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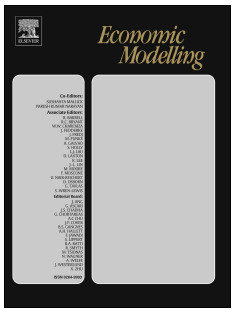

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Fiscal Consolidation by Intergovernmental Transfers Cuts? The Unpleasant Effect on Expenditure Arrears

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Abstract

On a large dataset of Italian municipalities for the period 2003-2014, we investigate unexplored effects of fiscal consolidation in decentralized public finance. Based on a simple, realistic theoretical model, we show that municipalities increase arrears on committed public investment expenditure as a response to intergovernmental transfer cuts. Then, we test our predictions controlling for potential sources of endogeneity, and find that a reduction in central government transfers causes a significant increase in arrears, besides other usual adjustments to local fiscal policy (e.g., tax revenues). Our results highlight a perverse effect of fiscal consolidation packages implemented by centrally imposed fiscal restraints.

Keywords: Expenditure commitments; Fiscal federalism; Fiscal rules; Instrumental variables.
JEL classification: H30; H72; H77; C33; C36.

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1 Introduction

Multi-tier public finance features governmental institutions of almost all countries across the world. Within such a framework, central governments aiming at fiscal consolidation tend to mandate part of the necessary fiscal adjustments to local governments (OECD (2013); European Commission (2014)), and they often do it by implementing cuts in intergovernmental transfers and introducing new local fiscal rules.[1] As stressed by the OECD Report on Fiscal Federalism (OECD, 2013), the reduction of intergovernmental grants is likely to be a powerful lever to address fiscal consolidation, given that they account for around 4% of GDP, 8% of total government spending, and around 50% of the total local government revenues in OECD countries.

The systematic assessment of the effectiveness of these instruments in the framework of fiscal consolidation packages is lacking, and this is partly due to the insufficient quality of data which does not allow for the identification of the causal link between the adoption of measures at central level and fiscal policy outcomes at local level. Only a few papers have empirically investigated the effects intergovernmental transfer cuts in a fiscal consolidation perspective. This is surprising in view of the widespread adoption of such measures in different countries and times, their importance for local public expenditures and, of course, their immediate impact on the welfare of many citizens relying on local public services and infrastructures. Using a panel data of OECD countries during 1980-2005, De Mello (2007) finds that higher transfers had a negative impact on subnational governments budget discipline. One possible explanation of the positive relationship between transfer reductions and fiscal consolidation is the "flypaper effect", i.e. the observation that local governments' propensity to spend is higher if their expenditures are financed through intergovernmental grants rather than their own revenues. Under the flypaper assumption, lower transfers would improve budget balance at the central level more than they would deteriorate it at the sub-central level, hence the net effect would be positive (Hines and Thaler, 1995; Inman, 2008). More recent empirical papers highlight that the more expenditures are in the hands of subnational levels of government, the more fiscal consolidation burdens tend to be shifted to subnational levels (Vammalle and Hulbert, 2013), and that a reduction of intergovernmental transfers increases the probability of success for fiscal consolidation (Blöchlinger, 2013).

In this paper we empirically identify an unexplored and perverse effect determined by the implementation of intergovernmental transfer cuts, in presence of binding constraints on the local governments' (formal) borrowing capacities. Specifically, we test the hypothesis that *a reduction of intergovernmental transfers causes an increase in arrears on municipal public investment expenditure*. The intuitive transmission channel is that municipal governments react to cuts in central gov-

[1] Unfunded mandates of public expenditure and delegated changes of local taxes are other instruments that are commonly adopted by central policy makers aiming at fiscal consolidation. For a discussion of these instruments and related issues see Hagemann (2012).

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ernment transfers by postponing the payments of *committed* expenditure for investments – e.g., works for local public services – to future years. In so doing, local governments relax short-run financial restraints by increasing the stock of arrears on payments for executed (or under execution) investments. As highlighted by the public finance literature, (Diamond and Schiller, 1993, and Checherita-Westphal et al., 2016, among others) arrears are undesirable for at least three reasons: (i) they lead to a 'camouflaging' of local governments' debt position; (ii) they may dampen the effectiveness of local fiscal consolidation; and, (iii) they directly affect the supplier firms' financial conditions, particularly in the case of small and medium enterprises facing bad credit ratings, and in this way may undermine macroeconomic and financial stability. Using an extended and unique dataset, we add novel empirical results on effects (i) and (ii).

Specifically, our analysis focuses on Italian municipalities during the period 2003-2014, that represents an ideal field in which to empirically assess the contribution of intergovernmental transfer cuts to fiscal consolidation efforts for at least four reasons. First, according to the IMF definition (Devries et al., 2011), this is a period of fiscal consolidation, which has been characterized by the significant reduction in transfers to municipalities and the hardening of fiscal rules on local public finance. Second, as it is common to all countries featuring multi-tier public finance, the Italian municipal finance depends heavily on intergovernmental transfers (i.e., current transfers are on average about one third of the total current revenues). In turn, the scope for spending and revenue adjustments to cope with a cut in transfers is limited: on the one hand, municipalities have little control over their revenues (because of limited autonomy over tax bases or rates), while, on the other hand, much of the expenditure is delegated by higher levels of government through fiscal federalism mechanisms. Third, since the sweeping reform of local public finance introduced in 1978, Italian municipalities have been subject to a set of fiscal rules put in place by the central government in order to control local government debt. Moreover, the Domestic Stability Pact (or DSP) – a complex set of rules on deficit and/or expenditure that was introduced in 1999 as a consequence of the European Union Stability and Growth Pact – has been a binding constraint on borrowing capacity through different formal channels (see, among others, Chiades and Mengotto, 2015). These rules did not significantly change during the period of our analysis, thus limiting the problems associated with confounding events in the identification of the effects of changes in transfers. Fourth, liabilities stemming from arrears – as other forms of delays in payments related to supplies of goods, services and public works – were not included in the formal definition of the debt. Consequently, Italian municipalities could use arrears without constraints, as they were not subject to control by supervision authorities.

We run our analysis on a large dataset which collects the accounting and financial reports of the 6,700 Italian municipalities belonging to the 15 Italian ordinary regions, for the period 2003-2014. From these reports we can observe, for each year and each municipality, the different types of intergovernmental transfers that are re-

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ceived; the amount of expenditure commitments for public investments that are not paid and, for any reason, are postponed to the future – that is a proxy of the arrears on municipal public investment expenditure[2]; and further budgetary information that, together with the municipalities' structural and geographical characteristics, help us to control for other determinants of arrears.

A preliminary analysis shows that intergovernmental transfers are negatively correlated with arrears, besides usual intuitive correlations with other municipal fiscal policy outcomes (e.g., tax revenues). In order to carefully identitfy which transmission channels could explain the observed behavior and coherently draw empirically testable predictions, we build a simplified model of fiscal policy *à la* Samuelson-Diamond (Barro, 1974), based on the stylized features of the Italian local public finance. We assume that municipal governments maximize an inter-temporal objective function that, in each period, is increasing in current and investment public expenditure and decreasing in tax burden under a budget constraints whereby tax revenues, intergovernmental transfers, and public debt variations finance municipal public expenditures. Considering the Italian institutional framework, we assume that fiscal rules limit the maximum amount of debt that can be issued by each municipality; total municipal revenues, net of current expenditure and public debt service, finance (cash) expenditure for public investments that will produce social benefits partly in future periods and partly in the current period. The model predicts that fiscal rules are binding (i.e., the municipal debt reaches the maximum allowed level) and that an exogenous reduction of intergovernmental transfers determines besides the usual impacts – e.g., tax revenues increases – an increase of arrears on public investment expenditure. The latter effect can represent both a kind of trade debt – that is, firms contracting with municipalities are not paid for public works they completed – and/or an outright decision to postpone public contracts to future periods.

Our empirical findings suggest that, as predicted by our model, the relationship between changes in intergovernmental transfers and arrears is robust to several checks and it is not trivial. Everything else equal (in particular, the level of formal debt), a 10% decrease in central government transfers is associated with at least a 1.7% increase in arrears for municipal public investment expenditure. This effect is statistically significant, and it is robust to alternative treatments that help us to exclude endogeneity problems. Specifically, to deal with endogeneity concerns, we

[2]According to international standards of public accounting and financial rules, government expenditures are measured on a commitment (or accrual) basis – that is, taking into account the year when the expenditure is formally decided and financed by the municipal government – and on a cash basis – that is, considering the year when the expenditure is actually cashed out. As highlighted by Checherita-Westphal et al. (2016), it is difficult to have clean measures of arrears on municipal public expenditure for investments in European countries, and proxy variables need to be used: "While it may not be possible to cleanly identify arrears in a legal sense, from an economic point of view, it may be more important to identify payment delays that go beyond what is expected by suppliers" (p. 150).

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follow a twofold empirical strategy. On the one hand, we aim at reducing omitted variable problems by focusing on a single country. Italy has a large number of municipalities of different sizes, located in different socio-economic environments. This allows us to analyze constituencies governed by a common regulatory framework and responding to similar macro shocks, without losing the cross-sectional and over-time variability of the variables of interest. On the other hand, we adopt a novel instrumental variable approach, which consists of the exploitation of the historical break introduced in the Italian local public finance by the sweeping reform of 1978, to obtain an exogenous determinant of the intergovernmental transfers. The narrative analysis of Italian municipal public finance and our empirical evidence show that the criteria for the allocation of transfers from central to local governments adopted in 1979 have shaped central government transfers to municipalities since their introduction and over the entire period under investigation.

Our empirical results lead to consider arrears as a form of non-conventional, short-term public debt. In this direction, our paper also contributes to the empirical literature on the relationship between changes in intergovernmental transfers and local public debt that has not achieved consensus on the direction of causality (see, for example, De Mello, 2007).[3]

The rest of the paper is organized as follows. In Section 2, we present our database and the institutional setting of Italian municipalities; then, we introduce a simple model to work out testable predictions, that make it possible to identify transmission channels, and our baseline empirical model. In Section 3, we present the main empirical results while, in Section 4, we discuss relevant robustness checks and further results on alternative outcome variables. Section 5 offers concluding remarks.

2 Data and analytical framework

In this Section, we first present the institutional setting, the panel dataset consisting of information from the accounting and financial reports of Italian municipalities, and the available measures that capture the financial constraints and the expenditure arrears (Section 2.1). Then, building on the described institutional setting, we present a simplified model of municipal public finance from which we draw testable

[3]Using a panel of OECD countries for the period 1980-2005, De Mello (2007) finds a stable long-term relationship between current transfer receipts and local government net worth but underlines that the direction of causality is sensitive to estimation techniques. In fact, other studies have highlighted a possible reverse causality: whenever cuts in central government transfers are not credible, expectations of future bailouts may induce local governments' fiscal profligacy in the form of greater borrowing to finance public expenditure (Goodspeed, 2002). The credibility of the institutional framework of federal systems and, in particular, of intergovernmental fiscal relations plays a central role in determining which one of these two alternative theories is relevant (Wildasin, 2004).

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predictions (Section 2.2) and, finally, we introduce our baseline reduced-form empirical model (Section 2.3).

2.1 Municipalities' accounting and financial framework

In Italy, municipalities are the smallest administrative units and they provide a wide range of public goods and services (i.e., local transport, local police, culture and recreation, land management and environment, schools and complementary education services, and registry services, etc.). They manage about half of total government investment expenditures. For instance, municipalities outsource to private suppliers of about 50% of public works in Italy (i.e., road works and public building constructions).[4] These expenditures are recorded by each municipality in its accounting and financial report ("Certificato di Conto Consuntivo") which should be transmitted to the Italian Ministry of the Interior each year. This source of information provides us with a clear picture of each municipality's annual financial situation, for both the revenue and the expenditure sides of the budget.

In the analysis, we focus on the 6,700 municipalities belonging to the 15 Italian ordinary regions in the period 2003-2014.[5]. We do not consider the 1,400 or so municipalities of the remaining 5 Italian special regions since the latter enjoy a larger degree of legislative and financial autonomy and respond to different regulations in many fields, that is likely to determine radically different incentives for municipal governments.[6]

We study the financial restraints on the municipalities by focusing on one of the main sources of revenue: the current transfers from the central and regional governments and other public administrations to a municipality (i.e., intergovernmental transfers). Over the last three decades, intergovernmental transfers have shaped the financial conditions of Italian municipalities, and in the period 2003-2014, on average, they accounted for about one third of the municipalities' total current revenues. Together with the constraints put on local public debt, which we control for in our analysis,[7] intergovernmental transfers are a key variable in the fiscal consolidation

[4]For detailed information referring to the years covered by our analysis, see the Annual Reports ("Relazione annuale") of the Italian Authority for the Supervision of Public Contracts (AVCP).

[5]We started our analysis in 2003 for two reasons: first, to avoid the confounding effect of the change to the fiscal rules (DSP) that occurred in 2001 for municipalities with fewer than 5,000 inhabitants (Grembi et al.) and, second, to conduct the analysis during a fiscal consolidation period (Devries et al., 2011). In the same vein, we stopped our analysis with 2014 because from 2015 substantial changes in the accounting of the arrears were introduced. This has caused a discontinuity in the time series of arrears in the municipalities' accounting and financial reports, which makes comparison with previous years particularly difficult.

[6]Note that in our analysis we cannot use about 7% of the municipality-year observations because some data are missing for some of the control variables.

[7]Two fiscal rules were imposed on Italian municipalities during the period of our analysis. The first is the DSP, a complex set of rules in terms of deficit and/or expenditure for municipalities with more than 5,000 inhabitants; this rule did not appreciably change during the period of analysis, and

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process. In turn, intergovernmental transfers drive the "marginal" adjustments required to fulfill the budget balance rule, which municipalities are forced by law to pursue each year, since the 1978 reform.

In the period of our analysis, average per capita intergovernmental current transfers were about 214 euros (in 1995 constant prices) and this value varied across municipalities. Table 1 shows large overall and between variations (211 and 156 euros, respectively) and a within municipality variation of 144 euros.

From the accounting and financial reports, for each municipality and each year, we obtain a measure of outstanding payments ("residui passivi") for municipal public investment expenditure, that is the amount of expenditure commitments for public investments that has not been cashed out by the end of the year and is, for any reason, postponed to the future. Our focus is on investment expenditures since we are interested in the effects of a transfer cut in the presence of (direct and indirect) constraints on public debt which, according to the legal rules featuring the Italian local public finance since the sweeping reform introduced in 1978, can only be issued to finance investment expenditures.[8] Descriptive statistics in Table 1 show that – on average, in per capita terms, and measured at constant prices – the outstanding payments for investment expenditures were about 334 euros (with a standard deviation of 821 euros). To give a better idea of the weight of the outstanding payments on the municipalities' budgets, the "new" outstanding payments that are formed each year were, on average, about 32% of their stock at the beginning of the year, and they represented about 87% of the committed investment expenditures of municipal governments.

Table 1 – Summary statistics (Real euros per capita). Period 2003-2014.

		SD		
VARIABLES	Mean	Overall	Between	Within
Arrears (Inv.)	333.545	820.791	477.827	670.939
Current transfers	214.243	211.427	156.401	144.106
Investment expenditure	384.822	870.489	528.771	694.883
Debt Interest expenditure	31.945	28.711	26.126	11.910
Av. Taxable income	14637.760	2247.675	2185.587	562.575
Population	7541.226	42505.350	42753.730	1277.975
1979 Transfers	201.348	103.825		

we include dummy variables for municipality population categories to control for the differences above and below the threshold of 5,000 inhabitants. Second, because of the combining effects of the DSP and a cap imposed on the expenditure for debt service, municipalities were subject to borrowing limits (see, Chiades and Mengotto, 2015); we control for the debt interest expenditure.

[8]On the contrary, outstanding payments for current expenditures are generally tied to a temporary shortage of liquidity. Moreover, to analyze the behavior of the latter outstanding payments we would need additional information, lacking in our budgetary sources, about the purchases of intermediate goods or services that generate them.

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The amount of expenditure commitments for public investments is the variable that explains much of the variability in the outstanding payments. In fact, according to the legal framework of Italian local public finance since 1978 (and until 2014), multi-year investments of municipal governments "automatically" generated outstanding payments for the part of public works (and, hence, payments) that have to be cashed out in future years on the basis of the initial investment timetable. The accounting of the total accrual expenditure and the total accrual revenue is recorded in the first year of the investment project for the total amount of the work. Once we control for the accrual investment spending, *the outstanding payments can be considered as arrears*, because they represent payment delays tied to trade debts or to rescheduling agreements.[9]

A simple correlation between the (log of per capita) transfers and the (log of per capita) arrears, conditional on the (log of per capita) investment expenditure, is statistically significant and negative (-0.03). However, this simple and descriptive evidence does not take into account other potential determinants of the arrears. To grasp the possible transmission channels that bring to such result, we develop a simple, realistic model of fiscal policy decisions of municipal governments.

2.2 A simple theory of arrears' formation

Based on a simple model of public finance that encompasses the stylized institutional features of the Italian local public finance in the period 2003-2014, we characterize conditions under which a municipality – maximizing the welfare of its constituency under budget constraint – reacts to exogenous cuts of central government transfers alternatively by a) increasing arrears on public investment expenditure; b) raising local tax revenues; c) reducing public expenditures.

We assume that each municipal government maximizes an intuitive, inter-temporal

[9] According to the IMF Government Finance Statistics Manual (2001) arrears only occur if a bill is not paid by the due date, regardless of whether this is based on a contractual agreement, commercial law or custom. Admittedly, ours is not a perfectly clean measure of arrears. However, the difficulty in measuring public expenditure arrears, in Italy as well as in other countries across the world, is a common and well-known problem. For instance, in 2013 the Italian government decided to pay a large amount of arrears owed by the public administration to the private sector, but "the total amount owed is disputed" (*The Financial Times*, April 8, 2013). See also D'Aurizio et al. (2015) for the Italian case. In a study focusing on European Union countries, Checherita-Westphal et al. (2016) needed to construct proxies for the amount of arrears, as these figures are not directly available, nor they can be easily elicited from national accounts: "Public accounts typically do not track true arrears, except following ad hoc audits to identify them (as sometimes required under IMF programs). Alternative sources from international datasets do not report fiscal arrears either [...] Instead, depending on the public accounting system in place, there could be data on spending commitments, payment orders and actual payments (check or transfer). Differences between these stages can provide indications of the development of payment lags" (p. 149-150).

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objective function[10]

$$u_t = v(e_t - \lambda(\tau_t)) + h(k_t) + \delta E_t(u_{t+1}) \tag{1}$$

where: $\delta < 1$ is the inter-temporal discount factor; $v(.)$ measures the benefits that the municipal government draws, at time t, from current expenditure e_t, net of the political and economic costs (measured by the increasing and convex function $\lambda(.)$) of municipal taxation τ_t; $h(.)$ measures the benefits deriving in each period from the stock of municipal public capital (e.g., infrastructure for social services) k_t. We assume that $v(.)$ and $h(.)$ are well-behaved (twice differentiable, increasing, concave), and have constant absolute risk aversion, $\alpha^v = -\frac{v''}{v'}$ and $\alpha^h = -\frac{h''}{h'}$, such that:

$$\alpha^v \leq \alpha^h. \tag{2}$$

A sufficient condition for (2) to be satisfied is, for example, that the government's objective function is quasi-linear in the benefits of current public expenditures net of the social cost of taxation (i.e., $v'' = 0$).

To keep the model as simple as possible, we assume that the stock of public capital,

$$k_t = i_{t-1} + p_t, \tag{3}$$

is fully depreciated each year – thus the government benefit from it only in one period – and depends on expenditure commitments for public investments decided by the municipal government in the previous period i_{t-1}, as modified by the actual dynamics of payments for public investments in period t:

$$p_t = \theta_{t-1} + a_{t-1} \cdot (1 + \rho) - a_t. \tag{4}$$

The equation (4) represents all factors that influence the timing and the volume of municipal capital expenditure that is actually cashed out during the period t. We divide such factors in two components: an exogenous random shock $\theta_{t-1} \sim F(\theta)$ (with $E(\theta_{t-1}) = 0$), that affects the actual investment during the execution of public works contracts in $t - 1$ (after capital expenditure i_{t-1} has been decided); and the endogenous dynamics of arrears on public investment expenditure, that is the combination of past arrears that are cashed out in t and new arrears that are formed in the same period.

The random component θ_{t-1} allows us to consider all non-deterministic discrep-

[10]Note that the considered government's objective function can represent either the objectives of a benevolent government that considers the benefits and the costs of the local fiscal policy from its citizens' point of view, or the objectives of a self-interested policy-maker that has to face at least some degree of electoral competition, which forces her to care about social costs and benefits of her rent-seeking behaviors.

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ancies between the investment decided at time $t-1$ and the stock of capital available at time t, and to model model a number of selection problems that can depend on the structural features of the municipality.[11]

The component of arrears' dynamics allows us to explicitly model the endogenous formation of arrears. The municipal government adjusts the original investment plan, as exogenously modified by the random shock, by postponing investment payments to the future, i.e., issuing new arrears $a_t \geq 0$. We assume that arrears involve transaction costs that we model by an the implicit rate of return ρ, that the municipal government has to recognize to its contractors in order to secure delays in payments or outright postponement of public works. In our setting, these transaction costs are equivalent to (voluntary) cost and time overruns in public works.[12]

The municipal government faces the following budget constraint:

$$\tau_t + g_t + b_t - b_{t-1} = e_t + rb_{t-1} + i_t + p_t \tag{5}$$

where g_t are transfers by national and regional governments, b_t is local (gross) public debt issued at time t, r is the interest rate on local public debt, and i_t are the municipal capital expenditure commitments at time t (that will produce social benefits in $t+1$). From the institutional features of the Italian local public finance, we borrow the assumption that the municipal government faces a fiscal rule imposing a ceiling to the total debt that can be issued each year: $b_t \leq \bar{b}_t$.[13]

To avoid the unrealistic case in which municipal governments issue debt only in the form of arrears, we assume that $\rho > r$ (i.e., issuing formal debt is less costly than relying on hidden debt).

Let us now consider the maximization problem of the municipal government. To simplify the analysis, we substitute e_t by (5) and k_t by (3) in the objective function, and we maximize with respect to τ_t, i_t, a_t, and b_t for all t, considering the non-negativity constraint on arrears, $a_t \geq 0$ (with $\mu_t \geq 0$, the corresponding Lagrangian multiplier), and the upper bound on gross local public debt, $b_t \leq \bar{b}_t$ (with $\nu_t \geq 0$

[11]Selection problems refer to cost overruns due to firms' behavior or pre-contractual features of contractors, as well as to the capacity of the municipal government to monitor contractors' behaviors. Selection problems are determined by different features of municipalities such as demography, human and social capital in the local area.

[12]In our analysis, ρ is given; we implicitly assume that the municipal government has all the bargaining power when determining the delay in payment and works a_t. A thorough analysis of the bargaining process is beyond the scope of this work.

[13]This ceiling is determined by the combination of all fiscal rules imposed on municipal public debt (e.g., the golden rule linking local public debt to investments, the absolute maximum level of debt service expenditure, the DSP provisions). We do not include any lower bound to gross public debt, considering that the municipal government may issue negative debt (i.e., buy assets). The latter case is particularly relevant when we consider the provisions of the DSP.

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the corresponding Lagrangian multiplier). By the first order conditions[14]

$$\tau_t: \quad v_t'(1-\lambda_t') = 0 \tag{6}$$
$$i_t: \quad -v_t' + \delta E(h_{t+1}') = 0 \tag{7}$$
$$a_t: \quad v_t' - h_t' - \delta(E(v_{t+1}') - E(h_{t+1}'))(1+\rho) + \mu_t = 0 \tag{8}$$
$$b_t: \quad v_t' - \delta E(v_{t+1}')(1+r) - \nu_t = 0, \tag{9}$$

we obtain the following

Lemma 1 *The optimal municipal fiscal policy is such that $b_t = \bar{b}_t$ for all t.*

Proof. Assume that $b_t < \bar{b}_t$ (hence, $\nu_t = 0$) for all t. Substituting (7) and (9) in (8), $h_t' = v_t'(1 + r\frac{1+\rho}{1+r}) + \mu_t$. Substituting the expectation of the latter formula, at time $t+1$, in (7) and contrasting the result with (9), we have a contradiction (by $\rho > r$): $v_t' = \delta E(h_{t+1}')(1 + r\frac{1+\rho}{1+r}) + \delta E(\mu_{t+1}) > \delta E(h_{t+1}')(1+r) = v_t'$. ■

By Lemma 1, the municipal public debt level becomes a parameter of the government optimization problem. The optimal fiscal policy of the municipal government is determined by the first order conditions (6), (7), and (8). Thus, we have[15]

Proposition 2 *The optimal municipal fiscal policy is such that centrally imposed fiscal consolidation – i.e., a reduction of intergovernmental transfers g_t or a cut of the limit on municipal public debt $\bar{b}_t$ – increase (or do not decrease) arrears a_t and tax revenues τ_t, and decreases (or do not increase) expenditure commitments for public investments i_t.*

Proof. By inspection of the second-order cross derivatives of the objective function with respect to optimization variables and parameters, we can see that, if the sufficient condition (2) is satisfied, the objective function of the municipal government is supermodular in $(-\tau_t, i_t, -a_t, \bar{b}_t, g_t)$. Hence, the proposition follows. ■

From the Proposition 2, we draw our main testable prediction that *a reduction of intergovernmental transfers causes the growth of arrears on municipal expenditure for public investments.*

2.3 Baseline empirical model

To analyze the relationship between central government transfers and arrears on municipal investment expenditure, we estimate the following empirical reduced-form model:

$$a_{mt} = \alpha + \beta g_{mt} + \gamma MT_{mt} + \epsilon_{mt}. \tag{10}$$

[14]It is worth noticing that v_t' and h_t' are the marginal utilities of current and capital expenditure, respectively, and λ_t' is the marginal cost of public funds.

[15]The argument of Proposition 2 relies on monotone comparative statics techniques (Milgrom and Shannon, 1994).

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All monetary variables are expressed in logs of the per-capita values at constant prices. The dependent variable a denotes the arrears in investment expenditure in year t for municipality m. The main explanatory variable of interest is g, which represents the current transfers received from the central and regional governments and other public administrations by the municipality in any year. MT is the set of controls from the accounting and financial report of each municipality for each year (i.e., expenditure commitments for public investments and debt interest expenditure). The error term ϵ captures all factors that influence the arrears but are not captured by the model specification; it consists of municipality-specific time-invariant effects, municipality-specific time-varying effects, and time-varying macro effects that influence all municipalities.

One might be worried that the reduced-form model presented in (10) suffers of endogeneity problems due to omitted variables, since relevant characteristics correlated with both arrears and current transfers might not be captured by the variables included in MT. Accordingly, we take different precautions to face this problem.

First, we deal with time-varying omitted variables. In particular, we introduce in all the model specifications the average taxable income for each municipality m in year t (to control for the socio-economic development of the municipality) and a set of year-fixed effects (T, to deal with time-varying country-level changes on macro/financial conditions and regulation). Both factors could have affected municipalities' public finance conditions and availability of resources, and thus the arrears, in any given year.

Then, we deal with municipality-specific time-invariant omitted variables following three alternative approaches. The first approach consists of augmenting the model specification (10) with a set of municipality-specific control variables (M) that aim to control for the constituency's structural characteristics (see Section 3.1). In particular, we control for the municipality being a touristic location (proxied by the number of per-capita bed places in tourist accommodation), population size,[16] the location being in a mountainous area, the population density, the extension of the existing road network in the municipality, the socio-economic situation proxied by the unemployment rate, the share of young and old population. Data for all these variables come from the Italian National Institute of Statistics (ISTAT) and are used in our estimation to represent several dimensions of structural demand for and composition of each municipality's public spending. Furthermore, we augmented the model specification with the number of per capita non-profit associations (data are from Nannicini et al. (2013)) with the aim of controlling for social capital in the municipality and its implication on the supervision of the use of public money. Finally, we include in equation (10) province-fixed effects to control for factors that influence municipalities operating in contexts with similar socio-institutional features (such as crime and the effectiveness of the judicial system) and levels of economic and

[16] We include dummy variables for populations below 1,000 inhabitants, between 1,000 and 5,000, between 5,000 and 15,000, between 15,000 and 200,000, and above 200,000.

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financial development.

In this framework, our second alternative to reducing municipality-level time-invariant omitted variables involves the inclusion of municipality-fixed effects in the model specification (10). This approach fully captures the cross-sectional variability and allows us to exploit the within-municipality variability (see Section 3.2).

Finally, our third alternative approach proposes the exploitation of a source of exogeneity shaping the current budgetary situation of Italian municipalities. Specifically, we employ the 1979 levels of current transfers from the central government to the municipalities as a new instrument for the level of total current transfers in the period 2003-2014. A historical analysis of Italian local public finance clearly shows that the 1977-1978 reforms of the allocation of central government transfers were an exogenous event that had an important role in the allocation criteria of intergovernmental grants until recently (see Section 3.3).

3 Estimation results

3.1 Pooled-OLS

To establish the presence of a relationship between intergovernmental transfers and arrears we initially estimate via a pooled-ordinary least squares regression (pooled-OLS) the equation (10) augmented with the controls at municipality and municipality-year level, and province-fixed and year-fixed effects. Estimation results are presented in Table 2, column 1.[17] Our primary interest is in the estimated coefficient of current transfers, which indicates whether a municipality's change in transfers is reflected in the formation of arrears for investment expenditure. The estimated coefficient for transfers is negative and statistically significant. Thus, lower intergovernmental transfers harden the municipality's financial constraints, which forces the municipal government to increase arrears on expenditure commitments for public investments.

Concerning the estimated coefficients of other control variables, it is hardly surprising that the coefficient of committed investment expenditure is positive and statistically significant (indicating an elasticity of about 1). As for the interest expenditure variable, the estimated coefficient is positive but not statistically significant. This variable is a proxy of the cost of the municipality's debt and its positive coefficient indicates that higher the per capita expenditure allocated to expenditure for the formal debt, higher the per capita amount of arrears issued by the municipality. Finally, the negative coefficient of the average taxable income suggests that richer municipalities tend to be correlated with smaller arrears.

[17] In all specifications, we report standard errors clustered at the municipality level, which are robust for serial correlation and heteroscedasticity. Due to space constraints, the coefficients for the time-invariant socio-economic controls at the municipality level are not reported; we only report coefficients related to time-varying public finance variables.

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3.2 Within estimator

To further prove the validity of the estimated relationship between current intergovernmental transfers and arrears, we employ a within-municipality estimator. This approach exploits the variation over-time and within each municipality of the intergovernmental transfers and controls for all time-invariant characteristics of the municipality.

In Table 2, column 2, we report the results obtained with the within estimator for the equation (10) augmented with the usual set of controls at the municipality-year level, and year-fixed effects. The estimated coefficient of the current intergovernmental transfers is again negative and statistically significant, with a magnitude similar to the coefficient estimated with OLS.

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Table 2 – Main estimation

Column	(1)	(2)	(3)	(4)	(5)	(6)
Estimator	OLS	Within		2SLS		
			First-stage	First-stage	Second-stage	Second-stage
Dependent variable: log of	Arrears	Arrears	Current transfers	Current transfers	Arrears	Arrears
Current transfers	-0.015**	-0.018***			-0.173***	-0.161***
	(0.006)	(0.007)			(0.056)	(0.052)
Investment expenditure	1.053***	1.066***	0.034***	0.033***	1.059***	1.058***
	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)
Interest expenditure	0.003	0.039***	0.048***	0.046***	0.012*	0.011*
	(0.006)	(0.009)	(0.006)	(0.006)	(0.007)	(0.007)
Av. Taxable income	-0.027	-0.075	-0.357***	-0.370***	-0.076*	-0.072*
	(0.035)	(0.082)	(0.038)	(0.038)	(0.039)	(0.040)
1979 transfers			0.198***	-1.502***		
			(0.013)	(0.186)		
1979 transfers (squared)				0.160***		
				(0.018)		
Municipality controls	YES	NO	YES	YES	YES	YES
Municipality FE	NO	YES	NO	NO	NO	NO
Province FE	YES	NO	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	74,460	74,460	74,460	74,460	74,460	74,460
R-squared	0.818	0.783	0.564	0.568	0.815	0.816
F-test of excluded instruments			224.45	126.22		
Hansen J (p-value)						0.724

Notes: Robust standard errors clustered at the municipality level are in parentheses. Inference: *** p<0.01, ** p<0.05, * p<0.1. In columns 1-8, we take the log of the independent variables. In column 5 the excluded instrument is the 1979 transfers, and Current transfers is the instrumented variable. In column 6 the excluded instruments are the 1979 transfers and its squared values; Current transfers is the instrumented variable. Municipality level controls include: population size categories; density of population; number of bed places in tourist accommodations; km of roads within the municipality; share of young, and share of old population; unemployment rate; dummy variables for the municipality being located in a mountainous area; number of per capita non-profit organizations. First stage F-statistics of the excluded instruments are reported. The Sargan-Hansen test is a test of overidentifying restrictions is reported (the joint null hypothesis is that the instruments are valid instruments, i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation).

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3.3 Pooled-2SLS

As previously mentioned, we also adopt an instrumental variable approach based on the 1979 intergovernmental transfers to the municipalities as an instrument for the current transfers in the period of our analysis. In this section, first we discuss the validity of this instruments, both on the basis of a narrative analysis of the Italian public finance in the last forty years and on the basis on the usual statistical tests. Then, we show the results based on a pooled two-stage least squares (pooled-2SLS) estimation of the equation (10) augmented with the usual set the controls at municipality and municipality-year level, and province-fixed and year-fixed effects.

The amount of 1979 intergovernmental transfers to municipalities is highly correlated with the amount of intergovernmental transfers in the period 2003-2014. Looking back at the beginning of the 1970s, we observe a dramatic reduction of the tax revenue autonomy of the Italian municipalities, which was compensated by a large amount of central government transfers. However, between 1972 and 1976, the outburst of inflation (and the consequent growth of nominal interest rates) widened the gap between nominally set revenues and the current expenditures of municipal governments, which was covered by loans granted by commercial banks and publicly owned financial institutions. The result was that in 1977, the total stock of outstanding debt of municipalities was more than three times as much as at the beginning of the decade.

To face local public finance instability, in 1977-1978, the following emergency measures were introduced by two central government decrees (the so-called "Decreti Stammati", upon the name of the Italian Ministry of Treasury): The central government assumed direct liability for municipal debt (including interest expenditure) issued before 1977; the future growth of current expenditures was capped by law, and restrictions were put on local public employment; a budget-balance rule and restrictions on municipal government borrowing were introduced (in particular, debt financing of current expenditures was prohibited); and, finally, transfers from the central government were increased to balance the budget of each municipality approximately, and they were established as an ordinary financing mechanism with a centrally determined growth rate. As for the latter measure, note that the basic determinant of the new granting system was the pre-1978 expenditure levels (i.e., the so-called "historical expenditure" criterion such that higher transfers were allocated in 1979 to those municipalities that had higher pre-1978 expenditure levels).

However, the correlation between the 1979 transfers and today's transfers is not perfect, and this limits the concerns that the chosen instrument suffers of similar problems of the endogenous variable. In fact, the recursive process of allocation of transfers has led to a gradual reduction of the direct effect of the 1979 transfers over time because of the annual marginal adjustments of distribution criteria and, particularly, of some specific events that have reduced the weight of the "historical expenditure" criterion in the allocation of transfers to municipalities (such as the 1992 introduction of a local property tax that was compensated for by a correspond-

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ing drop in that municipality's transfers).[18]

At the beginning of the 1990s, more than 50% of the transfers paid to local governments were still dependent on the debt accumulated (to cover the expenditures) before the 1977-1978 reform (Emiliani, 1997). In May 2009, the first article of the new law on fiscal federalism (Law 42/09) pointed out among its main objectives: "[..] ensuring revenue and expenditure autonomy of municipalities [..], so as to gradually replace, for all levels of government, the criterion of historical expenditure." In other words, more than three decades after the 1977-1978 reform, the Italian municipal finance framework is still largely affected by that criterion.[19]

In Table 2, column 3, the first-stage estimation results are reported for our sample. The positive and statistically significant estimated coefficient of the 1979 transfers as well as the first-stage F-test confirm that the instrument is relevant.

The 1979 transfers are unlikely to influence the arrears' formation through channels we do not control for. For instance, one might argue that the 1979 transfers have shaped the municipality's subsequent spending and revenue capacity, and socio-economic conditions, which are all factors that can have a direct effect on the arrears. In fact, our set of control variables in M, MT, and particularly the current level of average taxable income, observed each year and in each municipality, can account for a very large set of (possible) other channels through which the 1979 transfers might have an effect on the dependent variable.[20] Moreover, it should

[18]The amount of transfers to each municipality decided by the central government is composed, for the sake of simplicity, by (i) the amount of transfers the municipality has received in the previous year, and (ii) an adjustment factor that depends on (a) an annual growth rate common to all municipalities, and (b) a compensation component specific for each municipality. When determining the amount of granted transfers, the weight of each component can change from one year to the another. An important weight was attached to the first component, which is influenced by the 1979 transfers.

[19]To the best of our knowledge, we are the first to exploit the 1977-1978 important and largely exogenous break in the institutional setting of Italian municipal public finance and to take into account the effect of the "historical expenditure" criterion for instrumenting the current transfers. Other papers have analysed the political determinants of the heterogeneity of the total transfers; see, among others, Solé-Ollé and Sorribas-Navarro, 2008 for the case of Spain, Brollo and Nannicini, 2012 for Brazil, and Bracco and Brugnoli, 2012 and Bracco et al., 2015 for Italy.

[20]A specific concern is related to the lack of "budget responsibility" of municipalities. In fact, because higher transfers were allocated in 1979 to those municipalities that had higher pre-1978 expenditure levels, one might suspect that those municipalities had a tendency to fiscal profligacy. If for some reason this behaviour is still at work in those municipalities, there might be a positive correlation between the 1979 transfers and the lack of "budget responsibility" in municipalities. Although we cannot fully exclude this channel, two facts have to be pointed out. First, "financially irresponsible" municipalities typically tend to increase their current expenditures (e.g., for employees, for consultancy services and so on), while our focus is on the arrears on expenditure commitments for public investments. Second, in cases of a perpetuation over decades of non-correct use of public money within a municipality, we would observe that today's higher transfers (because of higher 1979 transfers, and thus higher pre-1978 expenditure) are associated with higher arrears (i.e., a higher level of missing expenditure payments). Thus, if this were the case, the coefficient of transfers on arrears would be upward biased.

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be noted that the timing and features of the 1977-1978 reforms were largely unexpected by municipal policy makers. In turn, the latter could not anticipate the impact of the new mechanism by increasing pre-1978 expenditures to ensure larger future transfers. This anticipation would have meant that municipalities increased their expenditures because they expected a bail-out by the central government, followed by the introduction of the "historical expenditure" criterion for the allocation of future transfers. However, we have not found any evidence of the presence of such an expectation in the political debate or among the stakeholders of that period.

The second-stages of the 2SLS estimations of the impact of the current intergovernmental transfers on the municipalities' arrears are reported in column 5. The estimated coefficient of the instrumented current transfers is negative and statistically significant, supporting the hypothesis that larger cuts to intergovernmental transfers bring to an increase of arrears on committed investment expenditure.

Since we cannot conduct an exogeneity test in a perfectly identified model, as an additional evidence, we use both the linear and squared term of the 1979 transfers as instruments in a over-identified 2SLS. This specification can capture potential nonlinearity between the 1979 transfers and today's transfers, as show in the column 4. In column 6, the second-stage results are reported and confirm a negative and statistically significant coefficient of the instrumented transfers. The first stage F-statistics and the Sargan-Hansen test of overidentifying restrictions show that the instruments are relevant and valid (i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation).

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Table 3 – Robustness checks

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimator	Within	2SLS	Within	2SLS	Within	2SLS	Within	2SLS
Dependent variable: log of				Arrears				
Sample				Full			<15,000 inhab.	
Current transfers	-0.019***	-0.228***	-0.016**	-0.151***			-0.014**	-0.221***
	(0.007)	(0.055)	(0.007)	(0.053)			(0.007)	(0.063)
Investment expenditure	1.066***	1.051***	1.062***	1.055***	1.066***	1.056***	1.070***	1.063***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Interest expenditure	0.033***	0.006	0.009	0.004	0.038***	0.006	0.032***	0.012
	(0.009)	(0.007)	(0.010)	(0.007)	(0.009)	(0.006)	(0.009)	(0.007)
Av. Taxable income	-0.085	-0.104***	0.020	-0.062	-0.079	-0.094**	-0.071	-0.106**
	(0.082)	(0.040)	(0.086)	(0.040)	(0.082)	(0.044)	(0.084)	(0.047)
Stock of arrears	0.026***	0.059***						
	(0.008)	(0.006)						
Central government transfers					-0.021***	-0.164***		
					(0.005)	(0.056)		
Municipality controls	NO	YES	NO	YES	NO	YES	NO	YES
Municipality FE	YES	NO	YES	NO	YES	NO	YES	NO
Province FE	NO	YES	NO	YES	NO	YES	NO	YES
Province-year FE	NO	NO	YES	YES	NO	NO	NO	NO
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	74,460	74,460	74,460	74,460	74,460	74,460	67,676	67,676
R-squared	0.783	0.814	0.791	0.822	0.783	0.814	0.792	0.821
F-test of excluded instruments		116.41		121.76		104.24		86.62
Hansen J (p-value)		0.473		0.782		0.390		0.484

Notes: Robust standard errors clustered at the municipality level are in parentheses. Inference: *** p<0.01, ** p<0.05, * p<0.1. In columns 1-8, we take the log of the independent variables. In columns 2, 4, 6, and 8 the excluded instruments are the 1979 transfers and its squared values; Current transfers is the instrumented variable in columns 2, 4, and 8 (Central government current transfers in column 6). Municipality level controls include: population size categories; density of population; number of bed places in tourist accommodations; km of roads within the municipality; share of young, and share of old population; unemployment rate; dummy variables for the municipality being located in a mountainous area; number of per capita non-profit organizations. First stage F-statistics of the excluded instruments are reported. The Sargan-Hansen test is a test of overidentifying restrictions is reported (the joint null hypothesis is that the instruments are valid instruments, i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation).

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4 Robustness checks and further results

In this section, first we propose a set of robustness checks to further control for the validity of our estimation results and the consistency of their interpretation with our main prediction (Section 4.1).[21] Then, we report further sets of results based on alternative outcome variables (Section 4.2).

4.1 Robustness checks

The first concern is about the role of the stock of arrears at the beginning of the year. One might argue that the formation of new arrears each year is influenced by the stocks of arrears accumulated in previous years. In fact, on the one hand, municipalities with a larger stock of arrears could tend to systematically have higher new arrears, with respect to the other municipalities. On the other hand, a municipality with a larger stock of past arrears could tend to reduce the formation of new arrears over the year to avoid greater difficulties with future payments. To control for this factor, we include in the model specification (10) the stock of arrears on expenditure commitments for public investments that is recorded at the beginning of the year. Estimation results in Table 3, columns 1 and 2, show that the coefficient of the stock of arrears is positive and significant and suggests that an increase in the stock of arrears within a municipality translates into a larger amount of new arrears. As for the effects of transfers, investment expenditure, and debt interest expenditure on the arrears, estimations results confirm the main estimation results in terms of sign, magnitude, and statistical significance.

In columns 3 and 4 of Table 3, we report estimation results after including province-year fixed effects in the model specification. This is an important control as it aims at taking into account a very-large set of time-varying characteristics and exploiting the variation, in any given year, among the municipalities within each of the 86 provinces in our sample. The estimation results show that the inclusion of these fixed effects do not change our main findings.

In columns 5 and 6, we use the amount of transfers received by each municipality from the central government as an alternative to total current transfers. This is the most exogenous component of the current transfers as this variable typically cannot adjust to the needs of the single municipality. Our estimation results remain stable with this change.

We also run an additional robustness check to verify whether our estimated relationship holds in small municipalities and is not driven by the presence of larger municipalities in the sample (in Italy, and in our sample, about 91% of municipalities have a population below 15,000 inhabitants). Although we already control

[21] Each change introduced to the estimated empirical model or analyzed sample is estimated using different approaches. However, for reasons of space, in Table 3, we only report the estimation results obtained with the within estimator and the pooled 2SLS regressions. Estimation results obtained with the other approaches are similar and are available upon request.

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for population size in our model specifications, we estimate our model (10) on the sub-sample of municipalities with a population below 15,000 inhabitants. In fact, in Italy, municipalities with below 15,000 inhabitants have a different electoral system than larger municipalities, and we might be interested in controlling whether different political contexts influence our results (a single ballot system is in place for municipalities with fewer than 15,000 inhabitants, while a dual ballot system is in place above that threshold; see, among others, Barone and de Blasio, 2013). The estimation results reported in Table 3, columns 7 and 8, show that our main estimation results maintain after this further control.

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Table 4 – Alternative outcomes

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimator	OLS	Within	OLS	Within	OLS	Within	OLS	Within
Dependent variable:	log of Payments		%Ch. Stock arr.		Tax revenues		log of Duration	
Current Transfers	0.024*	0.062***	-0.044***	-0.018***	-0.079**	-0.080**	0.067***	-0.012
	(0.014)	(0.014)	(0.005)	(0.007)	(0.035)	(0.037)	(0.020)	(0.040)
Investment expenditure	0.552***	0.478***	0.255***	0.312***			0.022**	0.014
	(0.006)	(0.006)	(0.003)	(0.004)			(0.010)	(0.015)
Interest expenditure	0.020	-0.138***	-0.053***	-0.081***	1.834***	1.009**	-0.011	-0.042
	(0.012)	(0.018)	(0.003)	(0.008)	(0.323)	(0.429)	(0.013)	(0.037)
Av. Taxable income	0.256***	0.201	-0.094***	-0.203***	0.017***	0.006***	-0.041	-0.072
	(0.077)	(0.164)	(0.021)	(0.075)	(0.002)	(0.002)	(0.084)	(0.401)
Municipality controls	YES	NO	YES	NO	YES	NO	YES	NO
Municipality FE	NO	YES	NO	YES	NO	YES	NO	YES
Province FE	YES	NO	YES	NO	YES	NO	YES	NO
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	74,459	74,459	65,128	65,128	74,386	74,386	12,868	12,868
R-squared	0.354	0.254	0.221	0.255	0.488	0.303	0.081	0.005

Notes: Robust standard errors clustered at the municipality level are in parentheses. Inference: *** p<0.01, ** p<0.05, * p<0.1. In columns 1-4 and 7-8, we take the log of the independent variables. Municipality level controls include: population size categories; density of population; number of bed places in tourist accommodations; km of roads within the municipality; share of young, and share of old population; unemployment rate; dummy variables for the municipality being located in a mountainous area; number of per capita non-profit organizations.

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4.2 Alternative outcome variables

In this section we show some further evidence of the effects of the transfers on alternative outcome variables with a twofold aim. On the one hand, we show evidence of the goodness of our dataset and model specification in predicting the effects of the transfers on alternative outcomes for which we have theoretical predictions (see Section 2.2) or intuitions. On the other hand, we show that municipalities receiving higher levels of transfers do not systematically select public investment projects of shorter duration (so that we can exclude that the lower arrears are simply driven by the shorter life of the projects).

First, we test the conjectures that if higher transfers reduce the formation of arrears, we would expect that higher transfers increase payments for expenditure commitments for public investments for the year's (*Payment*) and reduce the stock of arrears during the year (*%Ch. Stock arr.*). The estimation results in Table 3 columns 1-4, confirm these conjectures.

Second, a prediction that can be drawn from our theoretical model is that higher transfers lead to lower tax revenues. The estimation results in Table 4, columns 5-6, indicate that, in our data, higher transfers are actually significantly associated with lower tax revenues. It can also be noted that the coefficient *Av. Taxable income* is positive, statistically significant, and smaller than the coefficient of transfers: a marginal increase in taxable income is thus associated with an increase in tax revenues by a smaller quantity than a decrease in transfers. These findings are particularly interesting in the light of the literature on the flypaper effect (i.e., the empirical phenomenon that results when an increase of one euro of transfers leads to significantly greater public spending than an equivalent euro of citizen income, and it does not translate into a one-euro reduction of tax revenues or an increase in public spending).[22] Although in this paper we are not directly interested in the effect of transfers on taxation choices, these findings, together with our results on the negative effect of the transfers and taxable income on arrears reported in Table 2, suggest that one of the reasons why transfers do not fully translate into a similar reduction in tax revenues could be related to the presence of a third channel: part of the transfers are used by the municipalities to reduce trade debt (i.e., arrears). We believe that this represents a first evidence which deserves further research.

Finally, we test whether municipalities receiving higher levels of transfers systematically select public investment projects of shorter duration. We use the variable (*Duration*) that represents the days of expected duration of the procured projects for public works by a sample of 2,517 municipalities between 2003 and 2006 (the sample is obtained by merging our dataset with that of Coviello et al. (2018), who use AVCP data containing information on the characteristics of public works with a value greater than 150,000 euros for the period 2000-2006). If this were the case, the estimated negative relationship between transfers and arrears could be explained by

[22]See Inman (2008) for a survey, and Gennari and Messina (2014) and Bracco et al. (2015) for recent empirical analyses on Italy.

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the shorter life of the projects. Our estimation results in Table 3, columns 7-8, are reassuring, as they actually show that levels of transfers are not associated with a shorter duration of projects.

5 Conclusion

The reduction of transfers from the central government to local ones is widely adopted in an attempt to decentralize the fiscal consolidation process. However, if a cut in transfers translates into higher arrears on expenditure commitments for public investments at the municipal level, the pursued consolidation objectives will be partly frustrated.

In this paper we have first presented a simple theoretical framework to build up the testable hypothesis: when there is no effective control over the use of arrears and budget-balance rules are imposed, hardening fiscal constraints by cutting intergovernmental transfers can lead municipal governments to relax the constraints by increasing their expenditure arrears (i.e., a non-conventional form of short-term trade debt).

Then, we have tested this prediction using a large dataset of Italian municipalities for the period 2003-2014 and different estimators to control for omitted variable problems. In particular, we have adopted an instrumental variable approach relying on the structural break that significantly changed the Italian local public finance in 1977-1978 and on the central role played by intergovernmental transfers in driving municipal fiscal policy. Our main estimation results indicate that a reduction of 10% in the per capita intergovernmental transfers to a municipality is associated with an increase of 1.7% in arrears on municipal expenditure commitments for public investments. This adds to intuitive adjustments of tax revenues.

These empirical results, confirmed by several robustness checks, highlight novel and perverse effects driven by the (mis)management of intergovernmental transfers. In particular, on the one hand, our findings provide new evidence about the costs of hardening financial constraints on the fiscal decentralization process; on the other hand, our findings suggest that further research on the design of optimal, exogenously imposed fiscal restraints should carefully take into account local governments response. Last, but not least, as is widely recognized, central governments should devote far more effort and resources to the collection of precise and systematic data on public expenditure arrears, as this is key for future assessments of the undesired side-effects of fiscal policies.

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Fiscal Consolidation by Intergovernmental Transfers Cuts? The Unpleasant Effect on Expenditure Arrears

Highlights

- Fiscal consolidation is often implemented through cuts in intergovernmental transfers
- Local governments can choose to relax the induced constraints via expenditure arrears
- In Italy, lower transfers are empirically associated to higher arrears
- Arrears are a form of trade debt that partially frustrate the consolidation goals

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