinguishing them by different population sizes in order to gain flexibility, as describe above. Our focus is on per capita cultural current expenditures, conditional on characteristics which relate to:

1. Environmental constraints faced in the decision, E_i, like budget constraints, population's preferences, political bargaining, but also business cycle. In particular, the economic course of the municipality shall be considered through a polynomial of second degree in GDP. Political bargaining inside the council shall be 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 in its first or second mandate; the features of the components of the council are referred to individual socio-demographic characteristics of the mayor and of each councilor. We shall also control for the demographic structure of the population, in particular for population size and for its 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 by the entire society (for culture, in this case).

2. Information about different cultural outputs, W_i. The set of covariates which provide information about different cultural outputs included as explanatory variables are the following: number of theater seats, number of open museums, number of performances of various type (broadly defined –

including summer cultural events, "white nights", etc.), per capita cost of libraries (purged from possible endogeneity, see below).

3. Other likely adjustment covariates not classified above, Z_i. In particular, we always control for a set of regional dummies and year dummies.

These characteristics leads us to the following model specification:

$$Y_i = \alpha + \beta_1 E_i + \beta_2 W_i + \beta_3 Z_i + \varepsilon_i \tag{1}.$$

For later purposes, we denote X the matrix containing E, W and Z, i.e. X=[E,W,Z], and with β the vector of coefficients, i.e. β=[β₁, β₂, β₃].

Each regression shall be estimated for municipalities belonging to different bands of population size; these bands are the same ones already used for sample statistics in section 2. This distinction provides interesting information, because municipalities with different population size are likely to behave differently, due to different agglomeration opportunities (spill-over), congestion problems, economies of scale and so on. The summary statistics of the variables considered here is reported in table 5 below.

Table 5. Summary statistics

Variable	Obs	Mean	Std.	Min	Max
Cultural exp.	70193	1068.11	1244.95	0.00	31373.38
Libraries	70193	500.86	805.55	0.00	31373.31
Theaters	70193	9.04	2392.63	0.00	633902.30
Museums	70193	0.00	0.03	0.00	5.89
Shows	70193	2417.83	368466.90	0.00	56800000.00
Female Mayors	70437	0.08	0.27	0.00	1.00
Age	70347	84.81	258.38	21.00	2006.00
Basic Edu.	70437	0.07	0.26	0.00	1.00
Interm. Edu.	70437	0.13	0.33	0.00	1.00
Bachelor degree or other Higher Edu.	70437	0.02	0.14	0.00	1.00
Women Cabinet	70437	0.69	0.80	0.00	7.00
Age Cabinet	69306	66.85	163.77	25.33	2006.00
Lenght term	70437	1.76	1.34	0.00	5.00
Term	70437	1.33	0.47	1.00	2.00
Beginning term	61508	0.24	0.43	0.00	1.00
Population	62615	7189.17	40204.16	31.00	2705603.00
Share of men (over total population)	70193	49.18	1.55	31.25	66.25
Share of imm.	39236	3.42	2.97	0.00	25.88
Share of imm. – men	39236	1.77	1.70	0.00	14.77
GDP	68680	16224.43	21848.22	1267.10	132149.00

4. Econometric issues

In this section we deal with some econometric issues that are important for our analysis. The figures reported above highlight great variance and heterogeneity in 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 features of the data, including, in particular, the fact that, first, some municipalities have zero expenditure and, second, all the municipalities are observed every year; this 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 use of this model with panel data.

The theory that will 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, which must be purged through Instrumental Variable (IV) for the theory below to be valid. In a non-linear framework, like in the Tobit model, the problem is solved following the classical IV approach, which will not be illustrated here (Amemya, 1974 and Foster, 1997).

4.1. Pooled Tobit estimation

We formalize the above model, equation (1), as follows. We are interested in the relationship between per capita cultural expenditures, y, and a set of covariates, x (recall that in our formulation, X=[E,W,Z]) As usual the vector of disturbances is denoted by, ε:

$$\begin{cases} y^* = x'\beta + \varepsilon \\ y = 0 \quad if \ y^* \le 0 \\ y = y^* \quad if \ y^* > 0 \end{cases} \tag{2}$$

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 an 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

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

where Φ is the cumulative distribution function from a normal density, while $\lambda = \dfrac{\phi(x'\beta/\sigma)}{\Phi(x'\beta/\sigma)}$, and is clearly different from the conditional expectation from an OLS, E(y|x)=x'β.[6]

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, $f(y) = \dfrac{1}{\sigma}\phi\left(\dfrac{y - x'\beta}{\sigma}\right)$. The complete likelihood is then

$$\ln L = \prod_{y>0} f(y) \prod_{y=0} \ln\left(1 - \Phi\left(\frac{x'\beta}{\sigma}\right)\right) \tag{3}$$

where the first term on the right hand side of (3) is for non-censored observations, whereas the second part is for censored observations.[7] Overall when censored observations are 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 strongly relies on distributional assumption, is itself inconsistent. The cure would then be either to change the underlying distributional assumption, which is not always a sensible procedure to follow, since once again it relies on other distributional assumptions; or to use a non-parametric estimator, which has heavy complications related to the implementation of the estimator itself. One approach that avoids any distributional assumption is the quantile regression (Koenker and Bassett, 1978) which we will use as robustness check.

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[6] Moreover, the marginal effects are: $\dfrac{\partial E(y\mid x)}{\partial x} = \beta\Phi\left(\dfrac{x'\beta}{\sigma}\right)$, 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.

[7] 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 the Tobit method; nevertheless, consistent ML estimates are usually closely 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.

4.2. 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 unobserved heterogeneity. In order to explore this feature, we exploit the panel dimensionality. The reference model is similar to equation (2).

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

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 stronger 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 model with respect to the latter and shall be analysed through the Hausman (1978) test.

4.3 The Mundlak correction

Because the source of inconsistency of the random effect is due to a non-zero relation between x and α, an approach that explicitly considers the relation between them would purge the source of inconsistency; such a 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 the inclusion of those variables 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 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 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 we do not have sufficient statistic to allow the fixed effects to be conditioned out of the likelihood; hence the Tobit model with panel data is a random effect model, and as such it is itself inconsistent if individual effects are not mean independent of observed covariates x. To solve the issue we introduce the Mundlak correction.

5. Empirical Results

On the basis of the previous discussion, we study the per capita cultural current expenditures of Italian municipalities modeled in section 3, equation (1), as a function of observable characteristics and unobservable heterogeneity. We do this in several steps. (i) On the basis of a pooled regression, 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 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.

5.1 Pooled regression, controlling only for observable characteristics

In Table 6 we estimate per capita current expenditure for culture, in real terms, as a function of various sets of covariates described in sections 2 and 3. As mentioned in the specification of the model, we follow the approach used in other areas of economics (see for example Jacobs et al (2006)), but we also exploit more refined econometrics techniques, as illustrated in the previous section – equation (2) and equation (4) –, in order to be able to distinguish between a short term and a long term perspective. The specification of covariates can give rise to practical difficulties. We try to control for as many relevant characteristics as possible. As shall be clear, some of the characteristics that we use can be thought of as providing an idea of the short-term perspectives of cultural expenditure, and are beyond the control of the cabinet (Datta Gupta and Kristensen, 2008).

As already mentioned, each regression is estimated for different bands of population size relating to the municipalities; these bands are the same 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 also administrative capitals of provinces.

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 in the construction of the balance sheet; moreover the F-statistics from first stage regressions are particularly high (Bound, Jaeger, Baker, 1995).[8]

Before commenting on our results, we need to point out that the share of censored observations is remarkably high in the 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 6, 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.

Table 6: Estimated coefficients for per capita cultural expenditures by population size. IV-Tobit model (1998-2006).

Variable	<5,000	5-10,0000	Inhabitants 10-50,000	>50,000	Ad.Capital
Libraries exp.	1.127***	1.061***	1.075***	0.944***	0.802***
Theaters	-0.000	2503.849***	440.928***	22.298	314.021***
Museums	357.017***	-88.920	-418.683	1.64e+05***	1.83e+05*
Shows	-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
Women Mayors	-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
Higher 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 mandate	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					
Obs.	43410	8837	7016	387	774
Log.Like.	-6.3e+05	-1.3e+05	-1.0e+05	-5326	-11718
Number of Left Censored	7139	93	49	1	11
Number of Uncensored	36271	8744	6967	386	763

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

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[8] 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 the alternative hypotheses, the OLS estimates are inconsistent under the alternative one, which is the decisive argument in favor of the IV approach. The F-statistic test is always above 100, irrespectively of the population band, the model specification or the estimation strategy.

As mentioned above, 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 (negative ones are not significant at 10% confidence interval). The impact of libraries on per capita cultural expenditures is rather limited, although the coefficient is decreasing with the population size of the municipalities, with the greatest impact in the smallest municipalities and the smallest impact in the administrative capitals of provinces.

As for all the other services, theaters, museums and performances of various types 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 destined to them. This is not surprising because theaters are characterized by remarkably high fixed costs.

The coefficients attached to museums are significant and high for big population size municipalities because of the 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 for this is that in small municipalities museums might be open only a few days a year, thus the 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. Whatever 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, which get larger, in absolute values, as we move from the smallest to the largest bands 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 university-educated women is higher than that of men,[9] therefore their demand for cultural services is higher, with a likely increasing effect in those places where per capita cultural spending is higher (this effect might be due to the fact that culture is 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 here the higher the GDP per capita the lower is the per capita cultural expenditure. For the smallest municipalities, on the other hand, 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. In administrative capitals of provinces, the GDP course is not very significant for per capita cultural

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[9] According to latest data released by ISTAT (2007), among about 15,000 students graduating in humanities subjects in 2001, more than 75% were women.

expenditure (it is worth noting, however, 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. This information concerns age, gender and level of education of the mayor, as well as of each component of the council. For the council we can also consider length in power, whether this is the first or second mandate, and electoral year, whereas information about political formations, even though it is provided, cannot be employed since, as already mentioned, many 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. In general, the impact of age is a reversed U-shape, whereas in the case of education we do not observe a clear cut pattern. Apart from these differences, the relevant result is that in the administrative capitals of provinces, the personal details of the mayor are not very significant, whereas the characteristics of the council, in particular its length in power (see below), are the most explicative factor. This result is clearly important because it suggests that in larger municipalities the public provision of cultural goods results from political bargaining rather than from personal features of the local administrators, whose individual coefficients are in fact irrelevant; on the contrary, in smaller municipalities the personal characteristics of the mayor (with an abuse of terminology, the personality of the mayor) affect the public provision of cultural goods.

As for the councilors, a higher number of women increases the total expenditures for cultural services, but only in the smallest municipalities and in administrative capitals. The cultural expenditure in smaller and medium size municipalities increases with the average age of councillors, but the profile is steeper in medium size municipalities, where there is no gender effect.

The main message from this set of covariates is that as far as per capita cultural expenditure is concerned, in smaller communities, personal characteristics (especially those of the mayor) are more important than political bargaining, whereas for the provincial capitals the opposite occurs (as also shown in Delle Nogare and Galizi, 2009).

With respect to the length in power of the local administration and the electoral year, we can notice that the former is relevant in all municipalities – but especially so in the administrative capitals, where the estimated magnitude of the effect on cultural spending is larger. The evidence showing that cultural spending increases with length in power is coherent with two different, not necessarily exclusive, hypotheses: on the one side, cultural spending gives visibility and therefore it might be of help for re-election; on the other, cultural spending might not be considered a priority with respect to other duties of

the municipal council. In order to investigate which of these 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 the smallest municipalities and in medium size ones (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 are perceived as less important than other municipal duties. Additionally, we tested whether 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. Thus, apart from this specific case, we reject the hypothesis of cultural expenditure as an attractor of votes.

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 signals that for smallest municipalities there is a strategy of re-election through cultural activities.

Focusing on a shorter length of time, we can test the role of immigrants in relation to cultural expenditure (Table 7). Detailed data on immigration started to be released by the ISTAT only in 2002.

Table 7: 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***
Theaters	-0.000***	2691.990*	313.435***	36.521	234.884***
Museums	-40.709	2805.721***	-438.849	1.66e+05***	2.83e+05***
Shows	-0.000	2388.745*	5.158	-2.11e+05***	2630.665
Women Mayors	-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
Higher 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 mandate	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					
Obs.	27244	5568	4441	241	477
Log.Like.	-4.0e+05	-84561	-64214	-3186	-7099
Number of Left Censored	4137	54	25	0	7
Number of Uncensored	23107	5514	4416	241	470

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

We estimated the previous model specification, augmented by 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.

The coefficient can be interpreted as the correlation (an *association,* not a *causation)* between the demand for public cultural goods by immigrants and the actual provision of cultural public goods. The correlation can be zero or different from zero: in cases where it is different from zero, if the "public" demand made by immigrants is low, then the *per capita* cultural expenditure decreases as the number of immigrants increases (due, for example, to private networks among immigrants, the cultural expenditure is the same, but the population size is higher, thus the share decreases) and thus the coefficient would be negative; 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) and thus the coefficient would be positive.

Our test on the impact of immigration requires a detailed answer. In general, the view that immigrants increase public expenditure, at least for culture, is rejected. This is an important result, because it is usually thought that immigrants free ride on native as far as publicly supplied goods and services are concerned, 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 the per capita cultural expenditure. 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 also administrative capitals, 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 related to the presence of enclaves of immigrants (Wilson and Porter, 1980)[10] on which, however, available data do not allow us to say anything. Nonetheless their presence would not imply free riding on the non-immigrant part of the population. In this context, in fact, ethnic enclaves would be coherent with a scarce demand of publicly provided cultural services by immigrants.

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[10] 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.

5.2 Panel regression, controlling for observable and unobservable characteristics

Thanks to the richness of the data, the explanation of per capita cultural expenditure as a function of the above 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 are missing an important part of the story, since we are unable to distinguish the effects due to a permanent change of covariates from those 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. Once again, we use 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 capable of "eliminating" the individual fixed effects). This limits our ability to discern between fixed and random effects, but also, and more importantly, it might invalidate the consistency of our estimates. In fact, when the model is properly specified, the distinction between the two estimators is inessential.[11] For this reason, under the (admittedly strong) assumption of a correctly specified model, we estimate a Tobit model, augmented for the Mundlak correction. This basically consists of the inclusion of the individual mean of the (time varying) regressors that might be correlated with the individual random effects (see Section 4). As a robustness check, to know whether the RE estimator in this application would be biased and how, 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 reassures us that with this model specification, FE and RE are both consistent, so we are confident in our 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 8. The results are reported distinguishing between "short term" and "long term" coefficients, which helps in distinguishing between changes in covariates that are temporary or permanent, respectively. It is clear that the pooled regression estimates will be valid in the long run, but not necessarily in the short term.

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[11] 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).

Table 8: Estimated coefficients for per capita cultural expenditures by population size. IV - Tobit model exploiting panel nature of the data (1998-2006).

Variable		Inhabitants			
	<5,000	5-10,0000	10-50,000	>50,000	Ad.Capital
			SHORT TERM		
Libraries exp.	1.240***	0.918***	1.293***	0.735***	1.619***
Theaters	0.000	628.050***	50.671	−60.546	55.250
Museums	131.760	131.436	50.642	−894.855	97759.836
Shows	−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
Women Mayors	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
Higher 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 TERM		
Libraries	0.275***	0.481***	0.167***	0.737***	−0.445***
Theaters	−0.004		719.299***	701.576**	869.879***
Museums	471.447	−2101.679	−2187.197	3.08e+05**	63717.906
Shows	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					
Obs.	43410	8837	7016	387	774
Log.Like.	−2.9e+05	−64598	−50065	−2654	−5900
Number of Left Censored	7139	93	49	1	11
Number of Uncensored	36271	8744	6967	386	763

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

When considering short term 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, a short term increase in population size decreases cultural expenditure, and the impact is larger the larger the population size. 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, and zero otherwise. The polynomial on GDP is significant only in the largest municipalities. However these are only transitory effects which do not make a difference for the quality of life of the individual.

When we consider the set of covariates related to the council, which are transient by definition, previous results from pooled regression (Table 6) are confirmed. First, only in the smallest municipalities the 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 political groups, which are almost undistinguishable; the opposite occurs in the other municipalities, where neither the characteristics of the mayor, nor those of the components of the cabinet affect cultural expenditure.

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 capitals of provinces. Could this be interpreted as an indication that cultural expenditure is 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 a substantial role only for the smallest municipalities. Second, the practice of spending more for cultural services before the elections, as a likely 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. In other municipalities, neither mandate characteristics nor strategic behavior add information which helps to explain cultural expenditure. As for the effect of permanent changes of covariates, the Mundlak correction coefficients for libraries can be thought of as the long term impact of libraries on per capita cultural expenditures. The higher the expenditure for libraries in the long run, the higher is the per capita cultural expenditures (apart from the case of administrative capitals). Moreover, for municipalities with more than 10,000 inh., a higher number of theater seats increases per capita cultural expenditure, as does a higher number of museums, although only for biggest municipalities which are not administrative capitals of provinces.

Most important are the socio-demographic characteristics of each municipality. From the correction terms, we note that the smaller the municipality, the larger is the effect of a permanent increase in the population: indeed, as we move from smaller to larger municipalities the correction coefficient gets smaller (and it is not very significant in the largest municipalities). As for the economic cycle, a permanent increase in the GDP increases per capita cultural expenditure in the long run, but only for the smallest municipalities or for those that are big, but not capitals of provinces. The estimated coefficient of the GDP is negative and strongly significant for administrative provincial capitals. This supports our choice of keeping separate the administrative provincial capitals, whose cultural activities are apparently maintained independently of the economic outlook, exactly because of their mediatic exposure. This might also imply that a permanent increase in GDP determines a lower need for public spending, which can be substituted by private expenditure.

Quite interestingly, once we make the distinction between short term and long term changes in the covariates, the coherence between pooled regression and panel approach is re-established. We stress this distinction because it is usually neglected in empirical applications; furthermore, the Mundlak correction supports the view that long term factors play 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, political bargaining, and the composition of the population, possibly distinguishing short term and long term changes in the covariates. There is at least one more observable determinant which belongs to the population composition and certainly affects political bargaining; this is related to immigrants, and we shall analyze it below.

By focusing on the restricted sample 2002-2006 (Table 9), we investigate the impact of immigrants taking advantage of the panel structure of the data, which allows a distinction between the short and the long term 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 used in the model which did not include the number of immigrants.

As far as political characteristics are concerned, in this shorter sample, the personal characteristics of the mayor and/or components of the cabinet are again significant only in small municipalities, whereas the characteristics of the council are important in all municipalities, except for big ones which 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 cultural expenditure used as a strategy to attract voters are confirmed; on the other hand, unlike previous findings (Table 8), any evidence of a strategic behavior linked to the second mandate and the electoral year vanishes, respectively, for medium municipalities and administrative capitals. On this basis, we conclude that the practice of spending more money for cultural services before the elections, or that of considering cultural expenditure as a low priority, is robust to model specifications and to different approaches only in smallest municipalities, whereas in all other municipalities there is no clear evidence of this.

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

absolute values with respect to the model without controlling for immigrants, which is a symptom that immigrant presence plays a non trivial role in determining the final outcome.[12]

Table 9: Estimated coefficients for per capita cultural expenditures by population size. IV - Tobit model controlling for immigrants (2002-2006).

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--------------------------------------------------------------------------------------------------
                       |                          Inhabitants
              Variable |   <5,000      5-10,0000     10-50,000      >50,000      Ad.Capital
-----------------------+--------------------------------------------------------------------------
                                               SHORT TERM
        Libraries exp. |   1.131***      0.546***      1.135***      1.523***      0.592***
              Theaters |  -0.000        648.452**     -15.105        58.229        54.784
               Museums | -44.405        943.680      -251.487     30259.591     42590.871
                 Shows |  -0.000*       281.590         3.377       -7.78e+04*    -8.00e+04*
           Women Mayors|  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
            Higher 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 TERM
    Mundlak -- Libraries|   0.376***       0.840***      0.289***      0.106         0.736***
              Theaters |  -0.002                       771.243***    693.054***    792.559***
               Museums | 424.059       -1661.436     -2565.951       2.64e+05*   36702.791
                 Shows |   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             |
                  Obs. |  27244           5568           4441          241           477
             Log.Like. |  -1.9e+05       -40516         -31738        -1585         -3487
Number of Left Censored|   4137             54             25            0             7
  Number of Uncensored |  23107           5514           4416          241           470
--------------------------------------------------------------------------------------------------
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In general, the coefficients attached to immigrants are irrelevant when the change of the share of immigrants is in the short term, but are significant when referred to permanent changes. Indeed, the correction coefficient is significant for the smallest municipalities as well as for the largest (but not for administrative capitals). However, the impact is very different in the two cases: whilst a permanent

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[12] 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 β would be a (weighted) average of β_1 and β_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 term and long term. In fact, it turns out that if we add up the coefficient for the population within all the models (coefficient for the short term, plus coefficient for the long term 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* per-capita expenditures on cultural services for the smallest municipalities, for the largest municipalities the opposite occurs.

We interpret these figures as follows: in the smallest communities the higher the number of immigrants, the higher the per capita cultural expenditure, possibly because in these contexts 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 or the long term.

6. Conclusions

In recent years municipal governments in Italy have acquired a stronger role with respect to central government in the supply of cultural goods and services, not only in traditional fields such as those involving civic libraries, museums and theatres, but also in the organisation of cultural events of various types. Following the approach used in other areas of economics (such as those related to health care expenditure), we have modeled the Italian municipalities' per capita cultural current expenditures in relation to characteristics that encompass the environmental constraints faced in the decision (such as budget constraints, the population's preferences, political bargaining, but also business cycle); information about different cultural outputs (libraries, number of theater seats, number of open museums, number of performances of various types, broadly defined – including summer cultural events, "white nights", etc.); and other adjustment covariates, such as regional dummies and year dummies.

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

Besides the traditional determinants of local public spending related to the goods and services supplied, the other elements considered are shown to be important for cultural spending. In particular, it turns out that per capita cultural expenditures increase with population size, but decrease with the share of men over total population. With respect to the share of immigrants, we have obtained different results, depending on the size of the municipalities. The economic conditions of the municipalities are relevant in that an increase in the local GDP increases per capita cultural expenditure. Finally, per capita cultural expenditures are affected by features of the local government, namely length in power, and, at least for smallest municipalities, electoral cycle.

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

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APPENDIX

The data regarding the public cultural expenditure of all 8,101 Italian municipalities have been made available by the Italian Ministry of Interior since 1998, as a part of the municipal balance sheets. Since that year, municipal balance sheets have followed a uniform structure, which includes three main categories: demographic details, economic information and services provided.

The first component in the balance sheet (named "Quadro 1") is related to demographic information and concerns 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 included 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 profile of each municipality. It is composed of various items related to revenues ("Quadro 2") and current and capital expenditures (reported in detail, respectively, in "Quadro 4" and "Quadro 5"). Expenditures are further divided into twelve functional areas: general administration, justice, local police, public education, cultural services, sport and leisure, tourism, roads and transports, environment, social services, economic development, productive services.

The third part of the data relates to services offered to inhabitants: most important for this study are (various indicators of) theaters, museums, performances and similar cultural services. The quality of this data is a critical issue, because there is no official external source for comparison at a municipal level for all 8,100 municipalities. ISTAT does publish some data, aggregated at provincial level, as 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, nor which of these 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 in the case of the data set concerning demographic information, we have compared the details contained in the balance sheet to external sources. In particular, we matched our dataset with that from ISTAT to obtain information on number of inhabitants and gender distribution, by single municipality. In so doing, we 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 can only observe the number of regular immigrants; this is an issue that must be borne in mind, although irregular immigrants are likely not to consume publicly provided cultural services. Details regarding age are missing, except for the year 2001, when there was a general census in Italy.

As for the political characteristics of the municipalities, the information comes from the Statistical Office of the Italian Ministry of Interior and is released, since 1985, on a yearly basis. We refer to the period 1998 onward. The data contain demographic characteristics of each single component of the council and elected representative, namely, name, gender, date and place of birth, level of education and job; the connection between individuals and their role can be traced through the data pertaining to the role in the cabinet of each member (basically whether mayor, councilor or elected representative), their date of election and 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.

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