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PUBLIC FINANCE, GOVERNMENT SPENDING AND ECONOMIC GROWTH: THE CASE OF LOCAL GOVERNMENTS IN ITALY

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Public finance, government spending and economic growth: the case of local governments in Italy

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Abstract

This paper contributes to the empirical literature on the linkages between decentralized government spending, public finances, and economic growth at the local level. The impact of local government spending on output growth is estimated using a panel of Italian Labor Market Areas - a group of municipalities adjacent to each other, geographically and statistically comparable, characterized by common commuting flows of the working population - during the 2002-2012 period. The attention is focused both on current and capital expenditures as well as on several spending categories. To handle endogeneity problems between public spending and economic development, a system generalized method of moments has been used. The findings indicate a fairly robust negative relationship between local current government expenditure and economic growth. Investment in capital budget turns out to be not statistically significant when the public spending composition is taken into account. Municipalities located in central-southern regions show, instead, negative growth effect of capital spending, underlining the importance of measuring the efficiency of public spending rather than just being concerned with the absolute level of output. Only few of the expenditure categories (Justice, Tourism and Culture) exhibit positive effects on growth, while Administration & Management and Roads & Transportation have negative growth effect in southern regions.

Keywords— Government size; Fiscal decentralization; Local expenditures; Growth

JEL codes— H11; H72; O43

1 Introduction, motivation and research questions

Differences in the size of government and in the composition of public expenditures may help to explain variation in economic development between countries and areas of the same country. Especially the composition of public expenditures can be viewed as the key instrument to promote economic development. Indeed, provided that government spending can foster economic activity and output growth at multi-level governments, an important task for the policymaker is to identify the expenditure categories that have the strongest impact on growth, and subsequently select the best alternatives to finance those growth-enhancing programs. However, determining whether an increase in public spending has a positive impact on economic development and performances is a difficult task, which employs theoretical and empirical considerations.

Theoretical arguments propose that public expenditures could positively influence growth in the long-run through the use of public sector inputs in private production functions (Barro, 1990, Devarajan et al., 1996). Indeed, one of the channel through which government spending may be growth enhancing is by providing (positive) externality-generating public goods and services through productive investment in private sector development (to the extent that it is concentrated on infrastructure construction). The impact of a fiscal policy on economic growth may be split into tax- and expenditure-based aspects (Tanzi and Zee, 1997). Some taxes levied to fund public expenditures may lead to distortions on the investment decisions. Indeed, both the level of taxes as well as the structure of the tax system have consequences on economic growth. Taxation may be an obstacle to growth, by creating disincentives to accumulate physical and human capital depending on its sensitivity to the production technology of the economy and by negatively impact labour supply retarding economic growth. When expenditures are considered, growth effects are more ambiguous. Some public expenditures may positively affect private sector productivity while other may be unproductive, having only impact on citizens' welfare. Public expenditures improve welfare if the benefits from these spending exceed private opportunity costs. Furthermore, government activities to secure property rights and enforce contracts are essential. Public spending can stimulate private sector productivity also through positive externalities produced by public goods. Conversely, higher public spending may also reduce private investment and production (Alesina et al., 2002). The long-run growth effects depend upon a combination of the relative productivities of these expenditures and their relative budget shares (Devarajan et al., 1996). The net effect could be also irrelevant if the negative effect on growth rate due to higher tax rates could be balanced out by the positive effect due to productive government expenditures that are financed by the higher tax rate (Dalgaard and Kreiner, 2003).

Our work is related to a vast empirical literature investigating the relationship between government size and economic growth, as well as exploring the growth effects of different public expenditures' categories. However, most of the existing studies are based on cross-country regressions, and their results are still inconclusive. Government size has positive impact, at least in the short-run for both developed and less-developed economies (Lin, 2006) and a negative effect (Roy, 2009) on economic growth rate. There is evidence of a negative and statistically significant impact of public expenditure on economic growth measured by the growth rate of per capita real GDP – hereafter GDPc (Afonso and Furceri, 2010), but not statistically significant for the negative effect of taxes (Fölster and Henrekson, 2001). Government size as a percentage of GDP has

an inverted U-shaped effect on the growth rate of the human development index, and this effect is more substantial in developed and high-income countries (Martins and Veiga, 2014).

The available evidence points at demonstrating that expenditure composition matters. The increase in the share of education spending tend to be growth-enhancing (Acosta-Ormaechea and Morozumi, 2013); instead, the shares of defence, education, and social protection expense in total public expenditure have inverted U-shaped relationships with development; lastly, health and the group of remaining expenses have U-shaped relationships (Martins and Veiga, 2014). According to a number of authors this is not surprising since the negative relationship only applies for relatively rich countries with a large public sector, in which an increase in public spending can harm the productivity incentives for the private actors. It has been also showed a highly significant and positive relationships between growth and expenditures on education, transportation, health, welfare, and public safety (police and fire), but a negative and significant relationships between output and employment in health care and public safety services (Murova and Khan, 2017). Summing all this up, the general evidence supported by the existing literature is a fairly robust negative relationship between government size and economic growth. At the same time, there is considerable difference between the effects associated with current and capital expenditures (with the latter not influencing growth negatively) and among different spending categories.

Our work is also related to the less-debated strand of the literature that considers local governments within countries. Importantly, with the notable exception of De Mello Jr (2002), Schaltegger and Torgler (2006), Acconcia et al. (2014), Di Liddo et al. (2018), Luintel et al. (2020), to the best of our knowledge much less attention has been paid to the sources of economic growth at the municipal (local) level. We believe that investigating whether and how government size affects economic growth focusing on sub-national governments' data (rather than national ones) is particularly interesting. Indeed, resources can be mobilized more efficiently in local government jurisdictions in order to finance growth-enhancing expenditures at the territorial level. Such attention to the local economic development assumes even more importance in countries where fiscal decentralization programs have been implemented. In any case, if public spending can have a specific economic-stimulus impact, it is much more likely that this is more evident at local level. Here, the public money is tied to practical actions and interventions near where it is used for growth-enhancing purposes, such as services for companies' productivity and/or employees benefits for sustaining private consumptions.

This paper proposes an empirical analysis of the impact of local government spending on output growth in Italy. Specifically, we address the following research questions: (i) Does local public spending affect (local) economic growth? (ii) Do the type and the composition of public spending matters for economic growth? We focus the attention to the potential effects of public expenditures on economic development, focusing both on total public current and capital expenditures as well as on specific functional spending categories. We answer these questions by employing an econometric analysis that uses Italian municipal-level data from 2002 to 2012 in Italy. The level of fiscal autonomy in Italy makes the analysis of the public expenditures-growth effects an interesting case, potentially useful for its external validity to international cases. Municipalities are free to set tax rate (personal income tax rates are among the main source of revenue) as well as tax exemptions and tax deductions. Local authorities may even conduct their own economic policy, by autonomously making decisions about spending priorities and the composition of expenditures. Municipalities also separate

public spending for current purposes from spending for investments; this feature allows an analysis to separate the effect of public expenditure for operating budgets from those of capital budgets. Given that growth output at municipality level is a not available information, we rely on labor market areas (LMAs) corresponding to a deeper territorial disaggregation than NUTS 3 level subdivisions. LMAs are a group of municipalities - akin to the UK's Travel-to-Work-Areas - adjacent to each other, geographically and statistically comparable, characterized by common commuting flows of the working population. According to the Italian Statistical Office (ISTAT), they represent the geographical place where individuals live and work. More importantly for the purpose of this analysis, there are the geographical areas where their economic and social relationships take place (see Section 3 for more details on the LMAs). This paper is the first attempting to explore the relationship between public expenditure and economic growth over a geographically restricted area such as LMAs in Italy. This approach also implies that institutional, legal and cultural factors are more adequately controlled and territorial borders are more accurately bounded than when considering municipalities as administrative entities and unit of analysis.

Furthermore, while the pathways through which public expenditures can act to raise local economic development are clear, empirical evidence documenting the existence of a causal relationship is still scarce. Indeed, a matter of concern to empirical studies of economic development is the possibility that the explanatory (spending) variables are endogenous due to omitted variables or reverse causality. We face this challenge by employing the system generalized method of moments (GMM) estimator, controlling for the potential endogeneity of the spending explanatory variables by using their lagged instruments in the first-difference and level equations (see Section §4). While we do not claim to have fully resolved the endogeneity concerns, under the maintained assumption that lagged spending is exogenous to current output, we do carefully address potential endogeneity problems.

Finally, to further elaborate the LMA budget constraint, we take into account in the empirical specification that total expenditures must be financed by revenues and/or the budget surplus/deficit (Kneller et al., 1999, Gemmel et al., 2011, 2016, Morozumi and Veiga, 2016). This allow us to interpret the coefficients on capital and current spending as capturing the effects of a rise in the respective spending financed by an equal rise in the deficit.

The results indicate that the government size significantly hinders economic growth. Particular features exist, however. It is important to disentangle current from capital spending. Current spending reveals a significantly strong negative impact on economic prosperity of municipalities. Investments in the capital budget have, instead, a lower detrimental effect (both in statistical significance and size) on economic growth. Furthermore, investment in capital budget turns out to be not statistically significant when the public spending composition is taken into account. These findings underscore the importance of different incentives provided by the spending policies and confirms that the type of government expenditure matters for economic growth, even (and presumably more) at local level. The negative growth effects of both current and capital spending is heterogeneous across the characteristics of the LMAs. Increasing total public current and capital spending has an output effect that is negative and statistically significantly different from zero in certain circumstances. LMAs located in central-southern regions show negative growth effect of both current and capital spending underlining the importance of measuring the efficiency of public spending rather than just being concerned with the absolute level of output. Turning to the spending categories, the empirical evidence shows that only few of the expenditure

shares (Justice, Tourism and Culture) exhibit a positive effects on GDPc. LMAs located in southern regions also show negative growth effect when analysing spending dedicated to Administration & Management and Roads & Transportation – as discussed in Section §7, this can be related to the efficiency of this spending.

The remainder of this paper is structured as follows. Section §2 reviews the existing literature on the relationship between public expenditure and economic development at local level. §3 describes the institutional framework of the Italian public sector. Section §4 describes the methodology and the data. Section §5 presents and discusses the results. Section §6 provides some robustness checks. To conclude, Section §7 contains policy implications.

2 Public expenditure and economic development at local level: existing literature

Only few academic papers investigate the effect of state and local spending on economic growth. De Mello Jr (2002) evaluates the impact of local government spending on output growth using a panel of Brazilian municipalities during the period 1985–1994. He finds that only three expenditure categories, such as housing and urbanization, health and sanitation, as well as transport services, are growth-enhancing at local level, concluding that municipal economic growth depends to a large extent on the provision of public goods and services by local governments. Schaltegger and Torgler (2006) study the relationship between public expenditure and economic growth using the full sample of state and local governments (cantons) from Switzerland over the 1981–2001 period, detecting a negative relationship between government size and economic growth. More specifically, they test the effect of government spending of the operational budget separately from the impact of investment spending from the capital budget finding that an increase in public spending from operating budgets significantly reduces growth while there is no significant impact on economic growth by expenditure from capital budgets. Acconcia et al. (2014) provide evidence of a short-run output effect of public spending at province level, over the ten year span between 1990 and 1999 in Italy. The authors consider public investment in Italian provinces and instrument the expenditures by exploiting an Italian law which, upon evidence of Mafia infiltration in a city council, mandates the dismissal of all elected officials. They also find no relevant spillovers of spending shocks in a province on the economic activity of nearby provinces. More recently, Di Liddo et al. (2018) empirically assess the relationship between government size, decentralization and economic growth among Italian regions for 14 years (1996–2009). Their results point at showing the existence of an inverted U-shaped relationship between public expenditure and economic growth, which is dependent upon the degree of fiscal decentralization, suggesting that in designing fiscal policies aimed to promote economic growth, the distribution of public expenditures across different tiers of government and its size should be simultaneously taken into account in order to maximize the potential economic growth. Luintel et al. (2020) investigate the importance of local government spending in the dynamics of real income per capita growth for 31 provinces in China between 1991 and 2016, showing that welfare spending on education and health contributes significantly more to growth and convergence than capital and infrastructure spending. They suggest that political competition for places in the upper levels of the party hierarchy creates the conditions for the capital bias in local public spending, unless promotion criteria can be adjusted

to give credit for human capital investments.

Taken together, the results emerging from the (still limited) existing evidence about the topic of interest are somehow controversial. In general, the amount of current/operational expenditure seems negatively associated with economic growth, with the notable exception of certain expenditure categories in specific contexts. No statistically significant effect is reported for public investments, though.

3 Institutional framework

In Italy, there are four administrative government levels: central government, regions, provinces and municipalities. There are 20 regions (equivalent to NUTS 2 administrative level), of which five have a special autonomous status. Furthermore, Italy counts 107 provinces (intermediate level between municipalities and regions, corresponding to NUTS 3 administrative level), which have recently been reformed by law 56/2014 that reduced their public competences and eliminated the possibility of direct elections of their own representatives. The smallest level of local jurisdiction is represented by the municipalities. The municipal level of government includes over 8,000 authorities. The average population size is of around 7,000 inhabitants (although huge variation and heterogeneity exists), and the number of cities above 100,000 inhabitants is only around 40, just two of them exceeding one million residents, and more than half localities having less than 3,000 residents. Municipalities are responsible for several public functions such as providing local police services, public transportation, road development and other infrastructural spending, sport, culture and other leisure activities as well as ancillary services to education for kids. On the revenue side, municipalities can rely on transfers from upper levels of government (both from the central government and from the regions) that can stimulate municipality expenditures. Moreover, municipalities can count on their own revenues linked to the collection of a municipal tax paid yearly by real estate owners and of a share of the personal income tax. Duties due for waste collection as well as several type of fees, such as parking permits and occupation of public areas, constitute another revenue source.

Unfortunately, data on economic growth at municipal level is not available. Therefore, in order to consider the importance of the spending-economic development relationship at sub-national level, we rely on Labor Market Areas (LMAs). LMAs correspond to sub-regional geographical areas where the bulk of the labour force lives and works (see also Destefanis et al. (2014), Faggian et al. (2018)). Operationally, LMAs stand for a group of municipalities - akin to the UK's Travel-to-Work-Areas - adjacent to each other, geographically and statistically comparable, characterized by common commuting flows of the working population. According to the definition by the Italian Statistical Office (ISTAT), they represent the place where the individuals live and work and, above all, where their economic and social relationships take place¹. Nearly half of the LMAs (314, equal to 47.7% of the total) stands in the size class from 10 up to 50 thousand inhabitants, whereas the highest density of the population (3957.2 per square kilometre) lives in the LMAs of Naples. Rome is the biggest LMA in Italy. Sicilia is the region with the highest number of LMAs in Italy (77) followed by Lombardia (58) and Campania (54). Piemonte, Trentino-Alto Adice, Veneto and

¹According to the ISTAT procedure, LMAs are defined on a functional basis, more than on a purely geographical one. The key criterion is the proportion of commuters who cross the LMA boundary on their way to work.

Marche are the regions with around 30 LMAs while Lombardia, Emilia-Romagna, Toscana, Campania, Puglia, Calabria and Sardegna are those, instead, with a number of LMAs between 40 and 50. On the contrary, Molise and Valle d’Aosta, showing 9 and 3 LMAs respectively, are those with the smallest number of areas. Piemonte, Lombardia, Veneto, Emilia-Romagna, Toscana, Lazio, Campania, Puglia and Sicilia are the regions with the highest number of resident population and both of the number of individual living and working in the LMAs. See Figure 1, Panels A and B, for a graphical representation of the LMAs and regions’ territorial location in Italy, respectively. Table 1, instead, summarizes some LMAs characteristics by regions and territorial location while Table 2 shows the number of LMAs in the sample and in Italy by macro-areas.

[Figure 1 around here]
[Tables 1 and 2 around here]

4 Methodology and data

4.1 Empirical specification and the municipality budget constraint

Formally, our empirical specification is given by the following dynamic panel model in which $GDPc$ in LMA i at time t is a function of lagged $GDPc$, of the ratio of total LMA expenditure, E , and of a vector of shares of K individual spending categories within the total municipality expenditure, e_j :

$$GDPc_{i,t} = \alpha GDPc_{i,t-1} + \beta (E/GDP)_{i,t} + \sum_k \gamma_k (E_{k,curr}/EGDP)_{i,t} + \delta Z_{i,t} + \mu_i + \tau_t + \epsilon_{i,t} \quad (1)$$

where $GDPc$ is the sum of the gross values added of all units divided by population in each LMA taken in logs, E is the total public expenditure. More specifically, we firstly include E_{tot}/GDP measuring total expenditures and then jointly both E_{curr}/GDP and E_{cap}/GDP measuring capital and current spending, respectively, where GDP is the log of the sum of the gross values added of all units². E_k is the k th share expenditure component. Z is a vector of control variables, μ is the LMA fixed effect, τ are year dummies controlling for time-specific effects, and ϵ is the classic error term. All fiscal variables are taken in logs.

Given the evidence provided by existing academic contributions (see section §2), we opted for keeping current expenditures separate from capital ones. While the negative correlation between total public spending and the rate of economic growth may be interpreted as evidence of a crowding-out effect (where public

²It is important to discuss the ratio *public expenditure/GDP* as a questionable measure of public sector size. It could be argued that such measure does not take into account other institutional factors that help to capture the real structure and dimension of government size, such as the vertical structure of government tiers, the political and electoral system, the bureaucratic weight of government on the open market functioning. Despite this consideration, spending has been largely used as a measure of government size in almost all the existing empirical, academic contributions (see Di Liddo et al. (2018) on this point).

expenditure displaces private sector productivity), it is reasonable to assume that investment spending may have a different impact on economic growth than transfer spending or public consumption (Schaltegger and Torgler, 2006). In order to get a more detailed picture of different public spending impacts on growth for the Italian sub-federal governments, we distinguish between spending from the capital budgets to finance investments and spending in the operating budget to finance current expenditure, with the aim of verifying the hypothesis that the former hamper economic prosperity, while the latter promotes it.

The vector of control variables (Z) includes a set of time-varying variables characterizing municipality's demographic and economic situation. More specifically, we include the density of municipal population (*Population Density*) – square kilometers divided by the population – in order to control for the presence of scale economies and congestion effects³. We also include the proportion of citizens aged between 0 and 4 years (*Share of children*) as well as the proportion of citizens aged over 65 years (*Share of elderly*) in order to control for public needs such as nursery services as well as nursing homes and services for elderly. Per capita taxable income (*Average income per capita*), controls for the tax base of the municipality. Finally, we also include a measure of the rate of growth in employment (*Labour growth*), such as the number of employed individuals at time t minus the number of employed individuals at time $t - 1$, to control for various local labour market influences. The last two variables are taken in logs.

The inclusion of years fixed effects controls for monetary and fiscal policy at national level as well as for national components of public investment and GDP common to all municipalities. LMA fixed effects address, instead, the potential endogeneity issues due to the possibility that LMA-specific characteristics may be correlated with spending allocation criteria (e.g. allocation of a higher amount of funding to relatively lower-growth LMAs to spur local economy). In this perspective, the determinants of economic growth must be interpreted as relevant for explaining differences across LMAs, and not their evolution over time.

A specific reflection on the role of revenues is also necessary here, given that the nexus between public spending (and its composition) and the revenues streams has been demonstrated in the academic literature (see, for example, Afonso and Furceri (2010)). To further elaborate the LMA budget constraint, we need to take into account that total expenditures, $E_{i,t}$, must be financed by revenues, $R_{i,t}$, and/or the budget surplus/deficit, $D_{i,t}$, each with potential output effects, since $D_{i,t} = R_{i,t} - E_{i,t}$ (Kneller et al., 1999, Gemmel et al., 2011, 2016, Morozumi and Veiga, 2016). As a result, to complete the model, (R/GDP) as well as (D/GDP) should be added to equation (1) in order to account for the different financing combinations assumed. Since the introduction of all the three variables would lead to multicollinearity, we decide to omit $D_{i,t}$, which

³The indicator *Population Density* also controls for the fact the local government spending is affected by the size of the local jurisdiction, measured by the resident population. The size of the municipality is also likely to affect the ability of the government to provide public goods and services adequately and improve the quality of life of local residents.

then becomes the reference status. Therefore, the main equation estimated in the empirical specification becomes the following:

$$GDP_{c_{i,t}} = \alpha GDP_{c_{i,t-1}} + \beta_1 (E/GDP)_{i,t} + \beta_2 (R/GDP)_{i,t} + \sum_k \gamma_k (E_{k,curr}/E_{GDP})_{i,t} + \delta Z_{i,t} + \mu_i + \tau_t + \epsilon_{i,t} \quad (2)$$

Estimates of equation (2) measure the effects of the fiscal variables on growth (e.g. an increase in expenditures or a decrease in revenue), particularly when financed by a change in the budget deficit. The coefficient on capital and current spending will capture the effects of a rise in the respective spending financed by an equal rise in the deficit.

Each regression included one of the $k = 1, \dots, K$ expenditure share elements, $E_{k,curr}/E_{GDP}$, where the included k th expenditure category is rotated across the K different categories and taken as percentage of GDP. We follow the approach proposed by Gemmel et al. (2016) and include each expenditure share in turn, rather than all $k - 1$ expenditures shares simultaneously, in order to save on degrees of freedom in the panel regression model which requires a large number of parameters to be estimated. Finally, for robustness, we also consider a model in which each regression includes one of the $k = 1, \dots, K$ expenditure share elements, $E_{k,curr}/E_{curr}$, where the included k th expenditure category is rotated across the K different categories and is taken as percentage of total current spending.

4.2 Addressing endogeneity

The main threat to the correct estimation of the effect of public spending-growth nexus stems from the likely endogeneity of the relationship due to omitted variables or reverse causality. In particular, some geographical areas may show higher levels of economic development (and dynamics in this variable) for reasons, other than public spending, that might be correlated to our measure of performance. For instance, changes to political and institutional settings may influence both fiscal variables and GDPc. Results may also be confounded by reverse causality problems due to potential simultaneity between GDPc and the fiscal variables such that changes in GDPc may also induce changes in the main fiscal variables. For instance, in situation of economic crisis, taxable capacity of the municipalities may be reduced and certain categories of expenditures, such as unemployment benefits as well as social benefits, may increase. In the likely case that the increase of such payments does not come at the expense of the other expenditures, then total spending will rise. Moreover, municipalities may have allocated funds in response to local developments, in ways that are not accounted for by municipality fixed effects.

This eventuality is absorbed, in our specification, by the effect μ_i , and can make our estimation invalid if not taken properly into account. Only other time-invariant characteristics correlated to local development and spending are absorbed by the effect μ_i ⁴. To eliminate μ_i in the dynamic panel specification

⁴Time-varying characteristics are absorbed by the error term and could eventually make

of the model, we use the two-step system GMM estimator with Windmeijer (2005) corrected standard error (Holtz-Eakin et al., 1990, Arellano and Bond, 1991, Arellano and Bover, 1995, Blundell and Bond, 1998). The GMM approach has been mainly used to tackle endogeneity issues in the nexus between public spending and economic growth (see among others, De Mello Jr (2002), Morozumi and Veiga (2016), Di Liddo et al. (2018), Luintel et al. (2020)). We instrument both total expenditure E_{tot}/GDP ; E_{curr}/GDP ; E_{cap}/GDP and revenue (R/GDP) by including lagged levels and differences. More specifically, we first difference the regression equation to remove any omitted variable bias created by unobserved municipality-specific effects. Then, we instrument the right-hand-side variables using differences of the original covariates to eliminate potential parameter inconsistency arising from simultaneity bias. This procedure consists of the difference dynamic-panel estimator, developed by Arellano and Bond (1991) and Holtz-Eakin et al. (1990). As shown by Alonso-Borrego and Arellano (1999) and Blundell and Bond (1998), when the explanatory variables are persistent over time, the lagged levels of these variables are weak instruments for the regression equation in differences. In order to reduce these further potential issues when using the difference estimator, the system-GMM estimator (Arellano and Bover, 1995, Blundell and Bond, 1998) is employed. This improves the quality of instruments also using the regression in levels (in addition to the regression in differences). In other words, first-differencing is exploited to eliminate the unobserved effect. Differences and lags two are used as instrumental variables for the differenced lagged dependent variable (i.e. as instruments for spending)⁵. Consistency of the GMM estimator depends on the validity of the instruments used. We check the accuracy of the model through the Sargan-Hansen test of overidentifying restrictions for the overall validity of the instruments⁶. The Arellano-Bond test is used to test the autocorrelation between the error terms over time (Arellano and Bond, 1991, Arellano and Bover, 1995, Blundell and Bond, 1998). All the tests, confirming the validity of the approach proposed here, are mentioned in the regression tables and are available on request⁷.

the results biased. Nevertheless, given also the period under analysis, it is hard to believe that there could be many time-varying variables that will bias our results. Anyway, we also include time dummies in the model capturing time-specific effects such as any variation in the outcome that happens over time (not attributed to other explanatory variables).

⁵Following Morozumi and Veiga (2016) to avoid the problem of instrument proliferation, we only use two lags as internal instruments because having too many instruments weakens the Hansen test of instruments' joint validity (see Roodman (2009)).

⁶Passing the Hansen test of over-identifying restrictions may convey little information about the validity of instruments (Deaton, 2010). However, the test is still relevant to signal the feasibility of the adopted instrument approach and whether the estimates change when we select different subjects from a possible set of instruments. Therefore, the test provides useful information on the feasibility of the adopted instrument approach.

⁷The use of system-GMM estimator could not completely solve all the endogeneity issues, as this estimation method assumes weak exogeneity of the explanatory variables, meaning that they can be affected by the past and current GDP growth rates but must be uncorrelated with future realizations of the error term. We implicitly assume that future unanticipated shocks to GDP growth should not affect the current value of the explanatory variables. The statistical validity of this assumption is supported by the results of the Sargan-Hansen test, which never

4.3 Dataset

The data used in our work come from a combination of different sources for the period 2002-2012; the procedure of collecting and combining the existing datasets is novel and represents a byproduct of this research (the final dataset is available on request from the authors, with some indicators not included for property rights). The main source of municipality financial data is represented by the Italian Public Authority Data (AIDA PA), a database of financial data of local public authorities in Italy, from which we retrieved information on total public expenditures and revenues as well as on public expenditure components. Financial data, expressed in 2012 real per capita values, are available at municipality level for over 8,000 municipalities. We exclude the municipalities with missing values of the variables used in the analysis and then we aggregate the financial data at LMA level. GDP per capita is constructed by updating the LMA value-added data from ISTAT with data from the Bureau van Dijk Italian Company Data (AIDA), a database containing comprehensive information on companies in Italy (we gratefully rely on the data used by Destefanis et al. (2014))⁸. Demographic and socioeconomic variables, such as total and share of the population, age structure, average income of inhabitants and labour growth, are instead collected from ISTAT. Again, data are collected at municipality level and then aggregated at LMA level.

Among municipalities' current expenditures, around 75% is allocated to the following missions: (i) Administration & Management, (ii) Roads & Transport services, (iii) Social Welfare and (iv) Planning & Environment. The remaining of the current expenditure is allocated to Culture, Tourism, Education, Justice, Municipal Police and Economic Development. A glance at the descriptive statistics also reveals some interesting features of the Italian context that are worthy of comment. Let us consider first the variables for the estimation of economic development. GDP is much higher in the north than in the south of Italy. This well-known phenomenon influences various aspects of the country's economy and society. On average LMAs located in northern regions do not differ from those in the southern regions as far as the absolute amount of current and capital spending is concerned. Central regions have, instead, a higher amount of current spending. The allocation of the current expenditures, as a share of the total current spending, differs among territories. Indeed, LMAs located in southern regions allocate a lower share of current expenditures in Social welfare and Education and a higher share of current expenditures in Planning & Environment with respect to their counterpart in the rest of the country. On the revenue side (municipal tax collection as well as transfer for upper levels of government), central regions can rely on a higher amount of sources that can stimulate municipality expenditures. Lastly, the controls inserted in the empirical analysis also show a certain degree of heterogeneity across macro-regions. LMAs located in the southern regions are characterized by worst labour con-

rejects the validity of the over-identifying restrictions.

⁸We rely on the 2002-2012 period as GDP per capita data is not available to us for years after 2012.

ditions, as measured by the rate of growth in employment, and socio-economic conditions, as measured by a measure of per capita taxable income, and by a higher density of the population. Areas do not seem to differ along the share of children and elderly individuals. Table 3 reports the descriptive statistics for the whole country and by macro-areas. A graphical representation of the financial data at LMA level are reported in Appendix in the supplemental data online (see Figures A1-A5, respectively). The final sample includes 6,690 municipalities, aggregated in 669 LMAs, observed from 2002 to 2012, which generates a balanced panel data set of 7,359 observations.

[Table 3 around here]

5 Results from the empirical analyses

This section is organized in two sub-sections. First, we examine the public spending-growth nexus without taking account the composition of the public spending (§5.1). Next, we explore the role of public spending composition considering the spending categories as a share of GDP and, for robustness, as a share the total spending (§5.2).

5.1 Testing for total public expenditure effects

Since total, current and capital expenditures ($E_{tot/GDP}$; $E_{curr/GDP}$; $E_{cap/GDP}$) and revenue (R/GDP) may be affected by economic development, they were treated as endogenous. The results of system-GMM estimations of the baseline model are shown in Table 4 and measure the effects of the fiscal variables on growth (e.g. an increase in expenditures or a decrease in revenue), particularly when financed by a change in the budget deficit. The coefficient on total, capital and current spending will therefore capture the effects of a rise in the respective spending financed by an equal rise in the deficit.

Table 4, Column 1, shows the results when total spending is included, revealing that increasing total public spending, financed by an increase in deficit, has an output effect that is negative but not statistically significantly different from zero. To further disentangle possible heterogeneity between key public spending categories and in order to get a more detailed picture of different public spending impacts on growth for the Italian LMAs, we distinguish between spending in the operating budget to finance current expenditure from the capital budgets to finance investments (public investments in physical capital and infrastructure). Results, summarized in Table 4, Column 2, reveal that increasing total public current spending, financed by a change in the (omitted) budget deficit, has an output effect that is negative and strongly statistically significantly different from zero. More specifically, the point estimate suggests that an increase by one percentage point in total current spending variable decreases the growth rate by around 7.2%. The significantly negative impact of spending on economic prosperity of LMAs also hold for investment spending, even though

it is only marginally significant and very low in size. Capital spending, in theory, is expected to have a growth-promoting potential, by contributing to the accumulation of public capital and thus raising the productivity of private firms (Turnovsky and Fisher, 1995, Glomm and Ravikumar, 1997). However, the results obtained through our empirical analysis show that increasing total public capital spending, financed by a change in the (omitted) budget deficit, has an output effect that is negative and statistically significantly different from zero, suggesting that an increase by one percentage point in total capital spending variable raises the growth rate by around 1.3%.

The other socio-demographic factors represent control variables to capture further LMAs specific characteristics. The coefficient of the *Average income per capita* is positive and significant, implying that GDPc is higher for increasing levels of income. The LMA level of growth decreases as the proportion of elderly individuals (aged over 65) as well as the density of the population increases, being the coefficients of *Share elderly* and *Population density* negative and statistically significant. Finally, the LMA level of growth increases as the growth employment increases, being the coefficients of *Labour growth* positive and statistically significant.

[Table 4 around here]

5.2 Testing for public expenditure composition effects

We now examine the effects associated with the composition of public spending, as measured by several expenditure categories taken as percentage of the GDP. To explore the potential effects of public spending composition on GDPc, we again focus on the specification in which changes in current and capital spending are implicitly funded by a change in the budget deficit⁹. As anticipated in the section §4.1, we include each spending categories one by one. The parameter on each expenditure share in regressions should be interpreted as the impact on long GDPc of switching spending into the included expenditure category (e.g., Justice) and away from remaining expenditure categories on a *pro rata* basis, holding total current spending constant as a ratio of GDP (see Gemmel et al. (2011) for a similar approach). A significant positive (negative) parameter indicates that the category in question has a greater (smaller) impact on GDPc than the remaining expenditure categories. Table 5 shows the results when spending in Administration & Management, Justice, Municipal Police, Education, and Culture has been considered; while Table 6 contains the results for spending in Economic Development, Tourism, Planning & Environment, Roads & Transport and Social Welfare. Consistent with the main results summarized in Table 4, Column 2, all the regressions reveal net negative spending growth effects when funded from increased budget deficits for current expenditures (the point estimate suggests that an increase by one percentage point in total current

⁹Give the empirical evidence provided in Table 4, our preferred specification disentangles current and capital expenditures. We also estimated a model by including only total spending (without disentangling current and capital expenditures). Results are available on request.

spending decreases the growth rate, on average, by around 7%). Interestingly, when we control for the spending categories, in contrast to public spending from operating budgets there is no significant impact on economic growth by expenditure from capital budgets, confirming the results showed by Schaltegger and Torgler (2006). When considering the spending categories specifically, the empirical evidence shows that some of the expenditure shares exhibit positive effects on GDPc that are statistically different from zero such as Justice (Table 5, Column 2), Culture (Table 5, Column 5) and Tourism (Table 6, Column 2). More specifically, a 1 percentage point increase in the Justice, Culture and Tourism share in GDP is associated, on average, with a higher level of GDPc of 0.4%, 2.84% and 1.5% than the counterfactual of an unchanged Justice, Culture and Tourism spending share, respectively¹⁰.

[Tables 5 and 6 around here]

6 Further evidence and robustness checks

This section is organized in three sub-sections. First, we examine the public spending-growth nexus depending on the level of economic development (§6.1). Next, we explore additional heterogeneity looking at the whether the results depend on the distribution of the total current expenditures (§6.2) and on the geographical position of the municipalities (§6.3).

6.1 Heterogeneity of LMAs depending on the level of local economic development

We examine whether the effects of public spending are dependent upon the distribution of the measure of economic development—in other words, whether the main results are driven by LMAs being located in areas characterized by high or low levels of economic development. To do this, we repeat the analysis by separating the LMAs located in areas with high economic development levels (i.e. with a GDP above the median) and the LMAs located in areas with low economic development levels (i.e. with a GDP below the median). Results are summarized in Table 7 (Column 1) and in Table 8 (Column 1), respectively. The empirical evidence reveals that increasing total public current spending, financed by a change in the (omitted) budget surplus/deficit has an output effect that is negative but not statistically significantly different from zero for LMAs located in areas characterized both by high and low levels of economic development. Interestingly, the results also show that increasing total public capital spending, financed by a change in the (omitted) budget surplus/deficit, has an output effect that is negative and statistically significantly different from

¹⁰To further explore the potential effects of public spending composition on GDPc, we also estimate a different version in which instead of considering the spending categories as a share of GDP, we use the spending categories as a share of the total spending. Results are summarized in Table A1 and Table A2 in the Appendix. The results are qualitatively similar to those reported here.

zero only for those LMAs located in areas with a level of economic development above the median level (Table 7, column 1), suggesting that an increase by one percentage point in total capital spending variable raises the growth rate by around 2%. No statistically significant effects are detected for LMAs below the median. Summarizing, in this vein local capital governments' expenditure have a negative and direct effect on growth when the area is more economically developed.

[Tables 7 and 8 around here]

We further explore the potential effects of public spending composition on GDPc using the spending categories as a share of GDP (Table 7, Columns 2-11; Table 8, Columns 2-11)¹¹. The negative total capital spending growth effects are confirmed in all regressions when the LMAs located in areas with a level of economic development above the median level are taken into account. The empirical evidence also shows that among the expenditure shares, Justice, Culture and Tourism exhibit positive and statistically significant effects on GDPc for LMAs located in areas with a level of economic development above the median level. More specifically, a 1 percentage point increase in Justice, Culture and Tourism share of GDP is associated, on average, with a higher level of GDPc of 0.5%, 2.5%, and 1.2% than the counterfactual of an unchanged Justice, Culture and Tourism share, respectively (Tables 7, Columns 3, 6 and 8).

6.2 Heterogeneity of LMAs depending on the level of expenditures

We examine whether the results depend on the distribution of the measure of total current expenditures—in other words, whether the main results are driven by LMAs characterized by high or low levels of spending. To do this, we repeat the analysis by separating the LMAs with a high level of expenditures (i.e. with total current spending above the median) and the LMAs with a low level of expenditures (i.e. with total current spending below the median). Results are summarized in Table 9 (Column 1) and in Table 10 (Column 1), respectively. The empirical evidence reveals that increasing total public current spending, financed by a change in the (omitted) budget surplus/deficit has an output effect that is negative and statistically significantly different from zero for those LMAs characterized both by high and low levels of spending. The point estimate suggests that an increase by one percentage point in total current spending variable decreases the growth rate by around 8% (Table 9, Column 1) and 9% (Table 10, Column 1), respectively. The evidence does not seem to be in line with the intuition of an “optimal” spending level; the marginal effect of spending is detrimental for growth if the expenditure is both higher and lower than this level (assuming that this level is around the median observed in the sample). The results also show that increasing total public capital spending,

¹¹We also consider the public expenditures composition as a share of the total current expenditures. Results are confirmed and showed in Table A3 and Table A4 in the Appendix.

financed by a change in the (omitted) budget surplus/deficit, has a negative but not statistically significant effect, both for those LMAs located in areas with a level of spending above and below the median level (Table 9, Column 1 and Table 10, Column 1). Summarizing, local current governments' expenditure may hamper growth both at a high and low level of spending.

[Tables 9 and 10 around here]

We further explore the potential effects of public spending composition on GDPc using the spending categories as a share of GDP (Table 9, Columns 2-11; Table 10, Columns 2-11)¹². The negative total current spending growth effects are confirmed in all regressions. Furthermore, the results show that also increasing in total public capital spending has a negative growth effect for areas with a level of spending above the median level but only slightly significant and much lower in size (Table 9, Columns 2-11). For the LMAs located in areas with a level of spending above the median level, the empirical evidence shows that almost all the expenditure shares exhibit not statistically significant effects on GDPc with the exception of the Justice and Tourism shares of GDP. Indeed, a 1 percentage point increase in Justice and Culture share of GDP is associated, on average, with a higher level of GDPc of 0.6% and 1.1% than the counterfactual of an unchanged Justice and Culture spending share, respectively (Table 9, Columns 3 and 8). When the LMAs located in areas with a level of spending below the median level, the empirical evidence shows that only the Tourism share exhibit positive and statistically significant effects on GDPc. More specifically, a 1 percentage point increase in Tourism share of GDP is associated, on average, with a higher level of GDPc of 1.3% than the counterfactual of an unchanged Tourism spending share, respectively (Table 10, Column 8).

6.3 Heterogeneity of LMAs depending on the geographical position

Finally, as Italy is a country characterized by an important north-south gap, we examine whether the results depend on the geographical location of the municipalities. To do this, we repeat the analysis by separating the LMAs located in the northern, central and southern regions. Results are summarized in Table 11 (Column 1), Table 12 (Column 1) and in Table 13 (Column 1), respectively. The empirical evidence reveals that increasing total public current spending, financed by a change in the (omitted) budget deficit has an output effect that is negative and statistically significantly different from zero for those LMAs located in all areas. The point estimate suggests that an increase by one percentage point in total current spending variable decreases the growth rate, on average among areas, by around 6.5% (Tables 11, 12 and 13, Column 1). Interestingly, the results show that increasing total public capital spending, financed by a change in the

¹²We also consider the public expenditures composition as a share of the total current expenditures. Results are confirmed and showed in Table A5 and Table A6 in the Appendix.

(omitted) budget surplus/deficit, has an output effect that is negative and statistically significantly different from zero, only for the LMAs located only in central and southern regions, suggesting that an increase by one percentage point in total capital spending variable decreases the growth rate by around 1.8% and 2%, respectively (Tables 12 and 13, Column 1). Jointly, the two findings can be somehow related to lower efficiency of public spending in central-southern regions (i.e., a lower ability of producing productivity-enhancing goods and services with the available resources), although some empirical evidence suggests quite the contrary (Lo Storto, 2016)¹³. This potential incoherence can be explained by that the expenditures in these areas – albeit efficient from a technical viewpoint – are not directed towards uses that maximize economic development. To sum up, local current and capital governments’ expenditures have a negative a direct effect on growth for municipalities located in the central and southern regions.

[Tables 11, 12 and 13 around here]

We finally explore the potential effects of public spending composition on GDPc using the spending categories as a share of GDP (Table 11, Columns 2-11; Table 12, Columns 2-11; Table 13, Columns 2-11)¹⁴. The negative total current spending growth effects are confirmed in all regressions when the LMAs located in all areas are considered. Results also confirm the negative total capital spending growth effects only for the LMAs located in the central-southern regions.

Only expenditure for Justice, Municipal Police and Culture has a positive and statistically significant effects on GDPc for LMAs located in the northern regions. More specifically, a 1 percentage point increase in the Justice, Municipal Police and Culture share of GDP is associated, on average, with a higher level of GDPc of 0.4%, 1.7% and 1.5% than the counterfactual of an unchanged Justice, Municipal Police and Culture spending share (Table 11, Columns 3, 4 and 6). As far as the LMAs located in the southern regions, the evidence shows also negative and statistically significant effects on GDPc when the expenditure share in Administration & Management and Roads & Transport is taken into account, probably underlining low efficiency of public spending in this specific category. Indeed, a 1 percentage point increase in the Administration & Management and Roads & Transport share of GDP is associated with a lower level of GDPc of 10% and 5.5% of Administration & Management and Roads & Transport spending share (Table 13, Columns 2 and 10).

¹³The results by (Lo Storto, 2016) indicate that municipalities in Southern Italy report a higher spending efficiency than those in the North. However, his analysis is concentrated only on major municipalities (100 out of 8,000) and covers a single year.

¹⁴We also consider the public expenditures composition as a share of the total current expenditures. Results are confirmed and showed in Table A7, Table A8 and Table A9 in Appendix.

7 Discussion, concluding remarks and lesson learned

Only few existing academic contributions investigate the effect of local spending on economic growth. This paper examines the nexus between public spending and economic growth at sub-regional level using a panel data of Italian Labor Market Areas (LMAs) for the period 2002-12. A matter of concern to empirical studies of economic development is the possibility that the explanatory variables are endogenous. In this paper, we face this challenge by employing an appropriate system-GMM estimator, controlling for the potential endogeneity of all explanatory fiscal variables by using their lagged instruments in the first-difference and level equations. To further elaborate the LMA budget constraint, we take into account in the empirical specification that total expenditures must be financed by revenues and/or the budget surplus/deficit (Kneller et al., 1999, Gemmel et al., 2011, 2016, Morozumi and Veiga, 2016). We interpret the coefficients on capital and current spending as capturing the effects of a rise in the respective spending financed by an equal rise in the deficit.

The general finding is a robust negative relationship between local current government expenditure and economic growth. Indeed, the results indicate that the government size significantly hampers economic growth having current spending a significantly strong negative impact on economic prosperity of areas. Investments in the capital budget have a lower (both in statistical significance and in size) detrimental effect on economic growth rates and, interestingly, in contrast to public spending from operating budgets there is no significant impact on economic growth when we control for the spending categories. These effects are heterogeneous, and depend on the characteristics of the LMAs. For instance, being located in areas characterized by low and high levels of spending is associated with negative growth effect of current spending, while being located in central-southern regions show negative growth effect of capital spending with respect to northern regions. Turning to the spending categories, the empirical evidence shows that only few of the expenditure shares (Justice, Tourism and Culture) exhibit a positive effect on GDPc. LMAs located in southern regions also show negative growth effect when spending dedicated to Administration & Management and Roads & Transportation is considered.

Several implications can be derived from the results obtained through our analysis.

First, we find a fairly robust negative relationship between local current government expenditure and economic growth. Having current spending a higher detrimental effect on economic growth rates than investment in capital budget which turns out to be not statistically significant when the public spending composition is taken into account. The results confirm the empirical evidence that the government size significantly retards economic growth when spending is used for payments in the operating budgets (Schaltegger and Torgler, 2006). These findings also underscore the importance of different incentives provided by different spending policies on economic growth, although the empirical results

offered thus far with regard to capital spending, at least at country level, are not consistent. For instance, Gupta et al. (2005) and Bose et al. (2007) show that capital spending enhances growth, whereas Devarajan et al. (1996) and Ghosh and Gregoriou (2008) argue that this spending has a growth-retarding effect. A possible explanation relies on the importance of having high quality institutions and accountable governments. Indeed, there are many studies indicating that institutional quality matters for economic growth. Public expenditures are expected to have more positive outcomes in areas with stronger institutions and governance, as wasteful spending and rent-seeking activities will be less prevalent. Public policies need to be accompanied by good governance, namely by a government that is accountable for its actions or a bureaucracy with a professional ethos (Rajkumar and Swaroop, 2008); this highlights the importance of the quality and efficiency of public (particularly capital) spending rather than its quantity (Pritchett, 2000, Dabla-Norris et al., 2012). The level of capital spending increases in the worsening of corruption and institutional quality, respectively (Keefer and Knack, 2007). Particularly when institutions prompt governments to be accountable to the general citizen does public capital spending promote growth (Morozumi and Veiga, 2016). All together, these findings suggest the existence of politically induced inefficiencies inherent in capital spending. An interesting extension of our analysis would be testing the effects of local public spending on growth taking into account the role played by the quality of public institutions and accountability.

Second, we find that total public current and capital spending have an output effect that is negative and statistically significantly different from zero in certain circumstances – that is to say the effects is somehow heterogenous. More specifically, LMAs located in central-southern regions show negative growth effect both of current and capital spending. The heterogenous growth effect of capital expenditures may be also explained taking into account the efficiency of public spending. Measuring efficiency is theoretically very distinct from the straight measurement of absolute spending. Indeed, it involves productivity considerations, with an assessment based on making the most of the available resources. Efficiency considers the rate at which municipalities are able to convert inputs (financial resources) into outputs (goods and services) rather than just being concerned with the absolute level of output produced. Some authors underlined the importance of measuring the efficiency of public spending providing evidence that what really matters to growth is not government size per se, but the size-efficiency mix (Angelopoulos et al., 2008). In this light, inefficiency can be considered as a mediating effect of other factors associated with the level of economic development or location in central-southern regions. If the LMAs belonging to these categories share structural factors that are related to the efficiency of spending (for example, managerial quality of their administrators), then the negative effect of the category variables on economic growth appears as through an inefficient use of the available public resources.

Third, a further contribution of this study is the emphasis on public spending allocation across several spending categories, following the literature on imbalances arising due to political incentive structures. The empirical evidence

shows that only few of the expenditure shares (Justice, Tourism and Culture) exhibit a positive effects on GDPc. A possible explanation is that there is a possible administrative-center effect leading to a higher spending contribution in justice, touristic and culture activities. Indeed, the LMAs may contain one or more province capital municipalities characterized by being usually the locations where the courthouses are build and with the most iconic touristic and cultural attractions. Moreover, LMAs located in southern regions also show negative growth effect when spending dedicated to Administration & Management and Roads & Transportation has been taken into account, again possibly linked to an inefficient use of resources and to the idea that insufficient market incentives may slow private sector investment-driven spending accumulation within the municipality. If the local governments' operations are less efficient in one area (for example, Road & Transportation) than another (for example, Justice), all else equal devoting more resources to the former than to the latter likely conduces to negative effects on growth. The case presented in this paper is one where the overall level of spending is negatively associated with economic growth, so the concentration of resources in a particularly inefficient area of spending may lead to the waste of overall resources, with harmful consequences on the economy. Importantly, the potential allocative inefficiency of the composition of fiscal expenditure can be viewed as rational from the perspective of the local government official and political competition for places in the upper levels of government hierarchy creating the conditions for some spending bias in local public spending.

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Tables

Table 1: LMAs characteristics by regions and territorial location

Regions (NUTS 2 level)	LMAs	Municipalities	Resident Population	Individual working in LMAs	Individual living and working in LMAs
Piemonte	37	1204	4,223,735	1,462,895	1,448,909
Valle d'Aosta	3	78	123,803	44,553	44,906
Lombardia	58	1,531	9,003,080	3,284,776	3,298,014
Trentino-Alto Adige	33	341	946,446	334,425	334,678
Veneto	34	581	4,502,412	1,613,435	1,609,156
Friuli-Venezia Giulia	11	217	1,196,720	411,966	412,921
Liguria	16	237	1,558,790	462,621	465,877
Emilia-Romagna	41	356	4,025,358	1,472,306	1,476,901
Toscana	53	290	3,512,420	1,174,511	1,172,133
Umbria	17	90	823,603	261,501	256,947
Marche	33	248	1,467,679	492,586	492,622
Lazio	25	381	5,115,887	1,547,496	1,554,765
Abruzzo	19	302	1,255,603	359,708	359,601
Molise	9	138	324,175	83,176	83,709
Campania	54	548	5,693,038	1,143,501	1,138,064
Puglia	44	254	4,016,240	896,000	890,954
Basilicata	19	128	588,476	142,598	148,761
Calabria	58	410	2,017,408	409,916	408,888
Sicilia	77	390	4,968,991	1,014,431	1,014,588
Sardegna	45	377	1,631,880	410,411	410,418
North-West	114	3,050	1.49e+07	5,254,845	5,257,706
North-East	119	1,495	1.07e+07	3,832,132	3,833,656
Centre	128	1,009	1.09e+07	3,476,094	3,476,467
South	203	1,780	1.39e+07	3,034,899	3,029,977
Island	122	767	6,600,871	1,424,842	1,425,006
Italy	686	8,101	5.70e+07	1.70e+07	1.70e+07

Source: Author's elaboration on ISTAT database

Table 2: Number of LMAs in the sample and in Italy by territorial location

Macro-areas of the country	LMAs covered in our sample 2002-2012	LMAs in Italy in 2002	LMAs in Italy in 2002-2012	Our coverage (%)
North-West	1254	114	1254	100%
North-East	1309	119	1309	100%
Centre	1397	128	1408	99%
South	3399	325	3575	96%
Italy	7359	686	7546	97.5%

Note: Author's elaboration on ISTAT database. South also contains islands.

Table 3: Descriptive statistics

Variables	Mean values			
	North	Centre	South	Whole Italy
GDP	3,036,510.00	2,253,863.00	1,019,938.00	1,938,029.00
GDPc	22,233.840	19,239.21	11,652.11	16,744.05
Current spending	4,655,512.87	7,844,696.38	4,739,010.29	5,748,746.12
Capital spending	2,435,773.80	3,518,724.11	2,543,522.59	2,643,260.43
Current spending/GDP	5.20	10.25	13.05	6.87
Capital spending/GDP	3.72	5.68	10.47	11.12
Revenue	8,224,887.84	13,735,222.55	8,864,355.07	73,058,613.26
Revenue/GDP	10.27	18.98	27.95	21.68
Administration Management	1,418,811.90	2,377,103.14	1,652,984.63	1,893,952.33
Justice	18,311.25	39,097.85	29,721.17	32,260.23
Municipal Police	214,213.27	402,329.47	306,494.16	314,046.55
Education	519,427.43	790,697.28	375,498.56	526,829.43
Culture	191,654.97	307,664.14	90,325.57	182,078.90
Economic Development	104,520.91	132,980.17	46,097.37	90,777.41
Tourism	62,362.33	69,851.41	31,900.91	56,796.58
Planning Environment	716,284.03	1,592,370.62	1,250,304.13	1,196,353.48
Roads Transport	402,562.30	732,500.08	377,548.39	474,002.80
Social Welfare	798,083.81	1,113,756.82	489,586.55	805,399.49
Administration Management/GDP	1.75	3.31	5.00	4.18
Justice/GDP	0.01	0.02	0.04	0.03
Municipal Police/GDP	0.19	0.48	0.79	0.57
Education/GDP	0.48	0.98	1.05	0.90
Culture/GDP	0.15	0.36	0.23	0.28
Economic Development/GDP	0.13	0.17	0.11	0.15
Tourism/GDP	0.14	0.14	0.10	0.15
Planning Environment/GDP	0.94	2.21	3.25	2.40
Roads Transport/GDP	0.51	0.91	1.16	0.91
Social Welfare/GDP	0.61	1.25	1.10	1.24
Administration Management/Current Spending	0.34	0.32	0.38	0.36
Justice/Current Spending	0.00	0.00	0.00	0.00
Municipal Police/Current Spending	0.04	0.05	0.06	0.05
Education/Current Spending	0.10	0.10	0.08	0.09
Culture/Current Spending	0.03	0.04	0.02	0.03
Economic Development/Current Spending	0.02	0.02	0.01	0.02
Tourism/Current Spending	0.01	0.01	0.01	0.01
Planning Environment/Current Spending	0.17	0.20	0.25	0.20
Roads Transport/Current Spending	0.09	0.09	0.09	0.09
Social Welfare/Current Spending	0.14	0.13	0.08	0.12
Average income per capita	12,119.90	10,470.63	6,644.43	9,263.88
Share of children	0.04	0.04	0.04	0.04
Share of elderly	0.22	0.24	0.22	0.23
Population density	194.91	161.57	228.92	192.11
Labour growth	0.00	0.01	-0.01	0.00

Note: Authors' elaboration from AIDA PA and ISTAT database.

Table 4: Public expenditure and GDP growth – System GMM estimation

Dependent variable: GDPc at SSL level	(1)	(2)
GDPc, t-1	0.725*** (0.0503)	0.733*** (0.0409)
Total spending/GDP	-0.0186 (0.173)	
Current spending/GDP		-0.0718** (0.0304)
Capital spending/GDP		-0.0136* (0.00762)
Revenue/GDP	-0.0147 (0.171)	0.0436 (0.0312)
Average income per capita	0.181*** (0.0416)	0.159*** (0.0378)
Share of children	1.111* (0.567)	0.526 (0.464)
Share of elderly	-0.142 (0.103)	-0.250** (0.105)
Population density	-0.00002* (0.00001)	-0.00001* (0.000008)
Labour growth	0.377** (0.150)	0.312*** (0.117)
AB(2)	No reject H0	No reject H0
Sargan	No reject H0	No reject H0
Period	2002-2012	2002-2012
No of obs.	6690	6690

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01

Table 5: Public expenditure and GDP growth – System GMM estimation – Expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)
GDPc, t-1	0.722*** (0.0398)	0.738*** (0.0400)	0.721*** (0.0410)	0.720*** (0.0443)	0.733*** (0.0414)
Current spending/GDP	-0.0731* (0.0420)	-0.0714** (0.0305)	-0.0587** (0.0276)	-0.0590 (0.0363)	-0.0991*** (0.0353)
Capital spending/GDP	-0.0117 (0.00755)	-0.0131* (0.00758)	-0.00869 (0.00817)	-0.0113 (0.00770)	-0.0158* (0.00841)
Revenue/GDP	0.0382 (0.0301)	0.0414 (0.0309)	0.0209 (0.0306)	0.0328 (0.0320)	0.0506 (0.0315)
Average income per capita	0.190*** (0.0370)	0.158*** (0.0381)	0.182*** (0.0373)	0.193*** (0.0398)	0.143*** (0.0397)
Share of children	0.503 (0.453)	0.496 (0.453)	0.591 (0.496)	0.425 (0.484)	0.0992 (0.479)
Share of elderly	-0.300*** (0.0983)	-0.252** (0.103)	-0.277*** (0.104)	-0.298*** (0.103)	-0.243** (0.114)
Population density	-0.000009 (0.000007)	-0.00001 (0.000007)	-0.00001 (0.000009)	-0.00001 (0.000008)	-0.000004 (0.000007)
Labour growth	0.292** (0.117)	0.337*** (0.117)	0.299** (0.121)	0.283** (0.120)	0.332*** (0.122)
Administration & Management/GDP	0.0150 (0.0285)				
Justice/GDP		0.00407** (0.00185)			
Municipal Police/GDP			0.0150 (0.0144)		
Education/GDP				0.00736 (0.0180)	
Culture/GDP					0.0284** (0.0117)
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	6690	6690	6690	6690	6690

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6: Public expenditure and GDP growth – System GMM estimation – Expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)
GDPc, t-1	0.729*** (0.0429)	0.732*** (0.0428)	0.731*** (0.0431)	0.715*** (0.0427)	0.736*** (0.0415)
Current spending/GDP	-0.0491* (0.0296)	-0.0717** (0.0326)	-0.0929** (0.0383)	-0.0493 (0.0405)	-0.0725** (0.0311)
Capital spending/GDP	-0.0129 (0.00782)	-0.0128 (0.00815)	-0.0134 (0.00827)	-0.0121 (0.00779)	-0.0110 (0.00823)
Revenue/GDP	0.0290 (0.0309)	0.0254 (0.0327)	0.0391 (0.0357)	0.0349 (0.0309)	0.0329 (0.0315)
Average income per capita	0.177*** (0.0403)	0.150*** (0.0390)	0.144*** (0.0358)	0.193*** (0.0383)	0.157*** (0.0381)
Share of children	0.220 (0.466)	0.638 (0.498)	1.210** (0.506)	0.381 (0.471)	0.367 (0.466)
Share of elderly	-0.301*** (0.102)	-0.274*** (0.104)	-0.131 (0.0973)	-0.319*** (0.101)	-0.278*** (0.103)
Population density	-0.000004 (0.000007)	-0.000009 (0.000007)	-0.00001 (0.000008)	-0.000008 (0.000007)	-0.00001* (0.000008)
Labour growth	0.299** (0.122)	0.370*** (0.110)	0.235 (0.148)	0.281** (0.121)	0.302** (0.120)
Economic Development/GDP	0.0072 (0.0074)				
Tourism/GDP		0.0145*** (0.0055)			
Planning & Environment/GDP			0.0320* (0.0171)		
Roads & Transport/GDP				-0.0031 (0.0220)	
Social Welfare/GDP					0.0164 (0.0108)
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	6690	6690	6690	6690	6690

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01

Table 7: Public expenditure and GDP growth – System GMM estimation – LMA with a GDP level above the median – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0148 (0.0295)	-0.0284 (0.0348)	-0.0139 (0.0298)	-0.0213 (0.0323)	-0.0184 (0.0344)	-0.0320 (0.0327)	0.00483 (0.0294)	-0.0304 (0.0303)	-0.0114 (0.0309)	-0.0197 (0.0380)	-0.0204 (0.0305)
Capital spending/GDP	-0.0200*** (0.00726)	-0.0166** (0.00739)	-0.0179** (0.00703)	-0.0143* (0.00729)	-0.0170** (0.00712)	-0.0192** (0.00812)	-0.0161** (0.00721)	-0.0223*** (0.00755)	-0.0189** (0.00842)	-0.0170** (0.00715)	-0.0174** (0.00740)
Administration & Management/GDP		0.0321 (0.0240)									
Justice/GDP			0.0045** (0.0021)								
Municipal Police/GDP				0.0245 (0.0185)							
Education/GDP					0.0177 (0.0158)						
Culture/GDP						0.0246** (0.0110)					
Economic Development/GDP							0.0022 (0.0098)				
Tourism/GDP								0.0118** (0.0052)			
Planning & Environment/GDP									0.0112 (0.0160)		
Roads & Transport/GDP										0.0190 (0.0182)	
Social Welfare/GDP											0.0158 (0.0105)
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	3426	3426	3426	3426	3426	3426	3426	3426	3426	3426	3426

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of elderly, Population density and Labour growth.

Table 8: Public expenditure and GDP growth – System GMM estimation – LMA with a GDP level below the median – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.00609 (0.0413)	-0.0253 (0.0452)	-0.0116 (0.0406)	-0.0184 (0.0372)	-0.00419 (0.0431)	-0.0159 (0.0408)	0.00167 (0.0398)	-0.0158 (0.0373)	-0.0498 (0.0511)	-0.00315 (0.0483)	-0.0217 (0.0394)
Capital spending/GDP	0.00964 (0.0132)	0.0101 (0.0134)	0.00877 (0.0132)	0.0130 (0.0147)	0.00956 (0.0134)	0.00943 (0.0131)	0.0102 (0.0129)	0.0105 (0.0132)	0.00666 (0.0130)	0.00940 (0.0135)	0.00888 (0.0133)
Administration & Management/GDP		0.0116 (0.0258)									
Justice/GDP			-0.000001 (0.0018)								
Municipal Police/GDP				0.0078 (0.0128)							
Education/GDP					-0.0075 (0.0189)						
Culture/GDP						0.0068 (0.0099)					
Economic Development/GDP							0.0004 (0.0095)				
Tourism/GDP								0.0074 (0.0054)			
Planning & Environment/GDP									0.0189 (0.0205)		
Roads & Transport/GDP										-0.0098 (0.0209)	
Social Welfare/GDP											0.0016 (0.0107)
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	3264	3264	3264	3264	3264	3264	3264	3264	3264	3264	3264

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of children, Share of elderly, Population density and Labour growth.

Table 9: Public expenditure and GDP growth – System GMM estimation – LMA with a current spending level above the median – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0701*** (0.0266)	-0.0540* (0.0312)	-0.0797*** (0.0278)	-0.0314 (0.0292)	-0.0319 (0.0345)	-0.0716** (0.0296)	-0.0579** (0.0254)	-0.0855*** (0.0285)	-0.0665** (0.0334)	-0.0339 (0.0327)	-0.0889*** (0.0285)
Capital spending/GDP	-0.0141 (0.00880)	-0.0159* (0.00837)	-0.0148* (0.00855)	-0.0199* (0.0112)	-0.0149* (0.00882)	-0.0152* (0.00843)	-0.0177* (0.00904)	-0.0178* (0.00909)	-0.0157* (0.00873)	-0.0154* (0.00874)	-0.0109 (0.00771)
Administration & Management/GDP		-0.0127 (0.0250)									
Justice/GDP			0.0056** (0.0023)								
Municipal Police/GDP				-0.0303 (0.0239)							
Education/GDP					-0.0241 (0.0230)						
Culture/GDP						0.0118 (0.0126)					
Economic Development/GDP							-0.0001 (0.0098)				
Tourism/GDP								0.0109** (0.0054)			
Planning & Environment/GDP									0.0088 (0.0158)		
Roads & Transport/GDP										-0.0231 (0.0208)	
Social Welfare/GDP											0.0275* (0.0142)
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	3426	3426	3426	3426	3426	3426	3426	3426	3426	3426	3426

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of children, Share of elderly, Population density and Labour growth.

Table 10: Public expenditure and GDP growth – System GMM estimation – LMA with a current spending level below the median – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0938*** (0.0371)	-0.0768*** (0.0388)	-0.0845*** (0.0333)	-0.0664*** (0.0316)	-0.0636*** (0.0317)	-0.0532 (0.0349)	-0.0923*** (0.0399)	-0.0824*** (0.0341)	-0.0813*** (0.0402)	-0.0588 (0.0366)	-0.0727*** (0.0320)
Capital spending/GDP	-0.0201 (0.0140)	-0.0143 (0.0134)	-0.0163 (0.0133)	-0.0156 (0.0147)	-0.0152 (0.0139)	-0.0124 (0.0131)	-0.0134 (0.0139)	-0.0130 (0.0143)	-0.0125 (0.0163)	-0.0154 (0.0134)	-0.0160 (0.0135)
Administration & Management/GDP		0.0121 (0.0199)									
Justice/GDP			0.0032 (0.0022)								
Municipal Police/GDP				0.0020 (0.0139)							
Education/GDP					0.0016 (0.0150)						
Culture/GDP						0.0026 (0.0085)					
Economic Development/GDP							0.0200* (0.0108)				
Tourism/GDP								0.0132*** (0.0052)			
Planning & Environment/GDP									0.0155 (0.0217)		
Roads & Transport/GDP										-0.0001 (0.0161)	
Social Welfare/GDP											0.0037 (0.0100)
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	3264	3264	3264	3264	3264	3264	3264	3264	3264	3264	3264

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of children, Share of elderly, Population density and Labour growth.

Table 11: Public expenditure and GDP growth – System GMM estimation – LMA located in the Northern regions – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0789** (0.0381)	-0.0580* (0.0304)	-0.0757** (0.0369)	-0.0540* (0.0279)	-0.0600* (0.0310)	-0.0636* (0.0327)	-0.0579* (0.0333)	-0.0674* (0.0364)	-0.0685** (0.0345)	-0.0520* (0.0301)	-0.0506* (0.0284)
Capital spending/GDP	0.00237 (0.0171)	-0.00782 (0.0121)	-0.00704 (0.0150)	-0.000824 (0.0134)	-0.00500 (0.0124)	-0.00897 (0.0120)	-0.00750 (0.0120)	-0.01113 (0.0129)	-0.0156 (0.0117)	-0.00871 (0.0121)	-0.00416 (0.0134)
Administration & Management/GDP		0.0107 (0.0121)									
Justice/GDP			0.0044** (0.0021)								
Municipal Police/GDP				0.0178** (0.0089)							
Education/GDP					0.0125 (0.0112)						
Culture/GDP						0.0142* (0.0083)					
Economic Development/GDP							0.0117 (0.0097)				
Tourism/GDP								0.0099 (0.0062)			
Planning & Environment/GDP									0.0081 (0.0081)		
Roads & Transport/GDP										0.0043 (0.0111)	
Social Welfare/GDP											0.0080 (0.0065)
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	2340	2340	2340	2340	2340	2340	2340	2340	2340	2340	2340

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of elderly, Population density and Labour growth.

Table 12: Public expenditure and GDP growth – System GMM estimation – LMA located in the Central regions – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0530** (0.0225)	-0.0247 (0.0401)	-0.0557** (0.0228)	-0.0311 (0.0220)	-0.0599** (0.0291)	-0.0486** (0.0221)	-0.0418* (0.0214)	-0.0742*** (0.0252)	-0.0746** (0.0368)	-0.0787*** (0.0238)	-0.0458 (0.0296)
Capital spending/GDP	-0.0183** (0.00790)	-0.0175** (0.00715)	-0.0189** (0.00769)	-0.0188** (0.00731)	-0.0186** (0.00731)	-0.0161** (0.00762)	-0.0186*** (0.00691)	-0.0176** (0.00805)	-0.0159* (0.00872)	-0.0160** (0.00729)	-0.0177** (0.00725)
Administration & Management/GDP		-0.0263 (0.0380)									
Justice/GDP			0.00105 (0.00135)								
Municipal Police/GDP				-0.0228 (0.0171)							
Education/GDP					0.00659 (0.0137)						
Culture/GDP						0.00496 (0.00852)					
Economic Development/GDP							-0.000982 (0.00871)				
Tourism/GDP								0.00966** (0.00474)			
Planning & Environment/GDP									0.00156 (0.0154)		
Roads & Transport/GDP										0.0225 (0.0145)	
Social Welfare/GDP											0.000428 (0.0128)
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of elderly, Population density and Labour growth.

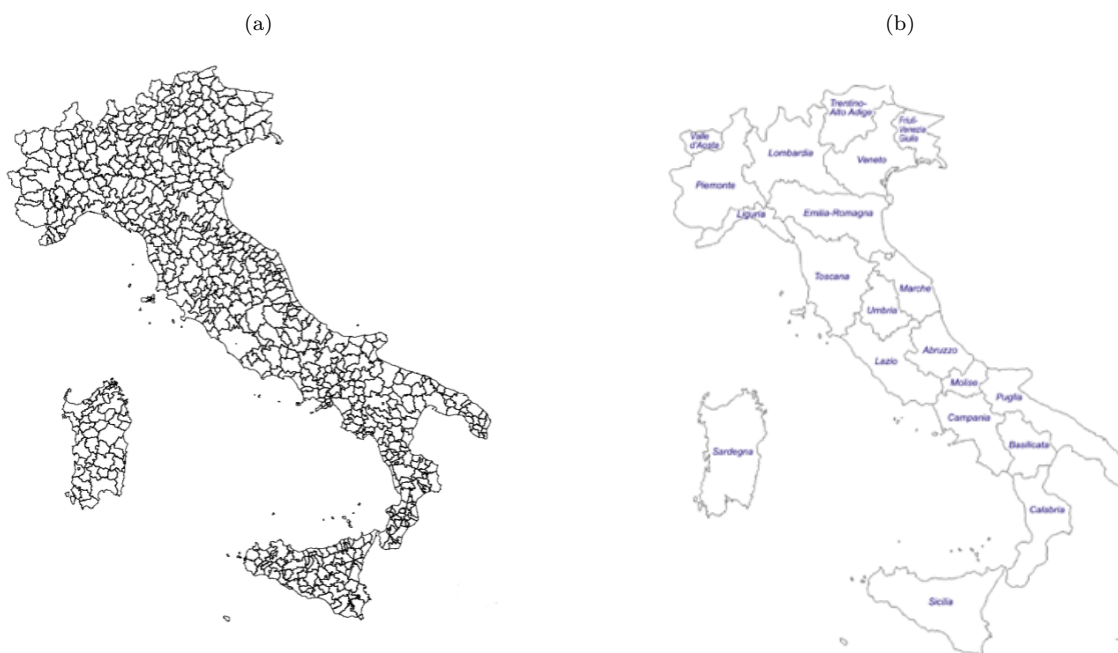
Table 13: Public expenditure and GDP growth – System GMM estimation – LMA located in the Southern regions – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0552* (0.0307)	0.0617 (0.0664)	-0.0465 (0.0327)	-0.0546 (0.0371)	-0.0393 (0.0364)	-0.0991*** (0.0371)	-0.0487 (0.0297)	-0.0602* (0.0314)	-0.0706* (0.0365)	0.00129 (0.0399)	-0.0738** (0.0349)
Capital spending/GDP	-0.0199* (0.0113)	-0.0226** (0.0108)	-0.0176 (0.0110)	-0.0195* (0.0114)	-0.0182* (0.0106)	-0.0208* (0.0115)	-0.0185* (0.0106)	-0.0187* (0.0111)	-0.0217** (0.0108)	-0.0162 (0.0117)	-0.0210* (0.0113)
Administration & Management/GDP		-0.109** (0.0490)									
Justice/GDP			-0.000568 (0.00304)								
Municipal Police/GDP				0.00152 (0.0229)							
Education/GDP					-0.0224 (0.0264)						
Culture/GDP						0.0190 (0.0125)					
Economic Development/GDP							-0.00341 (0.00741)				
Tourism/GDP								0.00315 (0.00409)			
Planning & Environment/GDP									0.0132 (0.0205)		
Roads & Transport/GDP										-0.0528** (0.0238)	
Social Welfare/GDP											0.0119 (0.0110)
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	3080	3080	3080	3080	3080	3080	3080	3080	3080	3080	3080

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of children, Share of elderly, Population density and Labour growth.

Figures

Figure 1: Territorial location of LMAs and regions in Italy – Year 2011



Note: Authors' elaboration from ISTAT database.

On line Appendix: Tables and Figures

Table A1: Public expenditure and GDP growth – System GMM estimation – Expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)
GDPc, t-1	0.738*** [0.0407]	0.737*** [0.0402]	0.733*** [0.0410]	0.724*** [0.0410]	0.738*** [0.0404]
Current spending/GDP	-0.0651** [0.031]	-0.0719** [0.0305]	-0.0734** [0.0305]	-0.0769** [0.0314]	-0.0781** [0.0314]
Capital spending/GDP	-0.0150* [0.0080]	-0.0136* [0.0076]	-0.0143* [0.0076]	-0.0134* [0.0076]	-0.0159** [0.0079]
Revenue/GDP	0.0416 [0.0323]	0.0439 [0.0312]	0.0461 [0.0310]	0.0435 [0.0312]	0.0506 [0.0319]
Average income per capita	0.152*** [0.0401]	0.157*** [0.0379]	0.160*** [0.0379]	0.162*** [0.0374]	0.140*** [0.0379]
Share of children	0.527 [0.456]	0.539 [0.460]	0.516 [0.464]	0.713 [0.511]	0.339 [0.495]
Share of elderly	-0.212** [0.103]	-0.248** [0.104]	-0.254** [0.104]	-0.250** [0.109]	-0.230** [0.110]
Population density	-0.00001** [0.000008]	-0.00001* [0.000008]	-0.00001* [0.000008]	-0.00002** [0.000009]	-0.00001 [0.000009]
Labour growth	0.332*** [0.119]	0.332*** [0.116]	0.304*** [0.117]	0.303*** [0.116]	0.329*** [0.118]
Administration & Management/Current spending	-0.0628*** [0.0191]				
Justice/Current spending		0.0022** [0.0011]			
Municipal Police/Current spending			-0.0040 [0.0050]		
Education/Current spending				-0.0150 [0.0103]	
Culture/Current spending					0.0127*** [0.0047]
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	6690	6690	6690	6690	6690

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01

Table A2: Public expenditure and GDP growth – System GMM estimation – Expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)
GDPc, t-1	0.757*** [0.0391]	0.737*** [0.0420]	0.737*** [0.0447]	0.730*** [0.0410]	0.731*** [0.0407]
Current spending/GDP	-0.0646** [0.0327]	-0.0609* [0.0322]	-0.0701** [0.0329]	-0.0767*** [0.0295]	-0.0736** [0.0296]
Capital spending/GDP	-0.0122 [0.0075]	-0.0131 [0.0079]	-0.0138 [0.0085]	-0.0127 [0.0077]	-0.0136* [0.0075]
Revenue/GDP	0.0358 [0.0324]	0.0321 [0.0329]	0.0498 [0.0364]	0.0462 [0.0304]	0.0452 [0.0304]
Average income per capita	0.135*** [0.0366]	0.153*** [0.0394]	0.149*** [0.0416]	0.160*** [0.0374]	0.163*** [0.0383]
Share of children	0.403 [0.469]	0.591 [0.473]	0.870** [0.442]	0.500 [0.472]	0.539 [0.470]
Share of elderly	-0.208** [0.103]	-0.257** [0.103]	-0.191** [0.0972]	-0.255** [0.108]	-0.252** [0.105]
Population density	-0.00001 [0.000009]	-0.00001 [0.000008]	-0.00001 [0.000008]	-0.00001* [0.000008]	-0.00001* [0.000008]
Labour growth	0.359*** [0.115]	0.355*** [0.110]	0.196 [0.149]	0.310*** [0.117]	0.315*** [0.116]
Economic Development/Current spending	0.0094** [0.0047]				
Tourism/Current spending		0.00812*** [0.0025]			
Planning & Environment/Current spending			-0.0009 [0.0054]		
Roads & Transport/Current spending				-0.0038 [0.0074]	
Social Welfare/Current spending					-0.0037 [0.0050]
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	6690	6690	6690	6690	6690

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01

Table A3: Public expenditure and GDP growth – System GMM estimation – LMA with a GDP level above the median – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0148 [0.0295]	-0.0209 [0.0281]	-0.0180 [0.0298]	-0.0206 [0.0293]	-0.0153 [0.0296]	-0.0162 [0.0292]	-0.0155 [0.0295]	-0.0185 [0.0299]	-0.0114 [0.0339]	-0.0134 [0.0292]	-0.0190 [0.0289]
Capital spending/GDP	-0.0200*** [0.0072]	-0.0208*** [0.0076]	-0.0194*** [0.0071]	-0.0198*** [0.0073]	-0.0196*** [0.0073]	-0.0198*** [0.0076]	-0.0201*** [0.0074]	-0.0215*** [0.0075]	-0.0197** [0.0088]	-0.0195*** [0.0073]	-0.0191*** [0.0073]
Administration & Management/Current spending		-0.0299** [0.0148]									
Justice/Current spending			0.0025* [0.0015]								
Municipal Police/Current spending				-0.0059 [0.0049]							
Education/Current spending					-0.0063 [0.0069]						
Culture/Current spending						0.0149** [0.0062]					
Economic Development/Current spending							0.0092* [0.0050]				
Tourism/Current spending								0.0038 [0.0026]			
Planning & Environment/Current spending									-0.0150** [0.0065]		
Roads & Transport/Current spending										0.0001 [0.0070]	
Social Welfare/Current spending											0.0055 [0.0066]
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of elderly, Population density and Labour growth.

Table A4: Public expenditure and GDP growth – System GMM estimation – LMA with a GDP level below the median – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0060 [0.0413]	-0.0132 [0.0409]	-0.0070 [0.0410]	-0.0023 [0.0432]	-0.0109 [0.0407]	-0.0098 [0.0426]	-0.0054 [0.0428]	-0.0011 [0.0397]	-0.0163 [0.0457]	-0.0132 [0.0390]	-0.0066 [0.0395]
Capital spending/GDP	0.0096 [0.0132]	0.0072 [0.0131]	0.0092 [0.0132]	0.0121 [0.0136]	0.0098 [0.0133]	0.0093 [0.0137]	0.0082 [0.0129]	0.0095 [0.0132]	0.0111 [0.0131]	0.0099 [0.0134]	0.0097 [0.0130]
Administration & Management/Current spending		-0.0346 [0.0213]									
Justice/Current spending			-0.0003 [0.0010]								
Municipal Police/Current spending				0.0050 [0.0062]							
Education/Current spending					-0.0003 [0.0093]						
Culture/Current spending						0.0104* [0.0053]					
Economic Development/Current spending							0.0134*** [0.0047]				
Tourism/Current spending								0.0044* [0.0026]			
Planning & Environment/Current spending									0.0010 [0.0071]		
Roads & Transport/Current spending										-0.0027 [0.0099]	
Social Welfare/Current spending											-0.0034 [0.0053]
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	3264	3264	3264	3264	3264	3264	3264	3264	3264	3264	3264

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of children, Share of elderly, Population density and Labour growth.

Table A5: Public expenditure and GDP growth – System GMM estimation – LMA with a current spending level above the median – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0701*** [0.0266]	-0.0758*** [0.0283]	-0.0729*** [0.0272]	-0.0687** [0.0267]	-0.0727*** [0.0275]	-0.0731*** [0.0273]	-0.0717*** [0.0269]	-0.0747*** [0.0267]	-0.0550* [0.0308]	-0.0734*** [0.0271]	-0.0724*** [0.0272]
Capital spending/GDP	-0.0141 [0.0088]	-0.0171** [0.0084]	-0.0149* [0.0089]	-0.0148 [0.0090]	-0.0133 [0.0088]	-0.0144 [0.0089]	-0.0154* [0.0091]	-0.0163* [0.0090]	-0.0149 [0.0094]	-0.0145* [0.0087]	-0.0150* [0.0088]
Administration & Management/Current spending		-0.0485** [0.0214]									
Justice/Current spending			0.0021* [0.0011]								
Municipal Police/Current spending				-0.0011 [0.0074]							
Education/Current spending					-0.0120 [0.0113]						
Culture/Current spending						0.0073 [0.0050]					
Economic Development/Current spending							0.0060 [0.0038]				
Tourism/Current spending								0.0056** [0.0026]			
Planning & Environment/Current spending									0.0051 [0.0059]		
Roads & Transport/Current spending										0.0008 [0.0073]	
Social Welfare/Current spending											-0.0047 [0.0061]
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	3426	3426	3426	3426	3426	3426	3426	3426	3426	3426	3426

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of elderly, Population density and Labour growth.

Table A6: Public expenditure and GDP growth – System GMM estimation – LMA with a current spending level below the median – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0938** [0.0371]	-0.0868** [0.0354]	-0.0874** [0.0346]	-0.0972*** [0.0373]	-0.0967** [0.0375]	-0.0931** [0.0361]	-0.0940** [0.0373]	-0.0860** [0.0376]	-0.0821** [0.0372]	-0.0946*** [0.0358]	-0.0966*** [0.0373]
Capital spending/GDP	-0.0201 [0.0140]	-0.0217 [0.0138]	-0.0177 [0.0134]	-0.0213 [0.0141]	-0.0218 [0.0143]	-0.0197 [0.0140]	-0.0186 [0.0139]	-0.0171 [0.0148]	-0.0213 [0.0151]	-0.0201 [0.0141]	-0.0210 [0.0139]
Administration & Management/Current spending		-0.0208 [0.0157]									
Justice/Current spending			0.0018 [0.0013]								
Municipal Police/Current spending				-0.0039 [0.0028]							
Education/Current spending					-0.0076 [0.0082]						
Culture/Current spending						0.0069* [0.0041]					
Economic Development/Current spending							0.0094* [0.0055]				
Tourism/Current spending								0.0052** [0.0023]			
Planning & Environment/Current spending									-0.0006 [0.0068]		
Roads & Transport/Current spending										0.0003 [0.0080]	
Social Welfare/Current spending											-0.0061 [0.0050]
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	3264	3264	3264	3264	3264	3264	3264	3264	3264	3264	3264

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of elderly, Population density and Labour growth.

Table A7: Public expenditure and GDP growth – System GMM estimation – LMA located in the Northern regions – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0789** [0.0381]	-0.0860** [0.0393]	-0.0745** [0.0369]	-0.0781** [0.0348]	-0.0817** [0.0390]	-0.0761** [0.0359]	-0.0710* [0.0379]	-0.0704* [0.0371]	-0.0846** [0.0343]	-0.0776** [0.0374]	-0.0764** [0.0360]
Capital spending/GDP	0.0023 [0.0171]	0.0023 [0.0161]	-0.0057 [0.0154]	0.0027 [0.0168]	0.0005 [0.0170]	0.0022 [0.0176]	0.0049 [0.0172]	-0.0036 [0.0152]	-0.0127 [0.0136]	0.0035 [0.0170]	0.0004 [0.0172]
Administration & Management/Current spending		-0.0266 [0.0176]									
Justice/Current spending			0.0032** [0.0014]								
Municipal Police/Current spending				0.0012 [0.0043]							
Education/Current spending					-0.0110 [0.0086]						
Culture/Current spending						0.0103* [0.0058]					
Economic Development/Current spending							0.0057 [0.0057]				
Tourism/Current spending								0.0074* [0.0042]			
Planning & Environment/Current spending									0.0010 [0.0046]		
Roads & Transport/Current spending										0.0001 [0.0067]	
Social Welfare/Current spending											-0.0051 [0.0047]
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	2340	2340	2340	2340	2340	2340	2340	2340	2340	2340	2340

Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of children, Share of elderly, Population density and Labour growth.

Table A8: Public expenditure and GDP growth – System GMM estimation – LMA located in the Central regions – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0530** [0.0225]	-0.0619** [0.0248]	-0.0612*** [0.0228]	-0.0603*** [0.0221]	-0.0605*** [0.0228]	-0.0499** [0.0218]	-0.0538** [0.0230]	-0.0583** [0.0241]	-0.0630** [0.0251]	-0.0472** [0.0217]	-0.0512** [0.0232]
Capital spending/GDP	-0.0183** [0.00790]	-0.0193*** [0.00727]	-0.0186** [0.00745]	-0.0176** [0.00759]	-0.0192** [0.00771]	-0.0152* [0.00769]	-0.0192** [0.00767]	-0.0191** [0.00790]	-0.0143 [0.00933]	-0.0166** [0.00750]	-0.0194*** [0.00739]
Administration & Management/Current spending		-0.0287 [0.0183]									
Justice/Current spending			-0.00133 [0.000841]								
Municipal Police/Current spending				-0.00689 [0.00682]							
Education/Current spending					0.00698 [0.00857]						
Culture/Current spending						0.0148** [0.00688]					
Economic Development/Current spending							0.00959* [0.00569]				
Tourism/Current spending								0.00192 [0.00312]			
Planning & Environment/Current spending									-0.00959 [0.00665]		
Roads & Transport/Current spending										-0.00547 [0.00796]	
Social Welfare/Current spending											0.00461 [0.00595]
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270

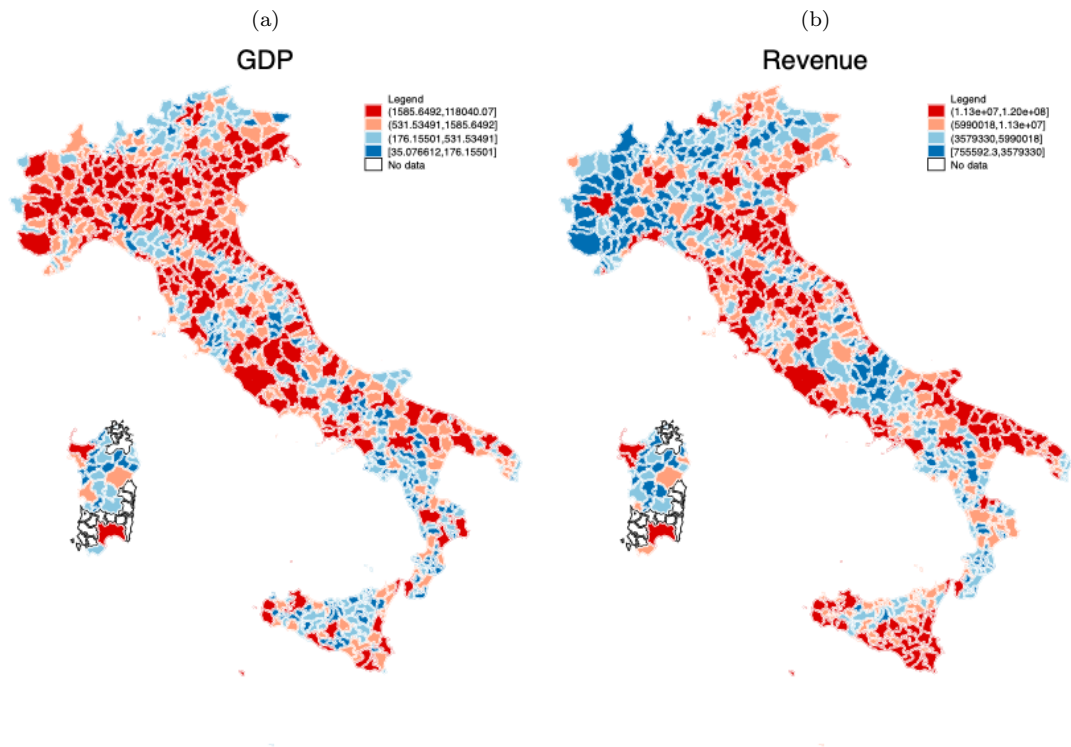
Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of elderly, Population density and Labour growth.

Table A9: Public expenditure and GDP growth – System GMM estimation – LMA located in the Southern regions – Total expenditure and expenditure composition

Dependent variable: GDPc at LMA level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Current spending/GDP	-0.0552* [0.0307]	-0.0572* [0.0322]	-0.0525* [0.0317]	-0.0532* [0.0312]	-0.0629* [0.0337]	-0.0647** [0.0314]	-0.0523 [0.0324]	-0.0537* [0.0314]	-0.0468 [0.0331]	-0.0669** [0.0298]	-0.0590* [0.0311]
Capital spending/GDP	-0.0199* [0.0113]	-0.0241** [0.0108]	-0.0180 [0.0112]	-0.0189* [0.0114]	-0.0214* [0.0112]	-0.0201* [0.0113]	-0.0209* [0.0116]	-0.0173 [0.0112]	-0.0216* [0.0112]	-0.0195* [0.0115]	-0.0204* [0.0111]
Administration & Management/Current spending		-0.0833*** [0.0287]									
Justice/Current spending			0.000266 [0.00168]								
Municipal Police/Current spending				0.00144 [0.0127]							
Education/Current spending					-0.000790 [0.0152]						
Culture/Current spending						0.00602 [0.00625]					
Economic Development/Current spending							0.00240 [0.00541]				
Tourism/Current spending								0.00320 [0.00256]			
Planning & Environment/Current spending									0.0142 [0.0114]		
Roads & Transport/Current spending										-0.0116 [0.0109]	
Social Welfare/Current spending											0.00584 [0.00685]
AB(2)	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Sargan	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0	No reject H0
Period	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012	2002-2012
No of obs.	3080	3080	3080	3080	3080	3080	3080	3080	3080	3080	3080

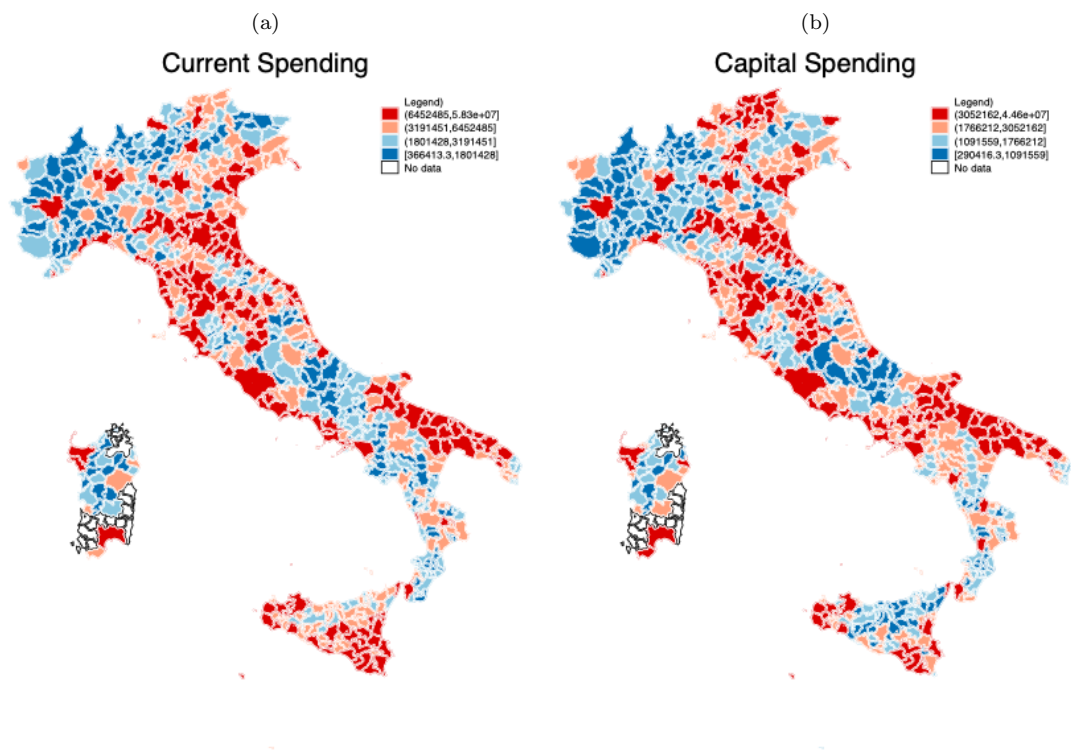
Standard errors in brackets; * p < 0.10, ** p < 0.05, *** p < 0.01. All regressions include as controls GDPc, t-1, Revenue/GDP, Average income per capita, Share of elderly, Population density and Labour growth.

Figure A1: Graphical representation of the financial data at LMA level - Gross domestic product and Revenue



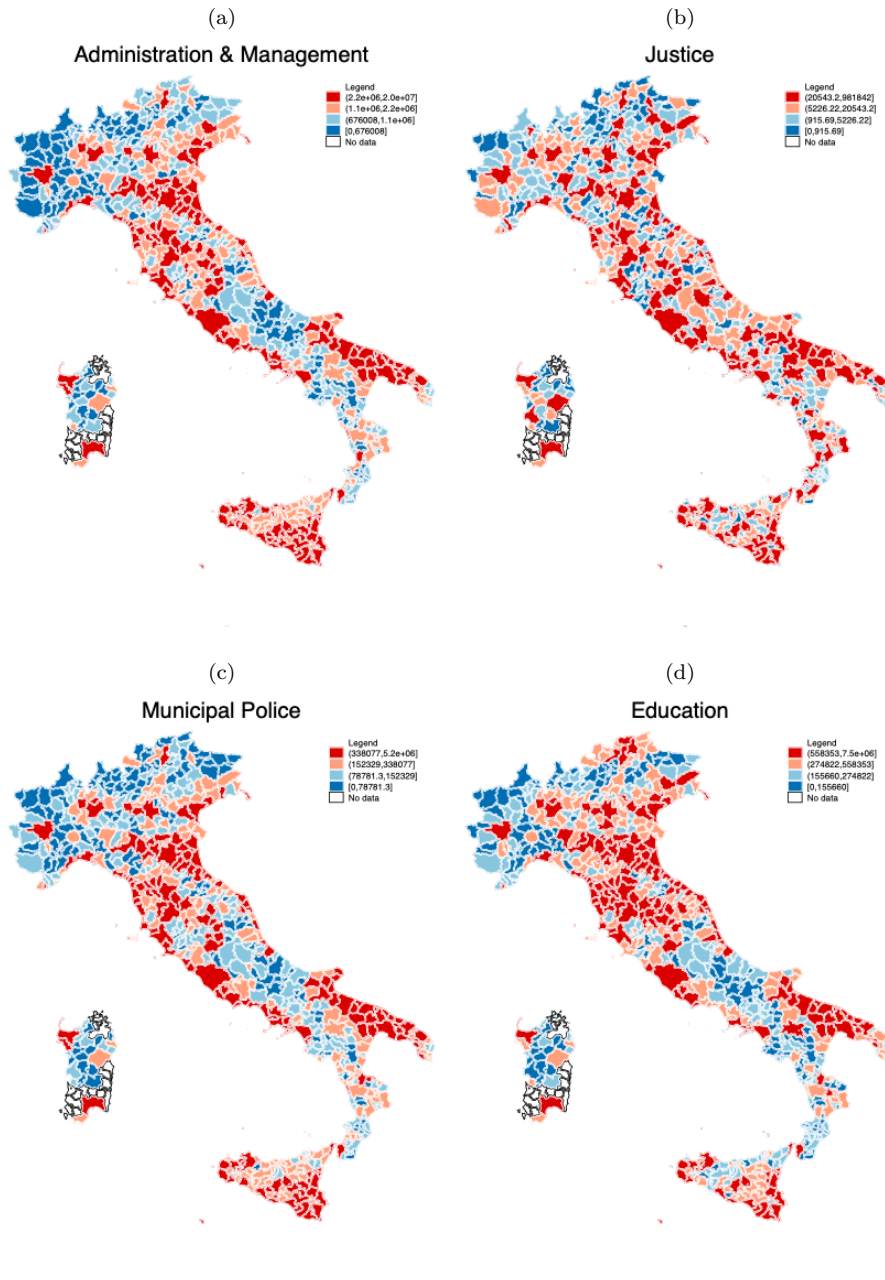
Note: Authors' elaboration from ISTAT, AIDA and AIDA PA database.

Figure A2: Graphical representation of the financial data at LMA level - Current and Capital spending



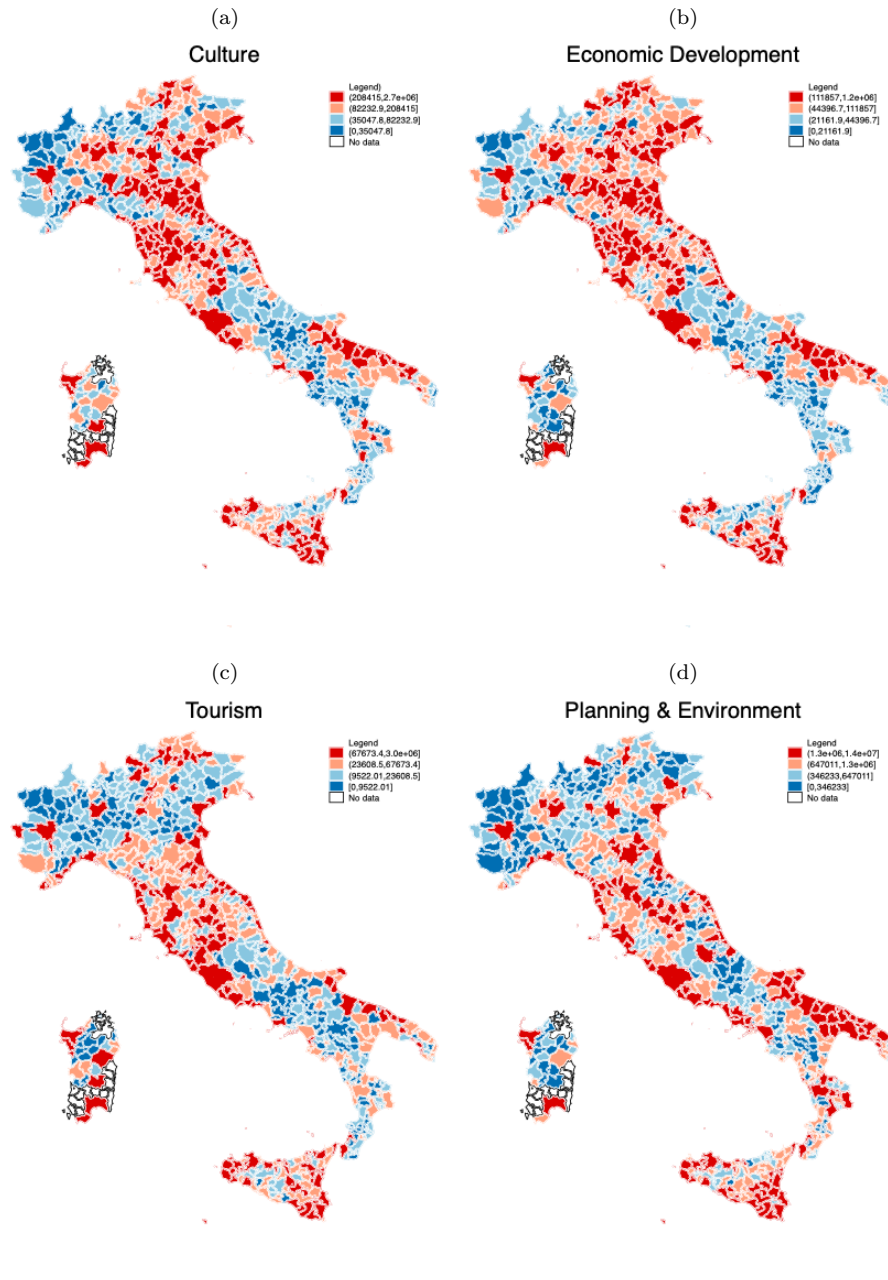
Note: Authors' elaboration from AIDA PA database.

Figure A3: Graphical representation of the financial data at LMA level - Expenditure in Administration & Management, Justice, Municipal Police and Education



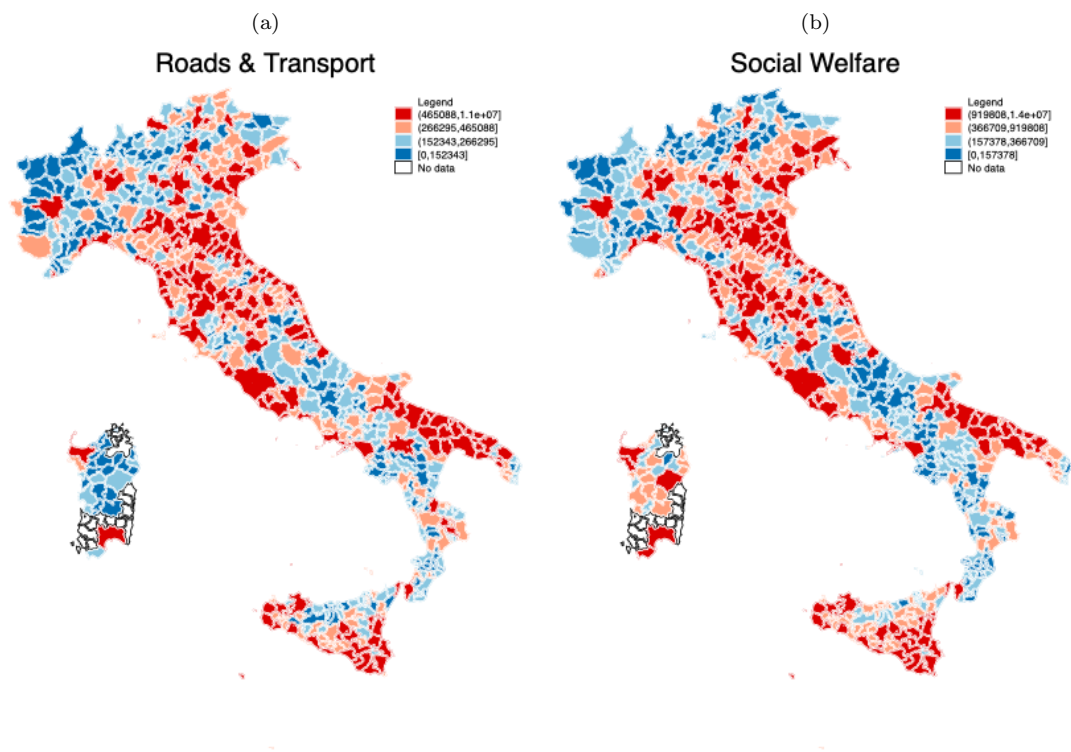
Note: Authors' elaboration from AIDA PA database.

Figure A4: Graphical representation of the financial data at LMA level - Expenditure in Culture, Economic Development, Tourism and Planning & Environment



Note: Authors' elaboration from AIDA PA database.

Figure A5: Graphical representation of the financial data at LMA level - Expenditure in Roads & Transport and Social Welfare



Note: Authors' elaboration from AIDA PA database.