

BUDGET CONSTRAINTS AND BORROWING DECISIONS  
OF ITALIAN MUNICIPALITIES

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# BUDGET CONSTRAINTS AND BORROWING DECISIONS OF ITALIAN MUNICIPALITIES

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June 2012

(Provisional version not to be quoted without the authors' permission)

## Abstract

Economic theory suggests that sub-national governments borrow money essentially for three main reasons: i) for intergenerational equity purposes to finance investment expenditure; ii) for tax smoothing, in order to avoid abrupt changes in tax rates (or expenditure); iii) to maximize the probability to be re-elected (political budget cycle).

Using a panel data set for Italian municipalities for the years 1998-2007, we empirically test the validity of these hypotheses and, moreover, we verify the effectiveness of the quantitative limits on municipalities borrowing imposed by Italian law.

We find evidence that Italian municipalities borrow primarily to finance investment expenditures and, consequently, "fiscal illusion" (defined as borrowing to finance current expenditure or debt rollover) doesn't appear a relevant issue. We also find evidence of tax smoothing when municipalities face deviations of investment expenditure from the medium and long term average. The hypothesis of a political budget cycle is confirmed by our data that show a debt increase in the elections year. Finally, quantitative constraints imposed by the law seem not to be effective in containing borrowing.

## 1. Introduction

The budget constraint of a local authority can be summarized as follows:

$$\underbrace{CE + KE + FE}_{TOTAL\ EXPENDITURE} = \underbrace{CR + KR + FR}_{TOTAL\ REVENUE} \quad (1)$$

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where CE is the current expenditure, KE is the capital expenditure, FE is the financial expenditure, CR is the current revenue, KR are the capital revenues and FR are the financial revenues.

The “Ricardian equivalence” (see Barro, 1974) suggests that, under certain (very strict) assumptions<sup>1</sup>, the way public expenditure is financed – by taxes or debt – does not affect the inter-temporal profile of individuals’ consumption choices. Whenever public debt goes up, rational agents reduce their current consumption (or increase saving) to transfer to future generations the resources to cope with higher taxes (or lower services) to pay back the debt.

For municipalities, since property taxes are usually the main source of their fiscal revenues, a pivotal role in the functioning of the Ricardian equivalence is played by the real estate market (Daly, 1969; Akai, 1994). In fact, if a municipality increases its debt (instead of imposing new taxes) to finance certain expenditures, the value of the houses in that area would decline of an amount equal to the present value of the new debt. In other words, individuals contribute to finance those expenditures through the new taxes or through the reduction in the market value of their houses.

Since the Ricardian equivalence does not seem to hold in practice<sup>2</sup>, it is important to understand the reasons behind the borrowing (and taxation) choices of local governments. For this purpose can be useful to re-express the municipal budget constraint as follows:

$$\underbrace{D}_{\text{NEW DEBT}} = \underbrace{(KE - KR)}_{\text{CAPITAL EXPENDITURE NET OF CAPITAL REVENUE}} + \underbrace{(CR - PCE)}_{\text{CURRENT PRIMARY SAVING}} + \underbrace{(IE + DR)}_{\text{DEBT SERVICE EXPENDITURE}} \quad (2)$$

where D is the new debt contracted in a given period, PCE is the primary current expenditure, IE is the interest expenditure and DR is the debt repayment. The new debt is thus equal to the excess of capital expenditure with respect to capital revenue, net of the current primary saving (CR-PCE), plus the debt service expenditure.

In this paper we analyse Italian municipalities’ borrowing choices and test empirically the hypotheses suggested by the economic theory to justify borrowing decisions of sub-national governments. Although

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1 These assumptions can be summarized as follows: i) the economy is populated by perfect altruistic individuals, ii) who have complete information about the current situation of the state of the public finances and iii) can borrow/lend money at the same conditions of the government; iv) the value of the expenditure programs does not depend on the way they are financed.

2 The reasons can be different. First, the agents’ behaviour is usually not as altruistic as implied by the model à la Barro. Second, the government could be not benevolent, rather than trying to maximize the social welfare, it could pursue other goals, such as maximizing the probability of re-election. Third, public bodies can usually borrow at more favourable conditions than private individuals. Finally, agents may not have complete information on all relevant variables (for example, they may not be aware of the level of indebtedness of the municipality; see Oates, 1988).

the empirical evidence is quite rich for other countries<sup>3</sup>, at our best knowledge this is the first work of the kind for Italian municipalities.

The rest of the paper is organised as follows. Section 2 reviews the main theoretical contributions of the economic literature on sub-national governments borrowing. Section 3 summarizes the legal system governing the borrowing decisions of Italian municipalities, while Section 4 shows the recent trend in Italian municipalities' debt. Section 5 describes the data set we have used and section 6 presents the econometric estimates and the main results. Section 7 draws the main conclusions.

## 2. Local governments and debt: some theoretical considerations

From a theoretical point of view, the use of debt to finance local public expenditure can be justified by inter-generational equity and efficiency considerations. As regard the first aspect, equity considerations push towards a mechanism of the kind "pay-as-you-use" (Musgrave, 1959; Wagner, 1970), based on debt, to finance the cost of investments in order to transfer part of the burden to future generations (Oates, 1972). If public investments, that have a long life cycle, were financed solely by the current generation, the future generations would benefit from them without sharing any cost.

About the second aspect (efficiency), the recourse to capital markets allows governments facing a temporary deficit to bridge the gap between revenue and expenditure without increasing taxes above the optimal level (Barro, 1979). Furthermore, whenever deficits are not structural, borrowing reduces the variability of spending, helping to enhance the efficiency of the public sector (Buettner e Wildasin, 2006).

When we abandon the hypothesis of a benevolent government, we have to allow for the possibility that municipal administrators might use borrowing in order to maximize the probability of re-election. The existence of a political budget cycle would determine a borrowing peak in the year of elections<sup>4</sup>. This can be due to different reasons. Firstly, debt can be used to increase expenditure or to cut taxes. Secondly, it can be used to overcome the opposition to new spending programs (Buchanan and Wagner, 1978). Thirdly, the politicians in office, whenever they despair of winning the elections, could behave

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3 Many studies are devoted to Spain, whose system of rules and budget constraints is similar to the Italian one (Vallés and Zárata, 2006; Cabasés et al., 2007; Pascual et al., 2004; Benito and Bastida, 2004). There exists also empirical evidence about the borrowing choices of municipalities of Sweden (Pettersson-Lidbom, 2001), Norway (Borge, 2005; Tovmo, 2007) and Netherlands (Ashworth et al., 2005). For the USA see, inter alia, the paper of Wang et al. (2007).

4 It has been noticed that at local level the political budget cycle should be weaker because of the rules the local governments are subject to (see Bastida and Benito, 2010).

strategically through over-borrowing in order to reduce the room for manoeuvre of the future administrations (Persson and Svensson, 1989).

The possibility for local governments to have access to financial markets is usually coupled with borrowing limits<sup>5</sup> that are aimed at preserving macroeconomic stability and ensuring balanced public finances (Ahmad et al., 2006)<sup>6</sup>.

The lack of specific borrowing limits on local governments could, in some cases, damage the stabilization and consolidation efforts made by the central government. Local governments may be keen to borrow during a recession, but they could be reluctant in reducing their debt during the booming phases, due to the pressure from voters and vested interests to cut taxes or to provide more public services (Buchanam et al., 1987).

The need to impose borrowing limits to local government is clearer when we look at the “common pool” problem (Weingast et al., 1981). In decentralized countries, where there is a gap between the tax revenue and the spending of the local governments, high deficit and debt could be used strategically to signal the need of more transfers from higher government levels.

Furthermore, the existence of an implicit or explicit guarantee from the central government in favour of the local governments’ debt may create moral hazard problems. On the one hand, local governments may be induced to borrow more than it is optimal by the perception of this guarantee (and by the fact that their budget constraints could be ex-post relaxed). On the other hand, banks can be less strict in their scrutiny of the creditworthiness of a specific municipality because of the existence of the central government guarantee.

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5 Borrowing limits can be imposed mainly in three different forms (Cabases et al., 2007). Firstly, through a limit on the resources devoted to the interest payment (or/and debt repayment) or through an explicit limit on the debt itself. Secondly, one can limit borrowing restricting it to finance only investment expenditure or imposing a cap on the share of spending financed through debt. Finally, administrative burdens can be imposed to make debt relatively less attractive.

6 The autonomy recognized to local governments in different countries shows a great variability. In some countries (Germany, Switzerland, Canada, USA) self-regulation plays a major role: local governments themselves decide how to limit the recourse to the financial markets and there is not any guarantee from higher levels of government. In other countries (like most the other European countries) all local authorities are subject to the same set of rules imposed by a central authority that, in most cases, is responsible for the enforcement as well (Kopits 2001).

### 3. The Italian legal framework on local governments borrowing

The economic literature describes two main different institutional models of recourse to financial markets by sub-national governments (Martell, 2003). The first is based on “customer relationship” between local governments and financial institutions while the second is based on “market relationship”. The “customer relationship” model is intended to prevent the default of the local governments by imposing rules and borrowing limits. In the “market relationship” model there are no explicit borrowing limits and it is up to the financial institutions and markets to evaluate the creditworthiness of the local governments and to penalize those which do not have sound finances (Lane, 1993; Ter-Minassian, 2007)<sup>7</sup>.

Countries like the USA and Canada follow a model close to “market relationship”, with markets that play an important role in the allocation of resources. Most of the European countries have systems more similar to the “customer relationship” model, although from the late 1990's there have been changes to strengthen the role of the markets (Swianiewicz, 2004).

The Italian legal framework on local governments borrowing is essentially based on the “customer relationship” model. There exists, in fact, a system of limits and constraints imposed by the central government<sup>8</sup> and the effectiveness of market discipline is greatly mitigated by the existence of a peculiar form of guarantee, the delegation of payment (DP), that minimizes the probability of default of municipalities on financial liabilities.

In 2001 the golden rule for sub-nationals governments was introduced in the Italian constitution: municipalities, and other local governments, can borrow money only to finance investment expenditure<sup>9</sup>. Furthermore, according to the law, the interest expenditure cannot exceed the 15 percent of the current revenues resulting from the budget of two years before<sup>10</sup>.

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7 Market discipline on local governments' behaviour is effective when: i) information about their financial situation are timely and reliable; ii) local governments properly react to the signals coming from financial markets and iii) do not have a concessional access to financial markets; iv) there are not restrictions in the financial markets and there is not lack of transparency; v) the possibility of bailout is ruled out; vi) the local governments' tax base have to be enough large to give the possibility of manoeuvre taxes according to spending programs.

8 For more details about the legal framework on municipalities borrowing, see Barozzetti et al. (2008).

9 The financial law for the year 2004 (Law no.350/2003) has defined the practical aspects (definitions of debt, investment expenditures etc.) of the constitutional principle.

10 Legislative decree no. 267/2000. Thus the interest expenditure of year t cannot exceed the 15 percent of the current revenues of the year t-2. Furthermore, borrowing is banned until the final budget of year t-2 and the provisional budget for year t have been approved. As concerns bonds, they cannot be issued whenever from the final budget of the year t-2 emerges a deficit (law no. 724/1994).

In 1999 the Internal Stability Pact (ISP) was introduced to involve local governments in the pursuing of European targets according to the Stability and Growth Pact. The content of the ISP has changed several times during the years. As concerns the goal of the reduction of local governments debt, both incentives (for example giving the possibility of debt pay back at concessional conditions) or sanctions (for example banning the possibility of new debt even to finance investment expenditure) have been alternatively adopted in the Pact.

The municipalities' debt, both bank loans and bonds, is usually guaranteed by the DP. The DP gives to financial creditors (banks and bond holders) a seniority status with respect to all other creditors<sup>11</sup>. The DP, coupled with the borrowing limits and the small variability of the municipalities' current revenues, does minimize the risk of default on financial liabilities whatever is the budget situation<sup>12</sup>.

#### 4. Italian municipalities debt: recent trends

Until the late 1980's the municipalities' share of Italian public debt was generally negligible<sup>13</sup>. Municipalities' investment expenditure was generally financed by loans from Cassa Depositi e Prestiti (CDP), that at that time was part of the general government, and paid back using the central government transfers (see Bardozzetti et al., 2008).

The system has been changing since the mid 1990's, when Italy has intensified the fiscal consolidation process and the first attempts of devolution have taken place with the decentralization of powers and resources towards the sub-national governments. Since then the municipalities debt gradually has started rising, becoming a relevant issue in Italian public debate.

Italian municipalities can borrow only to finance investment expenditure. Borrowing to finance current expenditure or to rollover pre-existing debt is banned. Although the rules are uniform, there is a great variability in the level of indebtedness of municipalities, variability which is considerably increased in recent years. In 2007 the average ratio between new debt and capital expenditure was equal to 15 percent with a standard deviation of 1.5 the average (Figure 1).

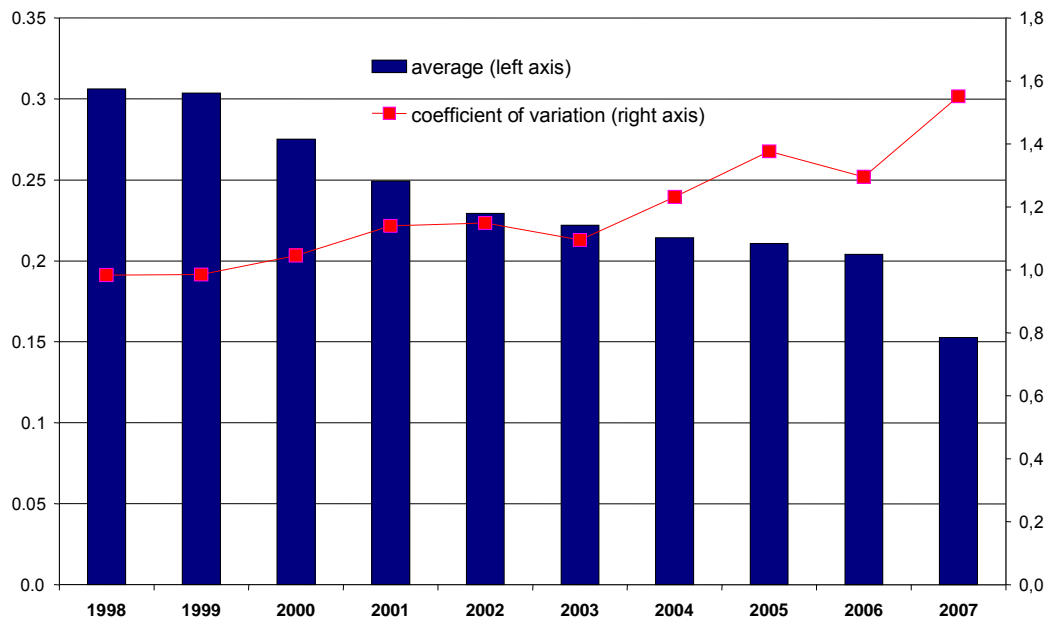
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11 When the DP is notified to the municipality's treasurer, it becomes legally binding and the treasurer is obliged to put aside (out of the current revenues) the amount of money necessary to service the debt.

12 The presence of DP weakens the market discipline. Often interest rates applied to municipalities do not adequately react to their budget situation because markets might not be interested in discriminating between good and bad borrowers due to the presence of DP (see Bardozzetti et al., 2008)

13 With the exception of the interwar era (from the mid 1920's to the mid 1930's) and the years from the mid 1960's to the 1970's (see Francese and Pace, 2008).

Figure 1: Ratio between new debt and capital expenditure



Source: our calculations on data from Certificati di Conto Consuntivo (Ministry of Interior).

From 1998 to 2009 the Italian municipalities debt has risen from €10.8 to €48.4 billion (from 1.0 to 3.2 percent of GDP; Banca d'Italia, 2010)<sup>14</sup>. Although the increase in the stock of debt has concerned all the areas of the country, the level and the dynamic have shown different patterns: during the period between 1998 and 2009 the increase has been particularly sustained in the Centre and in the Southern Italy. In 2009, the municipal debt as a percentage of GDP was equal to 4.1 percent in the Centre, 3.2 in the South, 3.1 in the North-West and 2.5 percent in the North-East. With respect to resident population, the debt was equal to €1,150 in the Centre, €920 in the North-West, €740 in the North-East and €553 in the South.

## 5. The data and variables

The aim of this paper is to empirically test the following hypotheses with respect to Italian municipalities: i) borrowing is used to finance investment expenditure only, in line with the intergenerational equity principle; ii) debt is used to improve the efficiency in the allocation of resources, avoiding abrupt changes in tax rates and spending; iii) the effectiveness of quantitative borrowing limits; iv) the

14 The data in this section are calculated using the methodology established in European Council Regulation 479/2009 (so called "Maastricht" debt). The debt therefore excludes: i) liabilities stemming from the delay in payments related to supplies of goods and services; ii) liabilities that are assets of other general government bodies; iii) loans disbursed to municipalities but that are to be repaid by the state.



existence of a political budget cycle that, according to the economic theory, determines a pick in the debt before the elections in order to reduce taxes and/or increase spending.

We use a panel data for Italian municipalities for the years from 1998 to 2007. Financial variables data come from the “Certificati di Conto Consuntivo (CCC)” data set published on the Ministry of Interior’s web page. The data have been deflated (base year: 2007)<sup>15</sup> and standardized with respect to the resident population. To deal with outliers and to minimize the influence of possible misreporting, we have dropped the data falling in the first and last percentile. Estimates are thus based on an unbalanced panel<sup>16</sup> of 71,800 observations<sup>17</sup>.

Table 1 summarizes the main characteristics of our data set and shows the basic descriptive statistics of variables used in the estimates.

The dependent variable

The main dependent variable (D) is the per capita revenue from borrowing (bank loans and bond issues)<sup>18</sup>. We perform robustness checks using net borrowing revenues (ND=D–debt repayment) as dependent variable, as suggested by Pascual et al. (2004).

The main model that we estimate to test our hypotheses is the following (3):

$$D_{it} = \alpha_0 + \alpha_1 M\_INV_i + \alpha_2 DIF\_INV_{it} + \alpha_3 DIST_{it} + \alpha_4 ELEC_{it} + \alpha_5 DBE_{it} + \alpha_6 NCS_{it} + \alpha_7 KR_{it} + \alpha_8 DR_{it} + \alpha_9 CE_{it} + \alpha_{10} Y + \alpha_{11} SSR_{it} + \alpha_{12} INT_t + \alpha_{13} OLD_{it} + \alpha_{14} YOUNG_{it} + DUMMIES_{it} + u_{it}$$

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15 To deflate the data we have used the GDP deflator. However, the estimates presented in the paper are not affected by the deflator choice.

16 The unbalanced nature of our panel is not problematic as there is no evidence about a systematic pattern in the lack of some information in the CCC.

17 Tables 3 and 4 show a number of observations equal to 51,301 because of the estimate method we used that determine the loss of the first two years of observations.

18 “Cash advances” are excluded from the municipalities’ borrowing because they are not proper debt. In fact, municipalities make use of cash advances to cope with temporary mismatches between revenues and expenditures. Treasurers are obliged to provide cash advances, which must be repaid within the end of the financial year, up to a limit of 25 per cent of the current revenues resulting from the budget of two years before.

Table. 1: Summary of variables and descriptive statistics

Variable	Description	Source	Mean	Standard deviation	Min	Max
D	borrowing revenues (bank loans and bond issues), net of "cash advances" (accrual, per capita)	Ministry of Interior - Certificati di Conto consuntivo	109	165	0	1,270
ND	net borrowing revenues (D-DR; per capita)	Ministry of Interior - Certificati di Conto consuntivo	57	164	-347	1,236
INV	capital expenditure (accrual, per capita)	Ministry of Interior - Certificati di Conto consuntivo	542	625	27	5,585
M_INV	INV mean for the municipality (accrual, per capita)	Ministry of Interior - Certificati di Conto consuntivo	542	422	29	5,504
DIF_INV	INV-M_INV (accrual, per capita)	Ministry of Interior - Certificati di Conto consuntivo	0	461	-2,894	4,411
DIST	distance from the legal cap (25% up to 2004, 12% up to 2006 and 15% from 2007) of the ratio between interest expenditure in year t and current revenues in year t-2	Ministry of Interior - Certificati di Conto consuntivo	0.14	0,06	0,01	0,24
ELEC	dummy variable for elections year	Ministry of Interior - Registry of local and regional administrators	0,23	0,42	0	1
DBE	number of days up to next elections	Ministry of Interior - Registry of local and regional administrators	858	522	0	1,989
NCS	net current savings: current revenues –current expenditure - repayment of loans (per capita)	Ministry of Interior - Certificati di Conto consuntivo	16	92	-4,791	2,978
KR	capital revenues (accrual, per capita)	Ministry of Interior - Certificati di Conto consuntivo	401	565	12	4,865
DR	debt repayments, net of "cash advances" repayment (accrual, per capita)	Ministry of Interior - Certificati di Conto consuntivo	52	38	5	347
CE	current expenditure (accrual, per capita)	Ministry of Interior - Certificati di Conto consuntivo	780	322	414	1,919
Y	Average personal income (per capita)	Ministry of Economy and Finance	9,508	3,165	3,642	40,572
POP	resident population	National Institute of Statistics (ISTAT)	7,344	37,984	35	2,718,768
SSR	dummy var. for municipalities in Special Statute Regions	National Institute of Statistics (ISTAT)	0,15	0,35	0	1
INT	real interest rate (IRS 10y)	Datastream	2,80	0,82	1,87	4,66
OLD	share of pop. older than 65	National Institute of Statistics (ISTAT)	0,21	0,06	0,04	0,67
YOUNG	share of pop. aged between 18 and 30	National Institute of Statistics (ISTAT)	0,32	0,06	0,05	0,55
D_CLASS	demographic class of the municipality (1=0-5,000;2=5,001-9,999;3=10,000-19,999;4=20,000-59,999;5=more than 60.000)	National Institute of Statistics (ISTAT)	1,52	0,93	1	5

### The explicative variables

The main explicative variables. – To test the hypothesis the Italian municipalities borrow to assure a certain degree of intergenerational equity (and not to benefit from fiscal illusion) we use capital expenditure (INV) and current expenditure (CE). We expect a positive coefficient for capital expenditure, while for current expenditure the coefficient should be negligible and not statistically significant.

To test the second hypothesis (tax and spending smoothing), capital expenditure has been decomposed into two components. The first component is the average value of INV for each municipality for the years 1998-2007 (M\_INV) and can be interpreted as the long term value of capital expenditure. The second component (DIF\_INV), equal to the difference between INV and M\_INV, measures the gap between the effective and the long term level of capital expenditure and tries to capture the “extraordinary” component of capital expenditure the municipality has to face. We expect a positive sign for both variables because municipalities should use the debt to spread capital expenditure over a long period of time. Furthermore, the coefficient of DIF\_INV should be significantly higher than that of M\_INV. In fact, if municipalities don't want (or can't afford) abrupt changes in tax rates or spending, the financing of an “extraordinary” capital expenditure should rely more on debt than the case of an “ordinary” capital expenditure.

To test the effectiveness of quantitative borrowing limits an indicator (DIST) has been built to measure the distance between the ceiling imposed by the law and the effective value of the ratio between interest expenditure at time  $t$  and current revenues a time  $t-2$ . The legal ceiling has changed several times during the period covered by this paper: it has been equal to 25 percent until 2004, then reduced to 12 percent and finally increased to 15 percent in 2007. A positive and statistically significant coefficient of DIST would suggest that borrowing limits are effective, meaning that the more indebted a municipality is (low DIST), the less willing it is to borrow other money, *ceteris paribus*.

Finally, as concerns the political budget cycle hypothesis, we create two variables: the first variable (DBE), following Gennari and Messina (2009), measures (in days) the time remaining until the next elections; the second (ELEC) is a dummy variable that takes the value one in the elections year and zero otherwise. A negative (positive) and statistically significant coefficient of DBE (ELEC) would bring evidence about the existence of a political budget cycle in the expenditure behaviour of Italian municipalities.

The other controls. – In the economic literature about borrowing choices of sub-national governments (Vallés and Zárate, 2006; Cabasés et al., 2007; Wang et al., 2007 ) the main control variables included in the regressions are capital revenues (KR) and net current savings (NCS)<sup>19</sup>, that represent the main financing sources for capital expenditure other than borrowing. The expected sign for both variables is negative because, keeping constant capital expenditure, higher capital revenues/net current savings lead to a lesser need for debt.

The other important control in our estimates is the average personal income (Y), whose expected sign is ambiguous (Letelier, 2010). On the one hand, if investment expenditure is a normal good then the increase in Y should be associated with a higher investment expenditure and thus with an higher debt (fiscal necessity)<sup>20</sup>. On the other hand, the municipality's revenues are positive correlated with Y, thus an increase of Y will lower the need for borrowing to finance investments (fiscal capacity). Which one of the two factors would prevail is an empirical matter.

To check if debt rollover (i.e. paying back existing debt by issuing new debt) does matter we have controlled for the reimbursement expenditure (DR). As debt rollover is banned in Italian legislation, we expect DR be not statistically significant.

We take into account institutional differences about regions which municipalities belong to with a dummy variable (SSR) that takes value equal to one for municipalities belonging to a Special Statute Region and zero otherwise<sup>21</sup>.

To control for the cost of the debt we should have information on the interest rate applied to each single municipality which we do not have. However, it is reasonable to expect that the dispersion of the interest rates applied to each single municipality not to be high for at least two main reasons. First, the CDP, which owns a large share of the loans market to local governments, applies uniform conditions to all municipalities. Second, on loans from other lenders than the CDP, the wide spread use of the DP should reduce the impact of the creditworthiness of the single municipality on the interest rate. For these reasons we control for the cost of debt using the market interest rate level (INT)<sup>22</sup> and we expect a negative coefficient.

Finally, we try to control for the voters' preferences (Wang et al., 2004; Pettersson-Lidbom, 2001) through the variables OLD, the percentage of people aged 65 or more, and YOUNG, the percentage of people aged between 18 and 30. The expected sign of OLD is positive, since older people should be more favourable to borrow in order to dump on future generations (part of) the investments cost. On the other side, the expected sign for YOUNG is negative as young generations should prefer more taxation to finance investment because, not having an income (or having a lower income than the average), they are not hit by taxes.

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20 In addition, municipalities with a higher tax base should have a better and easier access to financial markets.

21 For a detailed description of financing framework of municipalities belonging to Special Statute Regions see Fabbrini et al. (2008).

22 More specifically, we use the IRS 10y deflated using the GDP deflator.

In the reported estimates we also control for the region/province which the municipality belongs to, for the year and population class sizes. The expected signs for our main variables are summarized in table 2.

Table 2: Expected coefficients' signs of main regressors.

Variable	Coefficient	expected sign	Variable	Coefficient	expected sign
M_INV	$\alpha_1$	+	DR	$\alpha_8$	?
DIF_INV	$\alpha_2$ ( $\alpha_2 > \alpha_1$ )	+	CE	$\alpha_9$	?
DIST	$\alpha_3$	+	Y	$\alpha_{10}$	?
ELEC	$\alpha_4$	+	SSR	$\alpha_{11}$	?
DBE	$\alpha_5$	-	INT	$\alpha_{12}$	-
NCS	$\alpha_6$	-	OLD	$\alpha_{13}$	+
KR	$\alpha_7$	-	YOUNG	$\alpha_{14}$	-

## 6. The econometric strategy and the estimates

### The econometric strategy

When we estimate eq. (3) we face evident problems of endogeneity due to the simultaneity of municipalities' choice about how much to invest and how to finance investments (taxes and debt). While KR (capital revenues) can be taken as exogenous since it cannot be influenced by municipalities<sup>23</sup>, INV (capital expenditure) and NCS (net current savings) are clearly endogenous. On the one hand, the decisions about how much to invest/save affect borrowing; on the other hand, the borrowing decisions impact on investments and savings<sup>24</sup>.

To cope with the simultaneity of D, INV and NCS, we have estimated eq. (3) using instrumental variables. As concerns INV, given the decomposition into M\_INV and DIF\_INV, where M\_INV is time-invariant for each municipality, we have instrumented only DIF\_INV. As instrumental variables we have used two lags for both DIF\_INV and NCS. The results of the first stage regression suggest that our instruments are relevant; using lagged variables we should also bypass the problem of endogeneity.

<sup>23</sup> This is true at least for transfers from higher levels of government, that are the main source of KR.

<sup>24</sup> Hausman test clearly rejects the exogeneity of INV and NCS.

The results of estimates

In table 3 we report our estimates using IV-2SLS random effects; random effects model allows to exploit the variability both the time and the cross-section dimensions of our data<sup>25</sup>. The risk to have inconsistent estimates due to the potential correlation between the unobserved heterogeneity and the error term is minimized by the high number of controls we have included.

Table 3: Random effects estimates. Dependent variable: D (per capita borrowing revenues).

Variable	(1)	(2)	(3)	(4)	(5)
M_INV	0.856 *** (0.045)	0.850 *** (0.046)	0.856 *** (0.044)	0.858 *** (0.044)	0.855 *** (0.044)
DIF_INV	0.911 *** (0.050)	0.904 *** (0.051)	0.911 *** (0.049)	0.914 *** (0.050)	0.912 *** (0.050)
DIST	-22.291 (22.334)	-23.489 (22.215)	-22.161 (22.308)	-25.004 (22.395)	-22.345 (22.315)
ELEC		9.091 * ( 4.835)	18.492 *** (3.512)	18.951 *** (6.927)	19.016 *** (6.936)
DBE	0.0009 (0.001)		0.008 *** (0.003)	0.008 ** (0.003)	0.008 ** (0.003)
NCS	-0.971 *** (0.053)	-0.963 *** (0.054)	-0.970 *** (0.052)	-0.978 *** (0.053)	-0.976 *** (0.053)
KR	-0.882 *** (0.049)	-0.874 *** (0.051)	-0.881 *** (0.048)	-0.884 *** (0.049)	-0.883 *** (0.049)
DR	0.043 (0.034)	0.043 (0.034)	0.043 (0.034)	0.030 (0.034)	0.036 (0.034)
CE	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)
Y	-0.002 *** (0.0005)	-0.002 *** (0.0005)	-0.002 *** (0.0005)	-0.002 *** (0.0005)	-0.002 *** (0.0005)
POP					0.00002 (0.000)
SSR	10.283 * (5.756)	9.572 * (5.699)	10.105 * (5.698)	6.507 (15.297)	8.951 (15.244)
INT	-3.458 * (2.014)	-3.170 (2.045)	-3.829 * (2.107)	-3.720 * (2.096)	-3.736 * (2.095)
OLD	38.035 (33.803)	37.386 (33.582)	38.132 (33.794)	63.682 * (35.795)	58.505 (35.644)
YOUNG	-65.452 (42.839)	-65.417 (42.500)	-65.180 (42.842)	-52.423 (46.497)	-49.426 (46.427)
Constant	62.028 *** (22.192)	60.094 *** (21.922)	57.909 *** (21.815)	43.800 * (23.383)	40.945 * (23.281)
Regional dummies	YES	YES	YES	NO	NO
Year dummies	YES	YES	YES	YES	YES
Demographic size dummies (D_Class)	YES	YES	YES	YES	NO
Provincial dummies	NO	NO	NO	YES	YES
N	51,301	51,031	51,301	51,301	51,301
R-squared					
	<i>within</i>	0.5805	0.5803	0.5801	0.5798
	<i>between</i>	0.5362	0.5372	0.5363	0.5387
	<i>overall</i>	0.5785	0.5787	0.5782	0.5791

IV- G2SLS estimates. Standard errors in parentheses. \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% levels, respectively.

The main explicative variables. – Our estimates confirm that municipalities borrow mainly to finance investment expenditure: in all specification of the model the coefficient of M\_INV is positive (between

0.85 and 0.86) and statistically significant, while the coefficient of CE (current expenditure) is negative and not statistically significant<sup>26</sup>. This result is not surprising since in Italy, even before the golden rule was written in the constitution, borrowing for municipalities was usually allowed only to finance investment expenditure.

Furthermore, the coefficient of DIF\_INV is statistically greater than that of M\_INV, although the difference is not so large. When municipalities face a level of capital expenditure higher than the ordinary one (measured as the long term average), they increase the share of investments financed with debt rather than tightening up the tax burden (or reducing current expenditure).

DIST is not statistically significant in any of our specifications. The quantitative limits seem not to be effective in restraining borrowing<sup>27</sup>. It might be due to the fact that the decrease in interest rates since Italy has joined the EMU has relaxed the legal constraint and it would explain why the Parliament has reduced several times the borrowing limits (from 25 to 15 per cent) in the time span covered in this paper<sup>28</sup>.

As regards the political budget cycle variables, DBE (number of days remaining to the next elections) is not statistically significant (column 1 in table 3), while the dummy variable for the elections year (ELEC) is statistically significant only at 10 percent level (column 2 in table 3). However, in the specification in which DBE and ELEC appear together (column 3 in table 3) both the variables are significant at 1 percent level with a positive coefficient. This is very interesting because, according to this specification, the behaviour of Italian municipalities borrowing would follow a particular “√” shape during the 5-year term: at the beginning of the term borrowing increases, then it starts decreasing until the year of the elections when it jumps up again<sup>29</sup>. A possible explanation for this “√” shaped behaviour is that the mayors tend to invest more at the beginning of their term in order to complete the investment before the

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26 Vallés and Zárata (2006) and Cabasés et al. (2007) find a positive a significant effect of investment expenditure on borrowing for Spanish municipalities, although the magnitude of this effect is smaller (the estimates range from 0.17 to 0.37) than in our case.

27 The international empirical evidence about quantitative limits on sub-national governments' borrowing is not conclusive and a crucial role is played by the way they are designed and implemented. For the USA Abrams and Dougan (1986) find evidence of the effectiveness of quantitative limits, while opposite results are drawn by Kenyon (1991) and Alt and Lowry (1994). For European countries, Derycke and Gilbert (1985) find evidence of the effectiveness for France and Cabasés et al. (2007) for Spain; for the latter Vallés e Zárata (2006) find no evidence of effectiveness.

28 Another reduction of the legal limit (from 15 to 8 percent) has been established by the financial law for the year 2011.

29 Other works find evidence of a political cycle in the sub-national government indebtedness (see, for instance, Ashworth et al., 2005, with respect to Flemish municipalities or Letelier, 2010, for Chilean municipalities). However, Pascual et al. (2004) don't find any political budget cycle effect for Spanish municipalities.

new elections come and to benefit from the resulting political consensus<sup>30</sup>; in the elections year the borrowing increase is aimed at reducing the fiscal burden or boosting current spending.

The other controls. – NCS (net current savings) and KR (capital revenues) show the expected (negative) signs: *ceteris paribus*, higher savings or capital transfer lead to a lower borrowing.

Although DR (debt repayments) has a positive sign, it is not statistically significant: once controlled for the effect of DR on NCS, we do not find evidence of debt rollover<sup>31</sup>.

In all model specifications the coefficient of Y (per capita average personal income) is negative and statistically significant (though small in absolute value). Thus for Italian municipalities the “fiscal capacity” effect seems to prevail on the “fiscal necessity” effect; municipalities which can rely on a higher per capita tax base borrow (slightly) less than poorer municipalities.

The coefficient of the dummy for those municipalities belonging to a Special statute region (SSR) has a positive sign, but it loses significance once we have controlled for the provincial dummy (columns 4 and 5 in table 3); it suggests that municipalities belonging to SSR do not seem to behave differently with respect to other municipalities.

INT (IRS 10y) has the sign (negative) we expected, although it is statically significant only at 10 percent level (in specification 2 it is not significant). Higher interest rates determine a lower borrowing, even if the effect is small, probably because of the municipal budget rigidity.

The variables OLD (share of people aged 65 or more) and YOUNG (share of people aged between 18 and 24) have the expected (positive for the former, negative for the latter), but they are not significant<sup>32</sup>.

Finally, we do not find any statistically significant difference between municipalities belonging to different demographic classes (D\_CLASS). In specification (5) we have controlled for the variable POP (municipality’s population) in order to check if the absence of effect depends on how we have defined the classes, but neither POP is statistically significant.

In table 4 we report the estimates using ND (per capita net borrowing revenues) as dependent variable. In general, the results confirm those in table 3, with two exceptions: 1) DIST changes sign (from

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30 Another reason is to avoid losing votes because of the inconveniences due to the construction of public works.

31 DR is no longer significant as soon as we introduce regional/provincial dummies in the model specification.

32 OLD is significant only in the specifications of the model (not reported in the paper) where we do not include regional/provincial dummies.



negative to positive), but it is still not significant; 2) CE is statistically significant with negative sign (an increase in current expenditure, ceteris paribus, would lead to a reduction in borrowing)<sup>33</sup>.

Table 4: Random effects estimates. Dependent variable: ND (per capita net borrowing revenues).

Variabile	(1)	(2)	(3)	(4)
M_INV	1.248 *** (0.190)	1.294 *** (0.250)	1.033 *** (0.092)	0.962 *** (0.091)
DIF_INV	1.274 *** (0.166)	1.322 *** (0.186)	1.119 *** (0.103)	1.072 *** (0.106)
DIST	0.197 (0.916)	0.198 (0.958)	0.105 (0.680)	0.085 (0.656)
ELEC		11.090 (5.608) **	20.336 *** (6.556)	20.137 *** (7.078)
DBE	0.002 (0.002)		0.009 *** (0.003)	0.009 *** (0.004)
NCS	-2.360 *** (0.410)	-2.466 *** (0.456)	-1.161 *** (0.107)	-0.966 *** (0.085)
KR	-1.254 *** (0.167)	-1.302 *** (0.186)	-1.087 *** (0.101)	-1.024 *** (0.101)
CE	-0.125 *** (0.022)	-0.13 *** (0.023)	-0.045 *** (0.006)	-0.033 *** (0.005)
Y	-0.008 *** (0.002)	-0.008 *** (0.002)	-0.002 *** (0.0008)	-0.002 ** (0.0006)
SSR	45.291 (213.920)	48.640 (371.267)	45.178 *** (9.742)	41.199 *** (14.104)
INT	-16.228 *** (4.897)	-16.948 *** (5.323)	-11.669 *** (3.439)	-10.042 *** (3.611)
OLD	7.575 (122.147)	20.988 (128.981)	-2.813 (46.368)	17.984 (34.119)
YOUNG	-113.651 (132.373)	-128.858 (139.908)	-60.084 (58.815)	-39.628 (43.643)
Constant	220.609 (137.849)	231.083 (215.627)	65.498 * (31.470)	42.224 * (24.263)
Regional dummies	YES	YES	YES	NO
Year dummies	YES	YES	YES	YES
Demographic size dummies (D_Class)	YES	YES	YES	YES
Provincial dummies	NO	NO	NO	YES
N	51,301	51,301	51,301	51,301
R-squared				
	<i>within</i> 0.4727	0.4698	0.5551	0.5645
	<i>between</i> 0.3867	0.3825	0.5002	0.5099
	<i>overall</i> 0.4500	0.4466	0.5424	0.5522

IV- G2SLS estimates. Standard errors in parentheses. \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% levels, respectively.

## 7. Conclusions

In this paper, trying to fill in a gap in the literature, we analyze the main determinants of Italian municipalities borrowing decisions. Using a panel data set for the years 1998-2007, our results can be summarized as follows: i) municipalities, coherently with the Italian legal framework, borrow mainly to

finance investment expenditure; ii) we find evidence that municipalities use debt for tax smoothing when they face deviations of capital expenditure from its long term average; iii) in the elections year municipalities increase the share of investments financed with debt; iv) quantitative borrowing limits (a cap on interest expenditure of 15 percent of current revenues) do not seem effective.

The first two results suggest that Italian municipalities use debt in a safe and sustainable way, in order to finance investments and avoid taking decisions that can negatively affect the economy. However, the latter two results deserve greater attention, especially in the light of the ongoing implementation of fiscal federalism in Italy.

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