Finding a local fiscal multiplier:

Do local elections matter?*

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Abstract

We propose a novel instrument to compute local fiscal multipliers. We use the fact that mayors increase spending just before local elections, which are held at regular 4-year intervals, to capture exogenous spikes in local spending, in both current and investment expenditures. We use a rich panel of 278 Portuguese mainland municipalities, with fiscal, economical and political data, to quantify the fiscal policy transmission mechanism between 1986 and 2014. We find that a 1% increase in local investment or current spending generates a contemporaneous increase between 1.5% and 1.7% in the number of full-time workers working in the private sector in the municipality. We also find evidence of a modest increase in the average wage, between 0.2% and 0.6%, one year after the election. Finally, we show that multipliers are higher in bigger municipalities and lower for mayors in power for longer.

JEL classification: E62, D72, H30, H72.

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1 Introduction

In 2009, Barack Obama launched a $787 billion stimulus package to boost recovery after the 2008 crisis. The stimulus amounted to 4% of the US GDP and was one of the largest ever implemented in the US (the New Deal stimulus, for instance, amounted to 1.5% of GDP), increasing the resources available for investment from central to local level. In a speech, in 2008, he stated "We've got shovel-ready projects all across the country. And governors and mayors are pleading to fund it. The minute we can get those investments to the state level, jobs are going to be created".[1] In sharp contrast, the 2010 sovereign debt crisis induced a broad wave of pro-cyclical policies across Europe. Facing slower economic growth (or even recession), several countries implemented sizeable austerity packages, arguing that spending stimulus could not overlook financial stability. Germany, the biggest economy of the Eurozone, announced in 2010 an austerity package including spending cuts, tax increases and a reduction of public employment expected to generate cumulated savings of around $95 billion by 2014. These two strategies rely on two diametrically opposing views on the impact of public spending on the economy, and have triggered renewed interest in the accurate estimation of the impact of public spending on the economy.

Fiscal multipliers measure the effect of a given fiscal variable (e.g., expenditure) on an outcome of interest (e.g., output). Traditionally, the literature has focused on fiscal multipliers at an aggregate level (for individual countries or a panel of countries), with varying results depending on the countries, the time span, the policy and outcome variables and, particularly, the methodology used (Ramey, 2011, 2019). The recent literature has showed that multipliers depend on the economic context, i.e., they are state dependent. Revenue and expenditure multipliers are not the same when the economy is in expansion or recession, or when monetary policy is near the zero lower bound or even when government spending is increasing or decreasing.[2]

The key challenge in the estimation of fiscal multipliers is reverse causality, since expenditure can cause changes in output, which itself has an impact on spending. Credible estimation relies on

[1] *The big promise*, The Economist, August 2012.

[2] The study of state-dependent multipliers was pioneered by Barro and Redlick (2011) and Auerbach and Gorodnichenko (2012) that studied the sensitivity of multipliers to periods of economic expansion and recessions and by Cogan et al. (2010) that first evaluated the interplay between the monetary policy stance and the fiscal multipliers.

finding discretionary policy decisions that are unrelated to output. Since this proves a difficult task when dealing with a panel of countries, a recent branch of the literature takes advantage of the quality and availability of local level data to estimate fiscal multipliers.[3] Acconcia et al. (2014), for instance, capture spending cuts arising from dismissal of public authorities due to suspicions of Mafia infiltration in city councils to compute fiscal multipliers for 95 Italian provinces. Serrato and Wingender (2016) use shocks in population estimates to compute fiscal multipliers to 3000 US counties.[4] Both papers use a strategy similar to the narrative approach to find an instrumental variable to identify spending shocks.[5] Brückner and Tuladhar (2014) addresses the simultaneity concerns using a system-GMM, where government expenditure is treated as an endogenous regressor and instrumented with lagged expenditure, to estimate the state-dependent impact of local spending of Japanese prefectures.

Other relevant empirical studies in local fiscal multipliers using US data (for county, region or state levels), include Chodorow-Reich et al. (2012), Clemens and Miran (2012), Wilson (2012), Shoag (2013), Nakamura and Steinsson (2014), Dube et al. (2014), Dupor (2015), Fishback and Kachanovskaya (2015) Adelino et al. (2017), Dupor and Guerrero (2017) and Dupor and McCrory (2018). Outside the US, Buchheim and Watzinger (2017) performed a county-level study for Germany, while Corbi et al. (2017) evaluated effects economic effects of federal transfers to Brazilian municipalities. A comprehensive overview of the literature and a discussion about the relationship between local and national fiscal multipliers is provided by Chodorow-Reich (2018).

In this paper, we use local elections to capture discretionary spending increases and compute their effect on local output in Portuguese municipalities. Levitt (1997) uses a similar instrument to identify the impact of police on crime, taking advantage of the fact that the size of the police force increases disproportionally in mayoral and gubernatorial election years. The validity of our instrument relies on an extensive literature on political business cycles. Coelho et al. (2006) and Veiga and Veiga (2007) show that there is evidence of local political business cycles in Portugal. Fiva and Natvik (2013) provides an empirical application for Norwegian municipalities, and

[3] Although national and subnational multipliers are not directly comparable, as it has been discussed in the literature (Ramey, 2011, Chodorow-Reich, 2018).

[4] Guo et al. (2016) use earmarked transfers to National Poor Counties in China to compute local spending multipliers for 1800 Chinese counties.

[5] The narrative approach was pioneered by Romer and Romer (2010) and it is frequently used (and widely discussed, e.g. Hebous and Zimmermann (2018)) in the estimation of macroeconomic fiscal policy effects.

Drazen and Eslava (2010), for Colombian ones. Our instrumental variable approach has two main advantages: *i)* it is easy to understand and implement; *ii)* it is easier to replicate for other countries, because it is less context-specific than the approaches used so far. In fact, replicating our strategy in other countries could provide important insight from a comparative perspective. We also contribute to the literature on state-dependent local fiscal multipliers, by analysing the influence of the size of the municipality and the political cycle on the fiscal transmission mechanism.

To compute the multipliers of local spending in Portuguese municipalities we gather a comprehensive database of local spending and local output measures. Information about expenditure and revenues of 278 Portuguese mainland municipalities is continuously available between 1986 and 2014. We focus on the effects of fiscal expenditure manipulation, particularly in infrastructure investment and current expenditure.[6] Our main outcome variable is the total private wage bill of full-time employees in the municipality. We further decompose the wage bill into a price component (the mean wage) and a quantity component (the number of workers in the municipality). Our goal is to assess what drives the effects on the wage bill, which is key for an adequate understanding of possible policy implications.

The main results are as follows. We show that local spending spikes lead to a positive change in the local wage bill. Increasing spending per capita by 1% leads to a boost between 0.09 and 0.14% of the contemporaneous wage bill. The effect is driven by local employment, which increases between 1.5 and 1.7%, on average, in response to investment and current expenditure, respectively. We also show that this effect is influenced by contextual factors. Multipliers are substantially higher in bigger municipalities and lower in municipalities where the mayor has been in power for more than 3 terms.[7]

The remainder of the paper is organised as follows. In the next section we present a brief discussion about the institutional framework in Portugal. Section 3 shows the main features of our data and Section 4 describes our empirical model and the identification strategy. We then

[6] Investment expenditure is the most significant component of capital expenditure and includes expenses on land acquisition, housing, other buildings and constructions - road works, public space maintenance, waste treatment, etc. Current expenditure is mainly comprised of local public sector payroll and purchases of current goods and services.

[7] We focus specifically on 3 terms because that is the maximum number of terms allowed under the term limit law currently in place. Term limits for local government bodies were implemented in 2005 (Law 46/2005) and they were binding for the first time in 2013.

present our main results. Section 6 discusses state-dependent local fiscal multipliers. The last section concludes.

2 Institutional Background and Local Fiscal Policy

Fiscal policy in Portugal is defined both at the central and local levels.[8] The local administration is split between the municipality and the parish levels. The mainland territory is divided in 278 municipalities, which are subsequently divided in a total of 2882 parishes.[9] Each municipality has a Town Council (executive body), headed by the mayor, and a Municipal Assembly, the legislative body.

The local government aims at improving the well-being of inhabitants, promoting social and economic development, managing territorial planning and providing local public goods.[10] As described in *Direção Geral das Autarquias Locais (2004)*, municipalities manage, and in some cases provide, rural and urban equipments, energy, transportation, education, health care and sports, civil protection, municipal police, sewage and waste collection and social welfare local policies. The highest proportion of revenues stems from transfers from the central government, exogenous to municipalities. They are free to set and collect fees within some legal limits; as regards local taxes, the municipalities rely on a property tax, surtaxes on the personal and corporate income taxes, which they can set within given tax ranges, and an indirect tax on the sale of real estate, which is set by the central government. Importantly, municipalities cannot change the tax base. It is therefore fair to assume that municipalities have more autonomy in choosing spending allocation than the total revenue they collect.

The accounts of local government bodies are public and made available on a yearly basis.[11] They provide information at the municipal level and specify both revenue and expenditure totals and

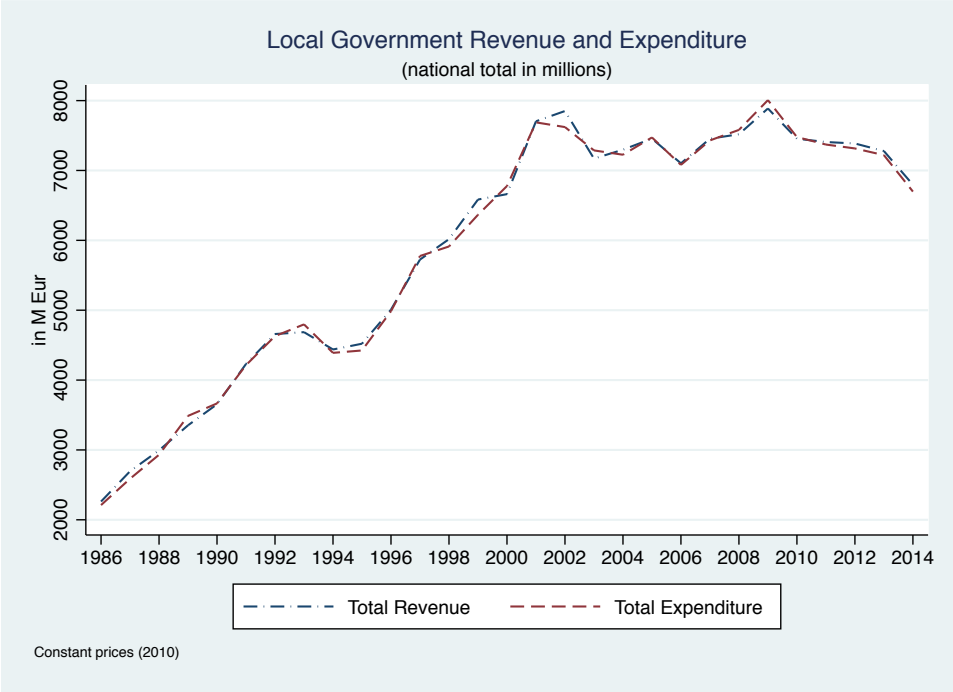
[8] The Portuguese territory includes a mainland territory and two autonomous regions, the islands of Azores and Madeira. Given that the two archipelagos have autonomous regional governments, with some freedom to define fiscal policy locally, we concentrate on the mainland territory.

[9] Out of the current 278 municipalities, 3 were created in 1998 (Odivelas, Trofa and Vizela), therefore our empirical analysis will make use of 275 municipalities. Including the islands (the Autonomous Regions of Madeira and Azores), there are 308 municipalities, divided in 3091 parishes.

[10] Law 159/99, Law 169/99 and Law 5-A/2002 jointly define the competences and attributions of all local level administrative bodies.

[11] These accounts have been published by the Local Administration Authority, DGAL, an entity within the Ministry of Internal Affairs, since 1978. The figures are available for all years except 1984 and 1985.

Figure 1: Per capita revenue and expenditure



breakdowns in a set of baseline categories.

The following graph plots the evolution of total spending and total revenue of mainland municipalities in Portugal, in real terms, from 1986 to 2014.[12]

Local spending increased sharply until 2001 (from around €2bn to almost €8bn), stabilises between 2001 and 2008, and contracts sharply after 2009 (to less than €7bn in 2014), as a response to the European Sovereign Debt Crisis and the fiscal adjustment programme implemented in Portugal between 2011 and 2014. Total revenue follows closely the evolution of spending, hence there is no concern of deficit accumulation in the period under analysis.

This path is roughly consistent with the business cycles for the Portuguese Economy.[13] Between 1986 and 1999 the macroeconomic fundamentals evolved positively: the average real GDP growth was around 4%, while inflation stabilised at 2.3% in 1999 (dropping from 12.6% in 1986); additionally, the unemployment rate decreased from 8.3% (in 1985) to 4.4% in 1999.

[12] As we discuss later, the time frame of the analysis is decided based on data availability regarding the outcome variables of interest.

[13] After a long period of right-wing dictatorship (between 1933 to 1974), the period between 1974 and 1980s was characterised by high economic and political instability. In 1986 Portugal joined the European Union and, in the following years, economic stability and economic growth increased, with European structural and cohesion funds playing a key role in increasing the country's development and the standards of living of the population.

Since 2000, economic conditions deteriorated with an average real GDP growth of 1.38% until 2008, and -0.81% between 2009 and 2013.[14]

Figure 2: Per capita revenue disaggregation

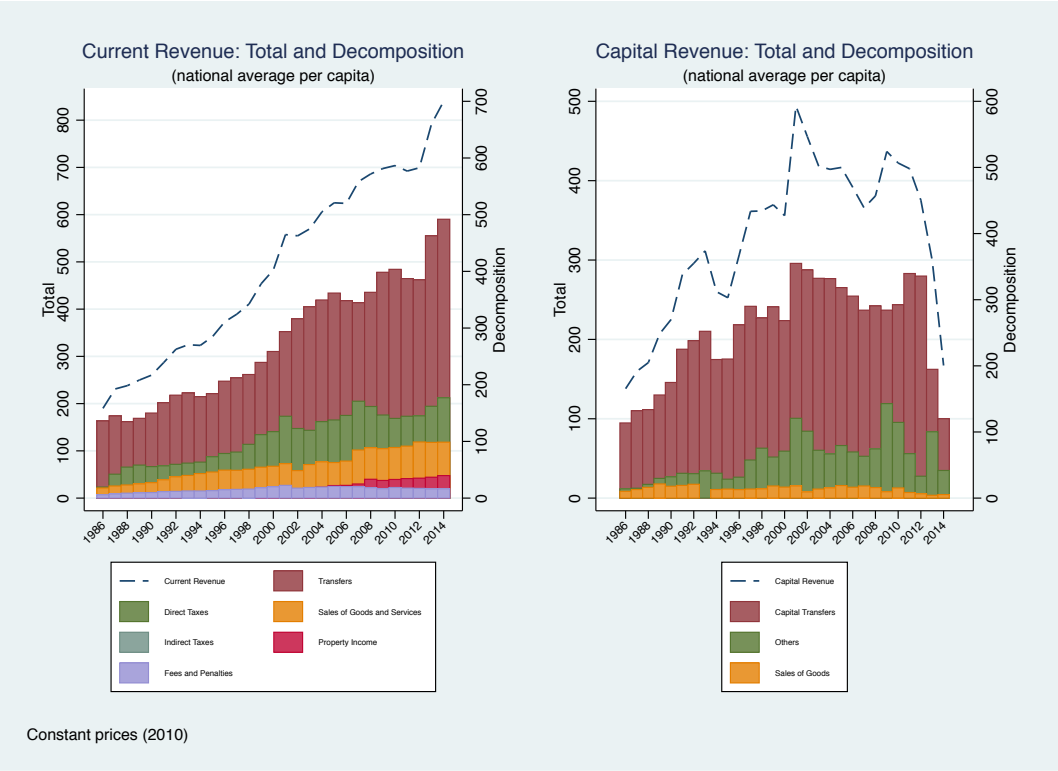
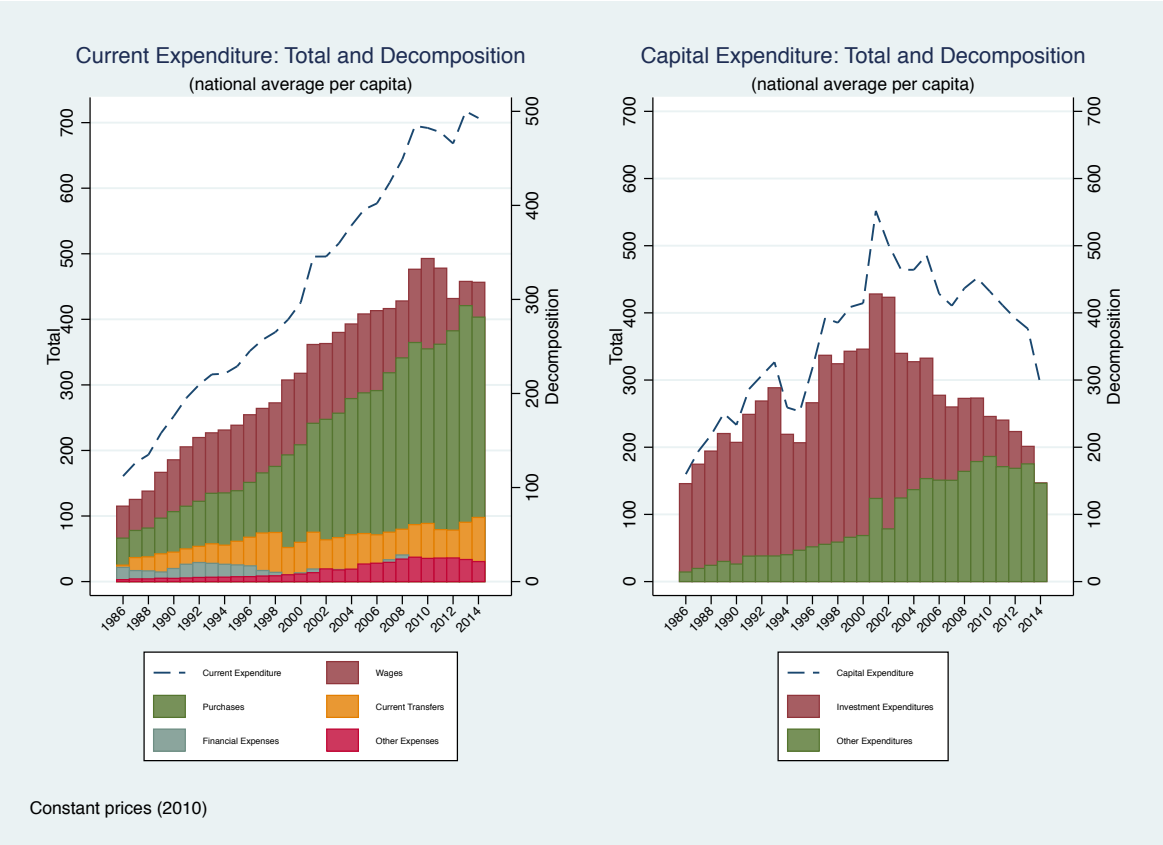


Figure 2 shows the disaggregated per capita revenue into its current and capital components.

The disaggregation of local per capita expenditure is shown below. The main items of current expenditure are payroll and the purchases of goods and services, while the most important component of capital expenditure is investment. Investment expenditures include all increases in fixed capital. Such an increase may be due to a purchase or production of durable goods, or improvements in the existing goods to boost their productivity or life span. Other capital expenditures include financial expenditures and capital transfers to parishes.

[14]Source: PORDATA and Bank of Portugal.

Figure 3: Per capita expenditure disaggregation



The breakdown of total investment expenditure is as shown in Appendix A, in Figure 6. Panel A shows that the average investment expenditure per capita peaked at more than €400 in 2001 and 2002, and has been declining since then. The relative weight of all seven components is relatively stable, as shown in Panel B. Overall, miscellaneous constructions and expenditures associated with other (non housing) buildings are the most relevant components. Miscellaneous constructions include street and complementary construction/maintenance, sewage, water distribution and treatment, waste treatment and a residual expenditure category, while other buildings reflect expenditure in sports facilities, social infrastructure and a residual category.

In this paper, we focus on expenditure side policy, particularly in total current expenditure and in a subset of capital expenditure, investment spending.

3 Data

We use data on local public finance accounts; municipal economic, social and demographic indicators; macroeconomic fundamentals and municipal political data. The time span of our analysis is constrained by the simultaneous availability of these types of data. As a result, we focus on the period between 1986 and 2014.

Local public finance data, including the expenditure variables that are our key explanatory variables, is obtained from the Local Administration Authority, an entity under the supervision of the Ministry of Internal Affairs, as explained in section 2. As regards the outcome variable, we proxy local output using the total wage expenditure of full time private sector workers in each municipality. Although national wage expenditure does not reflect all output variations, this is the best proxy available since we have no measure of GDP disaggregated to the municipal level in Portugal.[15] As we show in Figure 7, in Appendix 3, the changes in the national wage bill of private sector workers measured in real terms are very close to the growth rate of real GDP across time (Panel A). Panel B shows the strong correlation between the two variables.

We further disaggregate changes in the wage bill into changes in the average wage paid to employees (price effect) and the number of employees (quantity effect). All the employment and wage data is obtained from the Portuguese linked employee-employer administrative dataset (*Quadros de Pessoal - QdP*), which includes information about all the companies operating in Portugal, collected by the Ministry of Employment.

The mean wage is obtained by calculating a simple average of wages of full time workers by municipality.[16] Our measure includes both the fixed and the variable components of wages, to capture any fluctuations in wages. In Portugal, reducing the base wage (the main fixed component) is generally not legally possible, so we expect that changes in wages resulting from local government stimulus occur mainly in the variable components of wages.[17] The total number

[15] Another measure of local GDP is the local value added. However it is only available from 2001 onwards and at the NUTS III level. NUTS are official statistical units defined by the Eurostat. Currently, the mainland territory of Portugal is divided into 25 NUTS III.

[16] The maximum amount of regular work time is defined by law and set to 40 hours/week. However, collective bargaining agreements stipulate different limits for different sectors, like banking (35 hours/week). To avoid excluding particular sectors, we code all workers with at least 35 hours/week (140 hours/month) of paid work as full-time. This excludes roughly the bottom 1% of the sample in every year.

[17] According to the article 129 of the Labour Law (Law 7/2009) employers are not allowed to demote or reduce wages of workers, unless in very strict conditions (as when the company is facing severe financial difficulties).

of workers in the municipality is the sum of the full-time workers in all the companies (or their subsidiaries) located in a given municipality.[18]

Other socio-demographic variables, like population density, lagged local budget deficit, lagged change in number of firms in the municipality, were also collected. Such variables are used mainly as controls, as the effectiveness of government spending is likely to be conditioned by several municipal-specific factors.

We capture the national business cycle with a set of macroeconomic controls, obtained from the Bank of Portugal Statistics and the International Financial Statistics (IMF). These macro-controls include real GDP growth, fixed capital accumulation as share of GDP, national unemployment rate, private consumption as share of GDP and the reference interest rate of 10 year treasury bonds. The option to include time dummies is not available as these would be collinear with our instrument, which is an election year indicator.

Finally, due to the nature our identification strategy, we also collect a set of political variables. The political wing of local governments, the number of terms the mayor has been in power and a set of dummies to signal whether the party in power has a majority in the Town Council and the Municipal Assembly, and political alignment with the central government.

All the data used is annual, with all monetary variables at constant prices of 2010, converted using the GDP deflator. Descriptive statistics are provided in Appendix A, Table 8.

4 Methodology

Our empirical model draws on the literature about fiscal transmission mechanisms at local level, particularly Acconcia et al. (2014). The baseline specification we estimate is:

$$y_{t,i} = \alpha_i + \eta trend_{t,i} + \beta g_{t,i} + \gamma X_{t,i} + \varepsilon_{t,i}, \tag{1}$$

where α_i are municipal fixed effects, $trend_{t,i}$ is a linear municipal specific time trend, $X_{t,i}$ is a set of controls and $\varepsilon_{t,i}$ is the error term. The outcome variable, $y_{t,i}$, is the percentage change of the

[18] Therefore, outcome variables are source-based rather than residence-based. If someone lives in a municipality but works in another, his wage and employment will be considered in the latter.

per capita wage bill (or the mean wage/the number of workers) in municipality i. Finally, $g_{t,i}$, represents the difference in the per capita spending variable (current or investment expenditure) from period $t-1$ to period t, scaled by the lagged outcome variable of interest.[19] This follows Barro and Redlick (2011) and ensures that both spending and output variables enter the equation in the same relative units, so that the estimate of β is directly the impact multiplier. Two recent studies about local fiscal multipliers, Acconcia et al. (2014) and Ramey and Zubairy (2018), also use the same scaled change in spending instead of a regular percentage change.[20]

The vector of controls, $X_{t,i}$, includes up to two lags of the outcome and government spending variables (to account for potential autocorrelation) and a set of socio-demographic and political controls (microeconomic controls) and of macroeconomic fundamentals (macroeconomic controls). To control for time variant effects we include a linear municipality-specific time trend, as in De Witte et al. (2018) or Besley and Burgess (2004), as well as a set of macro economic controls.[21]

Estimating equation (1) carries a number of challenges. First, if government spending can lead to changes in output, it can also be the case that spending is driven by it. Although local spending is arguably less responsive to output than aggregate, country-level spending, there are a number of channels through which it may be influenced by municipal economic activity. Municipalities have a number of responsibilities in the social area, such as childhood and elderly care, or public housing, in which family contributions are usually indexed to private income, and the remainder has to be covered by the municipal budget; mayors may respond to the economic cycle by spending more (or less) to overcome the cycle; finally, public employment may be used to counteract periods of high unemployment. Consequently, credible identification must rely on an exogenous source of variation.[22]

[19]Specifically, the spending and outcome variables are given by: $g_{t,i} = \frac{G_{t,i} - G_{t-1,i}}{Y_{t-1,i}}$ and $y_{t,i} = \frac{Y_{t,i} - Y_{t-1;i}}{Y_{t-1;i}}$.

[20]Including actual changes of both variables would lead to an elasticity that could be converted ex-post to a multiplier, typically by multiplying the elasticity by the sample average ratio of the output variable by the spending variable. As discussed in Ramey and Zubairy (2018) post-estimation of fiscal multipliers from elasticities can lead to over estimation of multipliers, particularly for wide time spans.

[21]The inclusion of municipality-specific time trends allows for each municipality's time variant characteristics to evolve according to an idiosyncratic trend.

[22]The macro literature addresses endogeneity with a variety of techniques(Whalen and Reichling (2015), Hernández de Cos and Moral-Benito (2016)). The two most common approaches are *i)* based on econometric/empirical assumptions, as in the Choleski Decomposition or the Blanchard and Perotti (2002) identification scheme, and *ii)* the narrative approach (Romer and Romer, 2010), where researchers identify particular exogenous movements in fiscal policy using different sources of information (like news reports or major historical events). Econometric-based methods like VARs and, more recently, the Local Projection Method of Jordà (Jordà, 2005),

In this paper, we use election episodes to instrument local spending.[23] Our IV specification is implemented using 2SLS, with the spending variable of interest being instrumented with a dummy variable that is equal to one whenever a local electoral episode occurs, $D.local\_election_t$. Thus, the first stage regression of our baseline specification is:

$$g_{t,i} = \alpha_i + \eta trend_{t,i} + \delta D.local\_election_t + \gamma X_{t,i} + v_{t,i}, \tag{2}$$

where δ measures the effect of the occurrence of a local election in the local spending variables and $v_{t,i}$ is the error term. The second stage equation is then given by:

$$y_{t,i} = \alpha_i + \eta trend_{t,i} + \beta \widehat{g_t} + \gamma X_{t,i} + \varepsilon_{t,i}, \tag{3}$$

where β is the impact local fiscal multiplier. All equations, otherwise explicitly stated, are weighted by the municipal population level to reflect municipal size heterogeneity, as in Shoag (2013) and Acconcia et al. (2014). Standard errors are robust and clustered to account for heteroskedasticitiy and possible spacial correlation (due to common municipal/regional characteristics).[24]

4.1 Identification strategy: Local Elections and Government Spending

Several studies have documented that politicians manipulate spending for electoral purposes, a result which has been confirmed for Portugal by Veiga and Veiga (2007).[25] We depart from this result and use the political business cycle to compute local fiscal multipliers for Portuguese municipalities, between 1986 and 2014. Our data spans seven electoral episodes, corresponding to 4 year terms, in 1989, 1993, 1997, 2001, 2005, 2009 and 2013.[26]

All the elections in our sample occurred in the last quarter of the respective year; therefore, we

require different identification assumptions when compared with estimates in the context of DSGE models, for instance.

[23] Instrumental variables can be seen as the microeconomics counterpart of the narrative approach.

[24] As in Acconcia et al. (2014), we cluster at the NUTSIII×year level, to incorporate the business cycle common particularities of neighbouring municipalities. Our results are robust to clustering at the NUTSIII or at the municipality level.

[25] Eslava (2011) provides a discussion about the motivations of fiscal deficits, including the opportunistic behaviour of politicians that use them to win elections.

[26] The first local election in Portugal was in 1976. Between 1976 and 1985 four elections took place, as initially local mandates were set to 3 years. From 1985 onwards elections occurred every 4 years.

assume that elected local governments only take office effectively in the following year, as the budget in place up to the end of the election year was prepared by the former incumbent Town Council.[27] The election of 2005, for instance was held in October 9th. The mayor takes office up to 20 days after the final results of the election are determined and has to prepare the budget for 2006 in the three months that follow. The budget in place until December 31st of 2005 was approved in the last quarter of 2004. In this context it is realistic to assume that the incumbent local government decides in the last quarter of 2004 whether it is going to hike up expenditure in order to increase the odds of being re-elected in the 2005 election.[28]

Figure 4: Local Government Spending and Municipal Elections

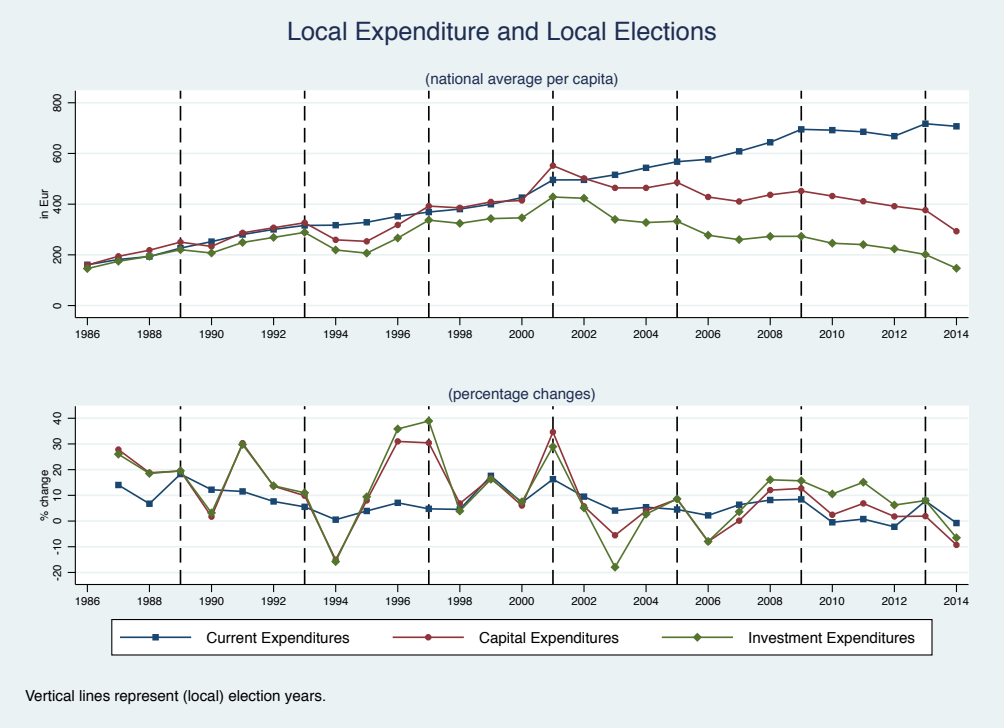


Figure 4 plots the national average of per capita spending variables of interest. Vertical lines highlight years in which local elections took place.

The upper panel provides the national average, in levels, of the spending variables. Current

[27] According to the Law 73/2013, that establishes the financial rules and procedures for local governments, the budget of year t is prepared by the Town Council and submitted for approval to the local deliberative branch, the Municipal Assembly, up to the end of October of $t-1$. If local elections took place between July 30th and December 15th (as occurs in every election year in our sample) the budget proposal should be submitted up to three months after the elected government formally takes office.

[28] Even if the mayor does not run for the election, he may still wish to increase spending to increase the chances of the candidate he endorses (most likely, belonging to the same party) being elected.

expenditures increase throughout the sample period (blue line); however, larger increases seem to occur in electoral years. Capital expenditures, and particularly Investment expenditures (red and green lines), are more volatile and increase more sharply in electoral years. This pattern is even clearer in the bottom figure, that plots the year-on-year change in the same variables, where all variables exhibit positive growth rates in election years.

Table 9, in Appendix B, shows the sample average of the spending variables in election and no-election years. Investment expenditure per capita is €38 higher in election years (corresponding to a 12.8% difference) and the differences are significant up to the 1% level. Differences in current expenditures are, as expected, less sizeable (+€42 and +3.4%) and the statistical significance of the test of difference in means is smaller.

Next, we tackle the exclusion restriction.

4.2 Validity of the Instrument

To argue for the exogeneity of our instrument, we need to establish that *i)* changes in outcome variables do not lead to election episodes and *ii)* that election episodes only affect the outcome variables through the government spending channel.

Local electoral episodes are scheduled by the central government at least 80 days in advance.[29] The length of each term is defined ex-ante and set to four years. If the local government is for some reason dismissed, the mayor can either be replaced or an interim election may occur. The mayor who is elected in the interim election serves a short term only until the following pre-determined nationwide local election. In the period covered by our analysis, only three interim elections occurred.[30] Therefore, local elections are exogenous to local decision makers and the evolution of local outcome variables, whether positive or negative, does not affect the pre-determined electoral calendar.

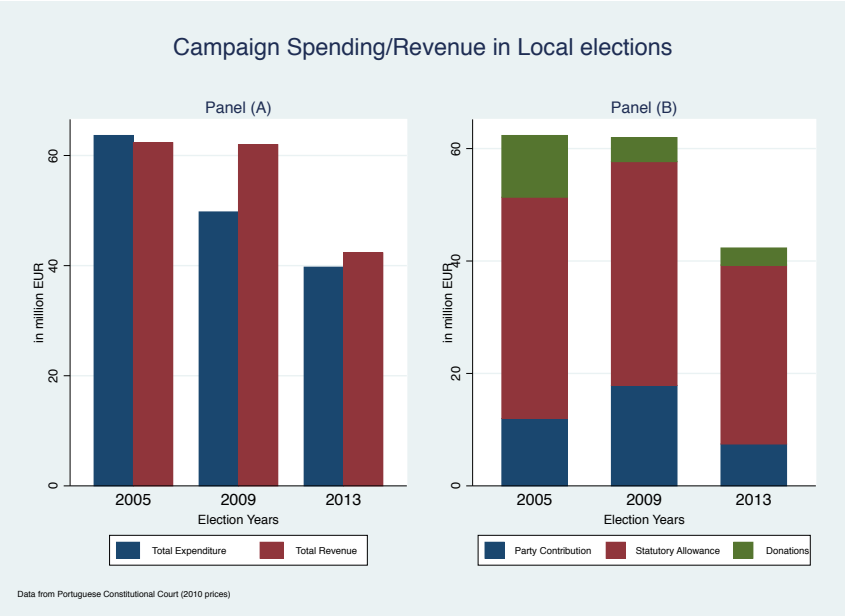
As regards the exclusion restriction, note that most of the expenditure directly associated with elections is campaign spending, mostly financed through public funds. The legislation in Portugal restricts campaign funding sources to party/candidate contributions, private donations

[29] Law 1/2001, August 14th.

[30] The most important was in Lisbon, in 2007, because the incumbent mayor lost the support of his political party.

(heavily restricted) and a statutory public allowance attributed to candidates by the national government.[31] As a consequence, most of the spending is financed by the statutory allowance. In the next figure we plot the costs and funding sources of three local election episodes, based on the reports that candidates submit to the Portuguese Constitutional Court for audit.[32]

Figure 5: Campaign Spending in Local Elections (2005/09/13)



Panel (A) shows total (national) expenditure and funding associated with campaigning for the five biggest Portuguese parties, whether they are running by themselves or in a coalition. These parties are, from the left to the right of the political spectrum, the Left Bloc (BE), the Portuguese Communist Party (PCP), the Socialist Party (PS), the Social Democrat Party (PSD) and the People's Party (CDS). In 2005 these parties spent a total of 64 million euros. Since then total spending has been declining, due to changes in the campaigning laws that reduced spending limits per municipality and also the maximum statutory allowance available per municipality. As it is clear from panel (B), the most important source of funding is the statutory allowance, with donations playing a residual role. Table 10, in Appendix B, provides more detailed information on campaign spending figures, showing that in 2005, for instance, 63% of the spending was

[31] Parties and campaigning funding and expenditures are regulated by the Law 19/2003, subsequently altered by Law 64-A/2008, Law 55/2010, Law 1/2013 and Organic Law 5/2015.

[32] Detailed expenditure and revenue reports are required under the Law 19/2003 and are available from 2005 onwards.

financed by the statutory allowance. There are coalitions in the data, which are decided case-by-case, depending on the political situation in each municipality.[33] Although other parties and independent candidates run for local elections, they gather a very small amount of votes when compared to the big five. In 2005, for instance, out of the 308 municipalities, 301 mayors were elected in one of the five big-party lists, and only 7 were independent.

The reduced importance of donations and the fact that even party contributions are in some sense publicly funded alleviate potential concerns about campaign spending being a shock to the local economy *per se*.[34] Additionally, it is important to stress that most of the spending is associated with campaigning materials, that include outdoors, flyers and political events.

Figure 10, in Appendix, shows the campaign spending of the top 5 contenders in Portuguese local, presidential, European and general elections, as a percentage of the GDP of the respective year. Local elections, due to their nature, are the ones carrying the highest campaigning costs despite the fact that they represent, at their peak, less than 0.04% of the GDP. It is, therefore, unlikely that this spending has more than residual direct effects on the economy.

The only other cost that can be attributed directly to election episodes are the administrative costs of organising the election. In 2005, that figure amounts to €7,3m and includes all the expenditure that the Direction of Internal Affairs bears in election logistics.[35] Its most significant component (63% of the €7,3m) is the compensation offered to the members of voting assemblies for the administrative tasks performed on the election day. The resources to support this spending come from the budget of the Ministry of Internal Affairs that transfers most of the funds to the local administration, that in turn pays suppliers and administrative staff.[36]

We also investigate whether elections (even if non-local) are, in itself, a shock to our local spending variables. This is relevant to establish the channel through which election episodes can affect local economic developments. In the absence of a proper counterfactual, we regress our local spending variables on dummies that are equal to one whenever there is an election (local

[33] Most coalitions in our period of analysis are between the centre-right PSD and the right-wing CDS.

[34] Party contributions are financed by the parties' budget, which is also heavily regulated. Parties survive mostly based on public grants they are entitled to.

[35] This cost is smaller than the administrative cost of the National Referendum about the decriminalisation of abortion held in 2007 that, according to the same source, had a €9,1m cost.

[36] Moreover, it is likely that the administrative costs are a function of the municipal population size, for which we control in our regressions.

or not) in our sample.

Results are shown in Table 1. In practice, we are running a simplified version of our first stage equation, equation (2), to check whether the strong positive correlation observed for both outcome variables and local election episodes (in the first line of the table) also occurs for non-local elections. These regressions include municipal fixed effects and the standard errors are robust and clustered at the municipal level. Recall that spending variables in our empirical model are differences in spending scaled by the lagged outcome variable. As a result, in Table 1, the outcome variables in columns (1) and (3) are spending changes scaled by the per capita wage bill, in columns (2) and (4) by the mean wage and in columns (3) and (5) by the number of workers

Table 1: Effects of election episodes on local government spending.

	Investment Expenditure (per-capita)			Current Expenditure (per-capita)		
	Wage bill	Mean Wage	Workers	Wage bill	Mean Wage	Workers
	(1)	(2)	(3)	(4)	(5)	(6)
D.local election	44.686***	4.299***	4.760***	32.837***	2.830***	3.364***
	[11.254]	[0.705]	[1.397]	[10.727]	[0.691]	[1.062]
D.general election	15.645	1.627**	1.127	-5.757	-1.152	-0.535
	[12.553]	[0.627]	[1.414]	[9.829]	[0.628]	[0.986]
D.european election	-27.455**	-1.385**	-3.329**	9.755	0.279	0.948
	[13.082]	[0.687]	[1.510]	[6.619]	[0.431]	[0.712]
D.presidential election	75.473***	4.056***	7.990***	15.863	0.785	1.251
	[16.834]	[0.904]	[1.888]	[14.722]	[0.941]	[1.468]
D.any non-local election	-6.998	-1.029	-1.032	-19.282**	-1.759***	-1.833**
	[12.287]	[0.644]	[1.406]	[8.008]	[0.506]	[0.801]
N	7733	7733	7733	7733	7733	7733

Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the lagged outcome variable of interest (Current Expenditure is defined analogously). The explanatory variables D.local_election, D.general_election, D.european_election and D.presidential_election are dummies that are equal to one in every year a local, general, European or presidential election occurs, respectively. D.any_non_local_election is a dummy variable, equal to one when a non-local election episode occurs. All regressions are estimated separately and in all cases they include municipal fixed effects. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Overall, there is no consistent pattern (of positive correlation) in any type of election aside from the local elections, which shows that these politically motivated spending spikes are specifically associated with municipal elections. The only exception are the presidential elections, for investment expenditures. These results are driven by the fact that presidential and local elections sometimes occur in the same year. Moreover, the Portuguese President has no executive powers in general and cannot influence the budget of local municipalities directly. So it is not plausible that spending in local elections is being driven by presidential elections. To circumvent possible confounding effects due to the timing of non-local and local elections, in the last line of the

table we report the estimates for a dummy that is equal to one whenever non-local election occurs. The coefficients are negative in all cases and are significant only for current expenditures, establishing that, on average, a non-local election has, at best, a negative impact on local spending.

Our instrument therefore satisfies the conditions for unbiased estimates of local fiscal multipliers. Moreover, it has the potential of being replicable for future research; in fact, it was already used by Levitt (1997). Most studies about local fiscal multipliers are based on the particularities of the *American Recovery and Reinvestment Act*, ARRA (Chodorow-Reich et al., 2012, Wilson, 2012, Dupor and McCrory, 2018), or using a set-up with strong links to country particularities. Acconcia et al. (2014), for instance, uses council dismissals in Italian municipalities as an instrument for the decline in local spending, an identification strategy which is unlikely straightforward to replicate in other settings.

5 Baselines Multipliers

In this section we present the baseline estimates of the main model, described by equation 1. In each of the following tables we present the estimates of local investment and current expenditure on the three outcome variables of interest: the wage bill, the mean wage and the number of full-time workers in the municipality. Overall, OLS estimation of equation 1, reported in the first two columns of each table, yields multipliers of the expected sign, but very small and generally not statistically significant. Our IV estimates, obtained from estimating equations 2 and 3 in a 2SLS framework, provide more sizeable multipliers, both for investment and current expenditure.

The impact multipliers of local spending on the wage bill are presented in Table 2. The first stage estimates show a clear positive impact of local elections on local government spending, particularly for investment expenditure. The F-test of excluded instruments is well above 10 (42 for investment expenditure and 19 for current expenditure), which provides further support for our identification strategy.

Table 2: Wage Bill Multipliers

	OLS		IV			
			1st St.	2nd St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)
Investment Expenditure	0.00**			0.09***		
	[0.00]			[0.02]		
Current Expenditure		0.00				0.12***
		[0.00]				[0.04]
D. local election			30.94***		22.89***	
			[4.66]		[5.18]	
Observations	7172	7172	7172	7172	7172	7172
R Sq.	0.02	0.02	0.05	-	0.29	-
F-stat	4.12	3.73	11.89	6.18	5.49	6.34
p-value	0.0011	0.0024	0.0000	0.0000	0.0001	0.0000
F-test excl.	-	-	42.14	-	18.72	-
p-value	-	-	0.0000	-	0.0000	-

Notes: Annual data at municipal level, between 1986 and 2014. Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year private-sector wage bill (Current Expenditure is defined analogously). The Wage bill is the percentage change on the per-capita municipal expenditure in private-sector wages of full-time employees (at least 140 paid hours/month). All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. Two lags of the spending and the outcome variable are also included. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using D.localelection as an instrumental variable, which is equal to one in all local election years. Significance levels: * p<0.1, ** p<0.05, *** p<0.01

The impact of these politically motivated spending spikes on the wage bill is 0.09, for investment expenditure, and 0.12 for current expenditure, both significant up to the 1% level. These figures imply that a spending increase of 1% causes a contemporaneous increase of 0.1% in the wage bill.

Table 11, in Appendix C, shows the effects of the lags of the outcome and explanatory variables. Interestingly, both the first and the second lags of investment expenditures are significant and positive (column 4), implying that investment expenditure affects the wage bill beyond the immediate contemporaneous effect. For current expenditures, the results are analogous, although only the first lag is significant.

Following Acconcia et al. (2014), we calculate the dynamic multipliers of investment and current expenditure, by adding up the coefficients of contemporaneous and one-year lag of spending (while correcting for lagged effects of the outcome variable), to capture the (two years) cumulative effects of local spending.[37] For investment expenditures this dynamic multiplier amounts to 0.09, while for current expenditures it is approximately 0.17.[38] Notice also that investment

[37] As usual in fiscal multiplier literature, we assume that lagged spending is exogenous to the current state of the economy.

[38] Using the information on Table 11, Appendix C, the calculations are straightforward: $\beta_{inv} \approx 0.085 \approx$

and current spending decisions do not seem to be a result of local economic activity. The coefficients of the two lags of the wage bill are not significant in the first stage equations, as shown in columns (3) and (5).

Albeit statistically strong, the actual point estimates in Table 2 seem relatively small. As discussed before, the total wage expenditure in a municipality is driven by two different components, the actual wages paid (price effect) and the number of people employed in the municipality (quantity effect). Wages and the number of workers may react differently to contemporaneous spending spikes leading to confounding effects on the wage bill. The results in Table 3 show that the wage-bill impact is mostly driven by municipal private-sector employment.

Table 3: Workers' Multipliers

	OLS		IV			
			1st St.	2nd St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)
Investment Expenditure	0.01			1.50**		
	[0.01]			[0.64]		
Current Expenditure		0.01				1.71**
		[0.01]				[0.83]
D. local election			1.30***		1.14***	
			[0.35]		[0.42]	
Observations	7172	7172	7172	7172	7172	7172
R Sq.	0.03	0.03	0.07	-	0.27	-
F-stat	2.68	2.48	7.09	2.44	3.64	3.01
p-value	0.0205	0.0305	0.0000	0.0330	0.0029	0.0107
F-test excl.	-	-	13.41	-	6.99	-
p-value	-	-	0.0003	-	0.0084	-

Notes: Annual data at municipal level, between 1986 and 2014. Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year total number of full-time private-sector workers in the municipality (Current expenditure is defined analogously). Workers is the percentage change on the total number of full-time (at least 140 paid hours/month) private-sector workers in the municipality. All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. Two lags of the spending and the outcome variable are also included. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using D.local election as an instrumental variable, which is equal to one in all local election years. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

An election leads to an average increase of 1.30% of per capita investment expenditure scaled by the lagged employment level (column 3). This positive impact is highly statistically significant and leads to a positive change in the number of workers in the municipality. An exogenous spike in local investment expenditure by 1% of the number of workers in the municipality leads to an increase in the number of full-time workers of 1.5%. For current expenditure the effects are similar. The positive relation between election episodes and spikes in current expenditure

$\frac{0.09+0.01}{1-(-0.17)}$ and $\beta_{curr} \approx 0.17 \approx \frac{0.12+0.08}{1-(-0.19)}$.

changes is present, however the F-test for the first stage is below the usual threshold of 10. Even so, we reject the null that the instruments are weak up the 1% significance level, which provides some support to our identification strategy.

To better illustrate the impact of spending on local job creation, we can calculate the cost-per-job implied by the workers' multipliers.[39] The per capita cost-per-job is calculated as the inverse of the workers' multiplier, which for investment expenditures is $1/\beta = 1/1.50 \approx 0.67$ while for current expenditure it amounts to $1/\beta = 1/1.71 \approx 0.58$. The total monetary cost can be obtained by using the population level of the mean municipality in our sample (35 154 inhabitants), this implies that the average municipality can produce a private-sector job with €23 436 investment expenditure and €20 558 of current expenditure.[40]

As in other comparable studies, we find that the OLS estimates have a significant downward bias, particularly when we assess spending effects on the number of workers. This bias indicates that local policy spending choices are not systematically driven by the state of the local economy.[41] At the same time, the existence of anticipation effects seems to be less relevant in our case. First, the presence of anticipation effects would mean that our multiplier estimates would be a lower bound estimate, which would indicate that the employment multiplier could be even higher. Second, although economic agents may expect municipal spending to increase in electoral years, they can neither anticipate it with certainty, nor anticipate the exact dimension of the increase.

It is also important to stress that our cost-per-job, ranging from $24 875 to $28 358, lies comfortably within analogous estimates from previous works.[42] Corbi et al. (2017), for instance, by exploring the discontinuties in terms of population thresholds that govern the allocation of fed-

[39] Serrato and Wingender (2016), Chodorow-Reich et al. (2012) and Buchheim and Watzinger (2017) while using different methodologies to compute their employment multipliers, report the cost-per-job to make comparisons with other studies easier.

[40] Using the average municipality population across time does not condition our estimate of the cost-per-job significantly, as population has been relatively constant during the time span of the analysis. The municipal population yearly average varies across time between 34 041 and a peak of 36 187, which would imply a cost-per-job between €22 694 and €24 125.

[41] Acconcia et al. (2014) point out that the size of the downward bias of a positive OLS multiplier could be a result of a high degree of countercyclical fiscal policy. Given the particularities of our municipal spending variables, we believe that it is not the case here. As discussed, municipal expenditure at t is defined in the municipal budget at the end of $t-1$, meaning that it is not likely that expenditure reacts contemporaneously to the state of the local economy. Additionally, the first and second lags of our outcome variables in the first stage equations of Tables 11 to 13 are generally not significant in explaining the evolution of the spending variables of reference.

[42] The conversion to USD was done using the average exchange rate of USD-EUR between 1999 and 2016, based on the annual period-average exchange rate from the IFS database of IMF.

eral transfers to municipalities in Brazil, estimate a cost-per-job of $8 000. Adelino et al. (2017) estimate that on average the cost of creating a job in US muncipalities is approximately $20 000. Similarly, Buchheim and Watzinger (2017) evaluating the effects of a sizeable German infrastructure stimulus package at the county level, estimate a cost-per-job of €25 000. Chodorow-Reich et al. (2012) finds a similar cost-per-job of $26 000 as a result of the countercyclical impulse provided by the transfers to state government under the ARRA, in 2008. Finally, Serrato and Wingender (2016) estimates that the cost-per-job generated by a rise in federal transfers to US counties amounts to $ 30 000.[43]

The results for the mean wage are presented in Table 4, where the first stage estimates, on columns (3) and (5) of Table 4, and the respective F-tests of excluded instruments, show again that spending increases significantly in election years.

The fiscal multipliers, although positive and more sizeable than the OLS estimates, are not statistically significant. In practice, this means that local spending spikes do not lead to contemporaneous changes in the mean wage. It is reasonable that, anticipating downward wage rigidity, employers are reluctant to increase wages following a temporary shock, anticipating that they will not be able to decrease them subsequently, if needed.[44] In fact, according to Table 12 in Appendix C, if wages respond to spending changes, that effect is mostly for investment expenditure and with a one period lag, as the impact of *Lagged Investment Expenditure* in the mean wage is positive and statistically significant.

[43] Others studies identify higher figures for the cost of creating one job position, namely Wilson (2012) $125k/job or Dube et al. (2014), $120k/job, both in the US.

[44] Several studies document the high wage rigidities in the Portuguese labour market, namely as a result of the prohibition, by law, to reduce wages (downward wage rigidity). As Martins (2015) points out, based on survey data on Portuguese firms, downward wage rigidity constraints are less binding only for firms with a low fraction of permanent and high-skilled workers, particularly when the share of the flexible wage components is high.

Table 4: (mean) Wage Multipliers

	OLS		IV			
			1st St.	2nd St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)
Investment Expenditure	0.02***			0.10		
	[0.01]			[0.07]		
Current Expenditure		0.02				0.15
		[0.01]				[0.11]
D.local election			3.89***		2.53***	
			[0.51]		[0.44]	
Observations	7172	7172	7172	7172	7172	7172
R Sq.	0.08	0.08	0.13	-	0.28	-
F-stat	18.74	13.28	47.45	15.30	7.32	13.02
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
F-test excl.	-	-	56.35	-	32.03	-
p-value	-	-	0.0000	-	0.0000	-

Notes: Annual data at municipal level, between 1986 and 2014. Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year mean private-sector wage of full-time employees (Current Expenditure is defined analogously). Wage is the percentage change on the mean municipal private-sector wage of full-time employees (at least 140 paid hours/month). All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. Two lags of the spending and the outcome variable are also included. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using D.local election as an instrumental variable, which is equal to one in all local election years. Significance levels: * p<0.1, ** p<0.05, *** p<0.01

5.1 Including spending from years prior to local elections

Our identification strategy is based on the hypothesis that mayors increase local spending to increase electoral success. So far, we considered only the expenditure spikes that occur in the year of the election. However, Figure 4 suggests that at least some of the electoral motivated spending may occur in the year prior to the election.[45]

We include the effects of the year prior to the election by expanding our set of instrumental variables. Consequently our first stage equation becomes:

$$g_{t,i} = \alpha_i + \eta trend_{t,i} + \delta_1 D.local\_election_t + \delta_2 D.local\_election_{t-1} + \gamma X_{t,i} + v_{t,i}, \qquad (4)$$

where $D.local\_election_t$ is a dummy variable equal to one in all local election years (and zero otherwise) and $D.local\_election_{t-1}$ is a similar variable, equal to one in all years prior to an election episode. Consequently, δ_1 measures contemporaneous effect and δ_2 measures the lagged effect of local elections on our local spending variables. The remaining variables, as well as the

[45]The implementation of ambitious investment projects (building council housing, for instance) takes longer and so they may need to start in the year prior to the election.

second stage equation, defined by equation 3, remain the same.

Table 5 shows the first and second stage estimates for investment and current expenditure on the mean wages and on the number of full time workers. It is interesting to note that the F-test of excluded instruments is higher for investment expenditures, which is the spending item that is more likely to be enacted in the year before the election, as discussed above. This is confirmed by the coefficients of *D.local election (lag)*, which is higher for investment expenditures' changes (columns (1) and (5)). The F-tests of excluded instruments are above 10 for both the investment and current expenditure.

Table 5: Wage and Workers' Multipliers (including year prior to local election)

	Panel A: Mean Wage				Panel B: Workers			
	1st St.	2nd St.	1st St.	2nd St.	1st St.	2nd St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investment Expenditure		0.18**				0.91*		
		[0.07]				[0.48]		
Current Expenditure				0.28**				1.31*
				[0.13]				[0.69]
D.local election	4.30***		2.53***		1.52***		1.28***	
	[0.52]		[0.46]		[0.37]		[0.46]	
D.local election (lag)	1.00**		0.44*		0.65*		0.36***	
	[0.44]		[0.26]		[0.34]		[0.12]	
Obs.	7172	7172	7172	7172	7172	7172	7172	7172
R Sq.	0.033	-	0.006	-	0.051	-	0.001	-
F-stat	27.41	17.23	6.02	16.78	8.50	3.08	2.71	3.65
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0158	0.0196	0.0000
F-test excl.	32.44	-	14.23	-	8.12	-	5.28	-
p-value	0.0000	-	0.0000	-	0.0003	-	0.0053	-

Notes: Annual data at municipal level, between 1986 and 2014. Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year relevant outcome variable (mean private-sector wage or the number of full-time employees in the private sector). The outcome variables, Wage or Workers, are defined as the percentage change, in the municipality, of the outcome variables of interest. All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. One lag (2nd order) of the outcome and explanatory variables are also included (not shown). Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using D.local election and D.local election (lag) as instrumental variables, which are equal to one, respectively, in years of local elections and in years prior to local elections. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The inclusion of the year prior to the election reduces the power of our instruments for the employment specifications, as both for investment and current expenditures the F-test of excluded instruments is below 10. Even so, the implied multipliers are positive and statistically significant at the 10% level. Employment multipliers are slightly lower (between 0.9 and 1.3) than in the baseline specification.

Including the effect of previous year expenditure generates a positive and statistically significant effect on the mean wage. This suggests that wages may take longer to adjust than employment,

although we interpret this result with caution, given the rigidity of the wages documented in previous literature. It may be that these results are driven by the creation of better paid jobs or by the variable components of the wage. The small magnitude of the impact – an increase of 1% of local spending, scaled by the lagged mean wage, leads to a boost of the mean wage between 0.2% and 0.3% – confirms our cautious interpretation of the result.

6 State-Dependent Multipliers

The literature about state-dependent fiscal multipliers takes advantage of diverse economic conditions to estimate heterogeneous fiscal multipliers, e.g., depending on the business cycle (Caggiano et al., 2015), for countercyclical spending in recessions (Riera-Crichton et al., 2015), in recession periods associated with banking stress or weak public finances (Hernández de Cos and Moral-Benito, 2016), or near the zero lower bound (Ramey and Zubairy, 2018). (Ilzetzki et al., 2013) expanded the heterogeneity dimensions to include the level of debt, the exchange rate regime or the level of development of the country.[46] Evidence of state-dependence at subnational level is more scarce. Nakamura and Steinsson (2014), for instance, show that subnational spending multipliers are higher in periods of national and state-level economic slack (measured by unemployment).

In the next sections we *i)* discuss the effects of municipality size on the fiscal multipliers and *ii)* assess whether the local political cycle affects both the spending spikes and the local output effects. Having established that our results are driven by local employment, we focus on the number of workers as the outcome variable of interest.

6.1 Are multipliers affected by the size of the municipality?

The size of the municipality is likely to affect the value of the local fiscal multipliers. Bigger municipalities have more dynamic labour markets and financial resources of such municipalities are also potentially higher. Moreover, the potential scope for large spikes in investment expenditure is also higher, as repairing a central avenue in a big city is most likely more expensive

[46] Parker (2011) provides a discussion about the need and relevance of reflecting the economic cycle in the estimation of fiscal multipliers.

than doing a similar repair in a small village.

An obvious way of assessing heterogenous effects of local spending in municipalities of different sizes is run the baseline regressions discussed in the last section for samples restricted on population quartiles. As the overall population level does not change very expressively during the period of our analysis, we compute population quartiles using the whole sample. Therefore, for each outcome variable, we run four separate regressions, using the same baseline specification, except for the inclusion of population weighting in the estimation procedure. We estimate the multipliers for municipalities that lie between the 3 quartiles: Q_1=8119, Q_2=16 097 and Q_3=37 438.

Table 6 shows the effects of local spending on the number of full time workers in the municipality. The effects are more sizeable as the population level increases. Increasing investment expenditure by 1% leads to an increase of 7.64% of municipal employment in the top quartile, which corresponds to a cost-per-job of €13 025, while for current expenditure this figure amounts to €8 469, for the average municipality in this quartile.[47]

Table 6: Workers' Multipliers, by population level.

	$pop. \leq Q_1$		$Q_1 < pop. \leq Q2$		$Q_2 < pop. \leq Q_3$		$pop. > Q_3$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investment Expenditure	0.21*		0.04		1.76**		7.64*	
	[0.12]		[0.17]		[0.86]		[4.04]	
Current Expenditure		0.54**		0.03		1.84**		11.75*
		[0.26]		[0.11]		[0.77]		[6.33]
Obs.	1845	1845	1768	1768	1756	1756	1803	1803
F-stat	5.45	4.74	2.30	2.15	3.42	5.89	1.81	1.76
p-value	0.0001	0.0003	0.0438	0.0582	0.0047	0.0000	0.1091	0.1183
F-test excl.	6.86	9.91	12.25	2.35	9.70	32.98	19.82	30.73
p-value	0.0091	0.0018	0.0005	0.1255	0.0019	0.0000	0.0000	0.0000

Notes: Annual data at municipal level, between 1986 and 2014. The estimation procedure and the definition of all variables used are analogous to the one implemented in Table 3, except for the fact that regressions are not population weighted. Population quartiles were determined for the whole sample and are such that Q_1=8119, Q_2=16097 and Q_3=37438. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The multiplier is significantly higher than the one obtained in our baseline estimates in the last quartile and substantially smaller in the first quartile. This shows that in bigger municipalities local spending is able to affect the local economy more sizeably.

These findings could be a consequence of two issues. On one hand, smaller municipalities are

[47]The cost-per-job is obtained by dividing the average population level, for the municipalities above the third quartile (99512 inhabitants), by the value of the multiplier obtained in Table 6.

likely to have scarcer resources and so they cannot increase local spending enough so that there is a significant impact on the private sector labour market.[48] On the other hand, smaller municipalities typically have less resident companies and so the Town Council may need to hire companies in neighbouring municipalities to undertake the projects.[49]

For reference, we also report in Appendix D.1 the estimates, by population level, for the wage bill and the mean wage. Table 14 shows that both the wage bill multipliers and the relevance of our instrument (evaluated by the F-test of excluded instruments) increase as population increases. The effects over the wage bill are more visible above the median municipality, population wise. For municipalities above the third quartile an increase of spending, scaled by the per capita wage bill, of 1% increases the municipal wage expenditure by 0.14% for investment expenditures and 0.25% for current expenditure. These results are higher than the ones implied by our baseline estimates. The findings for the mean wage, in Table 15, are similar, although the effects over the mean wage are still not significant across all the population quartiles.

Tables 16 to 18, in Appendix D.1, provide further support to these results. In each table we calculate the multipliers for each of our outcome variables, by restricting the sample to the municipalities that have cities and coastal municipalities.[50] These work as two alternative measures of the size of the municipality. Overall, the results are similar.

6.2 Political Stance

We now analyse the extent to which mayors with higher political capital, as proxied by the number of terms in office, give rise to differences in spending, and whether this translates into heterogenous effects on the local economic activity. In this section, we do so by re-estimating our baseline models using interactions.

Since Besley and Case (1995), much has be written about the consequences of term limits for accountability and their impact on governance. Smart and Sturm (2013) use a theoretical model

[48] To illustrate, the average investment per capita in municipalities in the first quartile of the population is €148 while for the municipalities above the third quartile the figure amounts to €425.

[49] The average number of firms in municipalities in the first quartile is 131, municipalities above the third quartile have, on average 2466 firms.

[50] According to Law 11/82, a village can be classified as a city if it has at least 8000 inhabitants and if it possesses certain collective structures like hospitals, cultural centres, schools (at least up to the secondary level) and public transportation, among others.

to discuss how term limits induce politicians to implement their preferred policies and can thus improve the voters' information about them. Leguizamon and Crowley (2016), in turn, discusses that the reduction of accountability due to the existence of term limits suggested by Besley and Case (1995) may be mitigated by the prospects of future careers outside mayoral office for these incumbents. Klein and Sakurai (2015) show that first-terms mayors in Brazil (not term-limited) reduce local taxes and shift spending from current to capital items in election years, to boost the probability of being reelected. Alt et al. (2011), exploiting variation in US gubernatorial term limits, argues that the effects of term limits vary on essentially two dimensions: accountability (that makes term-limited mayors less worried about voters' welfare) and competence (that makes more experienced mayors, more efficient policy makers).[51]

Term limits for mayors – a maximum of three consecutive terms – were introduced in Portugal in 2005, but only became binding in the 2013 election. Lopes da Fonseca (2016) shows that term limited mayors in Portugal are more fiscally conservative, in that they set lower tax rates and spend less than their counterparts who can be up for reelection.[52]

In Table 7 we investigate the heterogenous effects of local spending multipliers for mayors that have been in power for at least 3 terms.[53] We define the threshold at 3 terms because the average number of terms in our sample is 2.5 (ranging from 1 to 10) and because, in that way, we can provide some rationale to the limit imposed by the Law 46/2005.

[51] Dalle Nogare and Ricciuti (2011) surveys the literature about term limits, and shows that there is evidence of different behaviour of term-limited central governments, for a panel of 52 countries.

[52] Also in Portugal, Veiga and Veiga (2018) show that term-limits increase voter turnout in local Portuguese municipalities.

[53] D.high terms is equal to one whenever number of terms>3.

Table 7: Workers' Multipliers, for municipalities with the same mayor for more than 3 terms.

	Panel A: Workers and Inv. Exp.			Panel B: Workers and Cur. Exp.		
	1st St.	1st St.	2nd St.	1st St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)
Investment Expenditure			1.63**			
			[0.72]			
D.high terms × Investment Expenditure			-0.28			
			[0.82]			
Current Expenditure						3.02**
						[1.24]
D.high terms × Current Expenditure						-2.21*
						[1.24]
D.high terms	0.36	0.10	-0.89	0.51	1.06***	0.47
	[0.36]	[0.29]	[0.65]	[0.37]	[0.36]	[0.99]
D.local elections	1.25***	0.17		0.85***	0.27	
	[0.32]	[0.11]		[0.24]	[0.18]	
D.high terms × D.local elections	0.16	1.14**		1.15	1.59*	
	[0.50]	[0.47]		[0.88]	[0.88]	
Obs.	7172	7172	7172	7172	7172	7172
R Sq.	0.09	0.02	-	0.29	0.00	-
F-stat	5.90	3.28	2.29	4.19	2.87	2.86
p-value	0.0000	0.0019	0.0257	0.0002	0.0059	0.0061
F-test excl.	7.53	3.40	-	6.41	1.54	-
p-value	0.0006	0.0339	-	0.0017	0.2151	-

Notes: Annual data at municipal level, between 1986 and 2014. Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year number of workers. The outcome variable is the percentage change of the number of Workers, in the municipality. All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using D.localelection and D.high terms × D.local election as instrumental variables. The former is equal to one in all election years and the latter is an interaction term, equal to one for all municipalities whose mayor, in election years, is in power for more than 3 terms. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Both the coefficients of D.high terms and of the interaction variable suggest that mayors that have been in power for long spend more than mayors in earlier terms, although the effects are not statistically significant (shown in columns 1 and 4).

Moreover, the economic effect of spending is smaller for experienced mayors, particularly for current expenditures. The fiscal multiplier is 3.02% for municipalities with mayors between the first and the third terms. From the fourth term onwards, the employment multipliers reduces to 0.81% (3.02-2.21), which is smaller than the 1.71% linear multiplier shown in Table 3. This figure implies a cost-of-job created of €43 400.

7 Conclusions

This paper uses a novel instrument to identify exogenous local spending shocks and estimate local fiscal multipliers. We take advantage of the opportunistic behaviour of politicians in electoral

periods and instrument exogenous changes in local spending using a dummy variable for the election year to capture electorally motivated expenditure.

Local elections in Portugal are scheduled by the central government and take place in fixed four-year intervals and are, as such, exogenous to local policy makers. To establish that elections are not *per se* a shock to local output, we investigate the logistics and financials of local elections. We show that election episodes entail administrative and campaign costs which represent a negligible share of 0.04% of GDP. Administrative costs are supported mostly by the municipalities and campaign costs by political parties. Typically costs materialise in the campaign period, two weeks prior to the election day. Therefore, it is unlikely that the direct cost of electoral episodes represents a shock to local output which makes us confident about the validity of the instrument.

Using a rich panel dataset with detailed information on municipal level expenditure and revenue, we analyse two expenditure items (local investment in fixed assets and current expenditure) and conclude that the former is more prone to political business cycles. We then compute local fiscal multipliers of municipal spending on three local outcome variables of interest: the total wage expenditure of full time workers in the private sector (wage bill), the mean wage of private sector workers and the total number of full-time workers in the municipality. Overall, we find that local expenditure shocks in electoral years lead to contemporaneous increase in both the wage bill (around 0.1%) and in the number of workers (between 1.5 and 1.7%). The municipal mean wage is more rigid and, if anything, responds with a one period lag, with a small effect that ranges from 0.4 to 0.6%. These results are robust to different specifications and to the inclusion of the year prior to election as an additional instrument.

We also evaluate the sensitivity of multipliers to different demographic, and political contexts. We show that multipliers are higher for bigger municipalities and find evidence that mayors in power for longer periods tend to produce spending (particularly current) that has smaller effects on the local economic activity.

The main contributions of this paper are to provide a new identification strategy and to add to the literature on state-dependent multipliers by investigating previously unexplored dimensions of heterogeneity. Our approach could be replicated virtually to all countries where subnational, exogenously set elections occur, thus providing the ideal tool to perform cross-country evaluation

of local fiscal multipliers. This could improve our knowledge about the transmission mechanisms of local fiscal policy and provide an important tool for comparative analysis.

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Appendices

A Data

Figure 6: Decomposition of Investment expenditure per capita (national average)

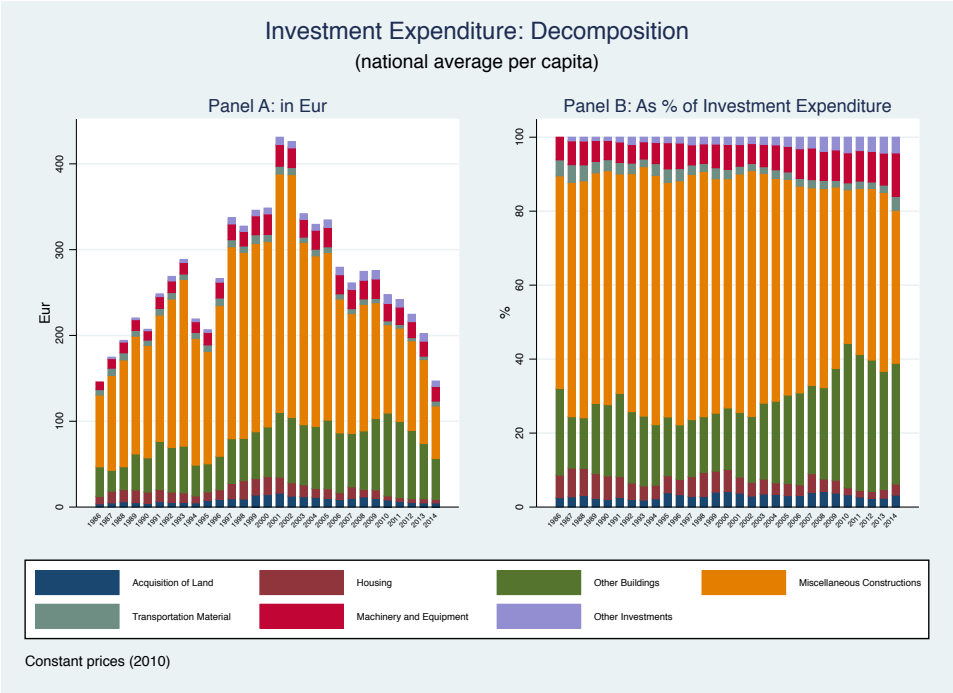

Figure 7: Local Output Measures vs. GDP - changes

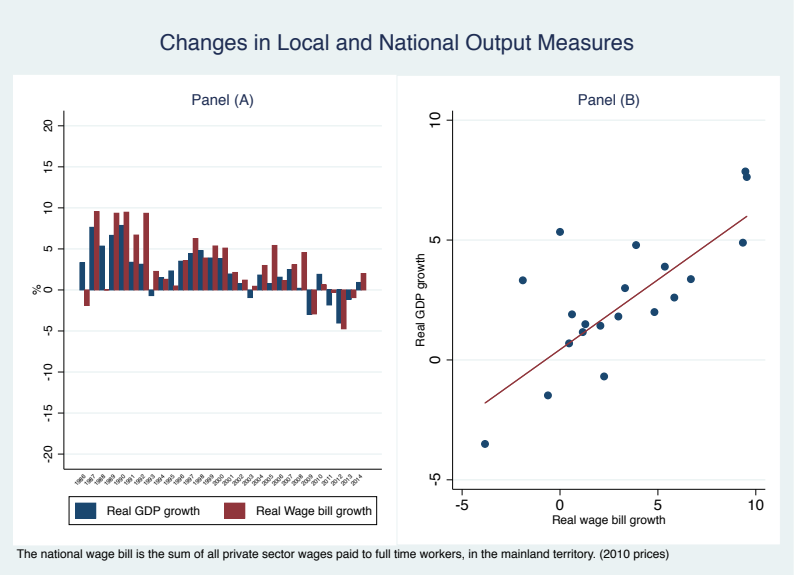

Figure 8: Correlation between changes in the mean wage and spending variables

Figure 9: Correlation between changes in the number of workers and spending variables

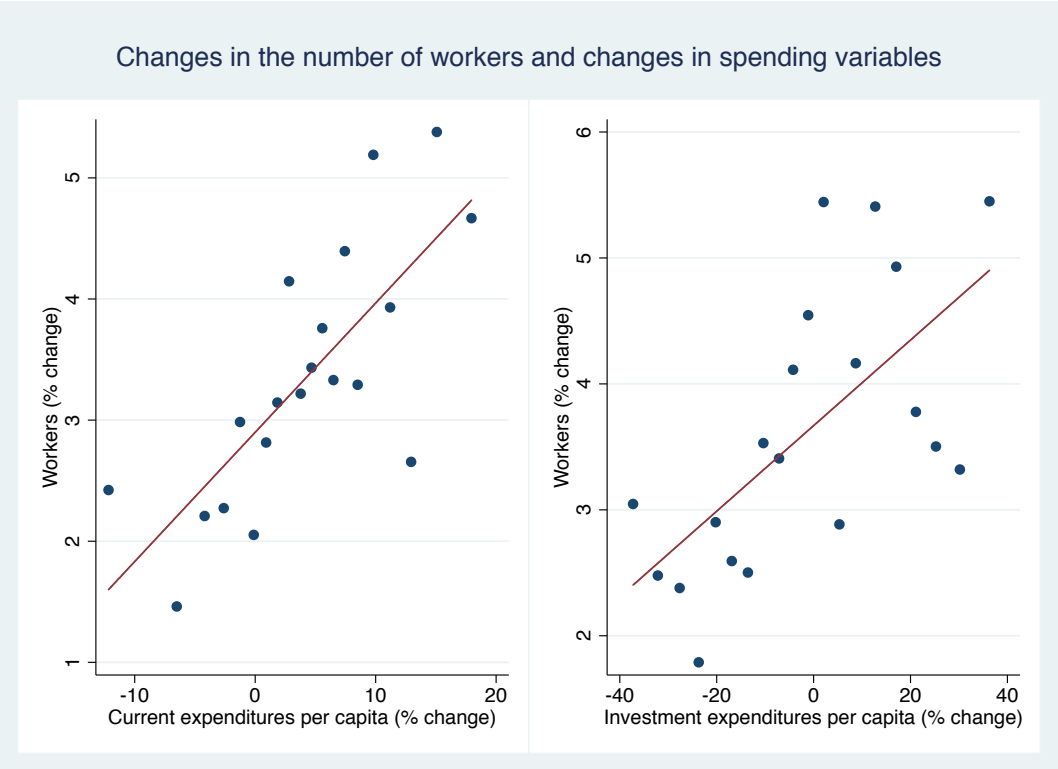

Table 8: Descriptive Statistics

	Obs.	Mean	S.D.	Min.	Max.
Panel A: Local Finance - Revenue (in millions)					
Total Revenue	6 649	23.51	45.94	0.5	854.7
Current Revenue	6 649	16.04	35.1	0.5	572
Current Transfers	6 649	5.57	5.3	0.5	82.4
Direct Taxes	6 649	6.52	21.13	0	361.1
Indirect Taxes	6 651	0.66	2.63	-0.1	60
Sales (Goods/Services)	6 649	1.79	4.32	0	82.5
Property Income	6 649	0.55	1.37	0	31.9
Fees/Fines	6 649	0.69	2.91	0	83.5
Capital Revenue	6 651	7.46	12.85	0	352.4
Capital Transfers	6 651	4.98	4.98	0	125.3
Sales (Durable goods)	6 376	0.57	3.89	0	164.6
Other Capital Revenue	6 651	1.91	7	0	282.6
Panel B: Local Finance - Expenditures (in millions)					
Total Expenditure	6 649	23.42	45.94	0.4	843.8
Current Expenditure	6 651	13.57	28.65	0	494.7
Payroll	6 651	6.5	15.95	0	310.4
Purchases (goods/services)	6 651	4.66	8.19	0	129.9
Current Transfers	6 651	1.48	3.27	0	68.3
Financial Expenditure	6 651	0.44	1.04	0	30.3
Other Current Expenditure	6 651	0.51	1.79	0	31.8
Capital Expenditure	6 649	9.85	18.44	0.3	437.5
Investment Expenditure	6 651	6.64	12.92	0	320.6
Other Capital Expenditure	6 649	3.2	8.41	-80.4	373.7
Panel C: Local Finance - Investment Expenditure Breakdown (in millions)					
Land	6 600	0.32	1.39	0	71.1
Housing	6 600	0.65	4.6	0	160.1
Other Buildings	6 600	1.59	2.99	0	61.4
Miscellaneous Constructions	6 600	3.33	5.24	0	135.6
Transportation Material	6 651	0.14	0.3	0	9.3
Machinery/Equipments	6 651	0.46	0.96	0	26.8
Other Investment Expenditures	6 651	0.16	0.67	0	23.8
Panel D: Macroeconomic Fundamentals					
Unemployment Rate	6 673	7.75	3.53	3.9	16.2
National Budget Deficit	6 673	-6831.67	2980.37	-14239.8	-2686.9
GDP Growth (Real)	6 673	1.31	2.27	-4	4.8
Private Consumption (% of GDP)	6 673	64.57	1.15	62.6	66.3

Continued on next page

Table 8: Descriptive Statistics

	Obs.	Mean	S.D.	Min.	Max.
Public Consumption (% of GDP)	6 673	19.02	1.31	16.9	21.4
Gross Fixed Capital Formation (% of GDP)	6 673	23.1	3.84	14.8	28
Panel E: Demographics and Economic Municipal Variables					
Population density	6 669	3.05	8.73	0	79.1
Share of population 65+	6 669	21.38	6.68	6.7	45
Number of Firms	6 370	920.11	1933.41	10	29710
Average Wage	6 370	829.35	168.57	477.3	2301.4
Number of Workers	6 370	9312.44	25844.16	79	419690
Panel F: Political Variables					
Local Election (=1)	6 673	0.25	0.43	0	1
General Election (=1)	6 673	0.29	0.45	0	1
Majority: Town Council (=1)	6 639	0.85	0.36	0	1
Majority: Municipal Assembly (=1)	6 636	0.64	0.48	0	1
Majority: Town Council and Mun. Assembly (=1)	6 639	0.63	0.48	0	1
Right-wing Mayor (=1)	6 639	0.44	0.5	0	1
Incumbent running for reelection (=1)	6 651	0.69	0.46	0	1
Number of terms Mayor has been in power (=1)	6 639	2.58	1.7	1	10
Same Winning Party (=1)	6 626	0.73	0.44	0	1

Monetary values in constant prices (2010), shares in a scale of 0-100.

B Identification

Table 9: Differences in means of spending variables: election vs non-election years.

	Levels			Changes		
	Election	No Election	diff.	Election	No-election	diff.
Investment Expenditure[1]	€297.35	€259.45	€37.9***	18.64%	8.29%	12.8%***
Current Expenditure[1]	€484.71	€442.40	€42.31**	9.34%	5.97%	3.37%***
Obs.	1937	6082	-	1937	6082	-

Notes: Spending variables in per capita terms. Test of difference in means, comparing spending in election and non election years, where the significance reported tests H_0: diff<0. Significance levels: * p<0.05, ** p<0.01, *** p<0.001

Figure 10: Campaign Spending of main candidates in Portuguese Elections

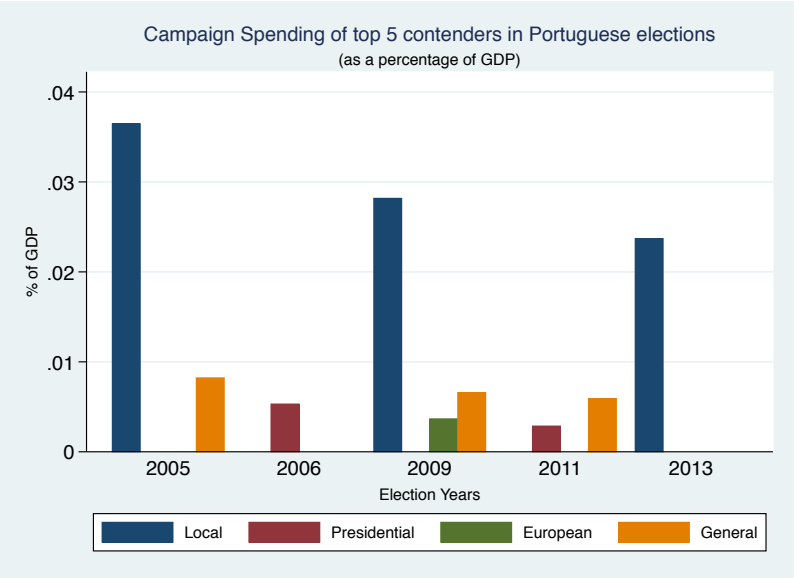

Table 10: Campaigning costs and revenues in local elections.

Party	Costs	Revenues			
	Total Cost	Party Contribution	Public Funding	Private Donations	Total Revenue
2005 Election					
BE	€1 672 981.84	€120 993.79	€1 525 677.74	€28 254.84	€1 674 926.37
PS	€24 026 933.57	€762 676.36	€17 824 684.08	€5 210 029.92	€23 797 390.36
PCP	€4 698 723.27	€293 015.94	€4 254 649.89	€104 428.64	€4 652 094.46
CDS	€3 041 430.92	€700 662.48	€2 356 188.59	€107 482.26	€3 164 333.33
PSD	€28 856 980.80	€7 886 843.62	€13 398 510.41	€4 699 869.10	€25 985 223.13
Coalitions' Total	€1 342 915.80	€2 214 982.55	€0.00	€842 885.64	€3 057 868.19
Total	€63 639 966.21	€11 979 174.74	€39 359 710.70	€10 992 950.39	€62 331 835.83
2009 Election					
BE	€1 329 778.77	€1 246 370.53	€1 137 090.01	€310 768.37	€2 694 228.91
PS	€24 230 903.15	€7 569 295.68	€18 809 219.14	€2 746 030.77	€29 124 545.58
PCP	€4 805 495.73	€4 705 290.97	€4 420 731.46	€92 125.87	€9 218 148.30
CDS	€1 789 444.85	€1 767 099.10	€1 539 279.84	€22 345.74	€3 328 724.69
PSD	€11 863 141.38	€1 698 618.34	€9 367 376.79	€797 146.26	€11 863 141.39
Coalitions' Total	€5 737 071.70	€875 429.43	€4 537 367.54	€324 274.72	€5 737 071.69

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Table 10: Campaigning costs and revenues in local elections.

Party	Costs	Revenues			
	Total Cost	Party Contribution	Public Funding	Private Donations	Total Revenue
Total	€49 755 835.57	€17 862 104.05	€39 811 064.78	€4 292 691.72	€61 965 860.55
2013 Election					
BE	€1 161 830.92	€230 081.02	€883 650.18	€52 409.06	€1 166 140.27
PS	€19 199 997.20	€417 098.59	€16 808 357.21	€1 403 091.36	€18 628 547.16
PCP	€4 269 663.83	€2 236 064.66	€4 064 301.99	€60 321.36	€6 360 688.00
CDS	€1 495 742.75	€1 188 779.48	€1 193 235.89	€98 939.26	€2 480 954.63
PSD	€7 138 145.67	€1 385 979.62	€4 867 601.80	€863 751.59	€7 117 333.00
Coalitions' Total	€6 458 889.77	€1 986 305.34	€4 018 579.32	€562 357.50	€6 567 242.15
Total	€39 724 270.14	€7 444 308.71	€31 835 726.39	€3 040 870.12	€42 320 905.22

Notes: Values in constant prices (2010), the data was obtained from the parties' reports on campaign spending and revenue, submitted and audited by the Portuguese Constitutional Court.

C Baseline estimates of Fiscal Multiplier

Table 11: Wage Bill Multipliers

	OLS		IV			
			1st St.	2nd St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)
Investment Expenditure	0.00**			0.09***		
	[0.00]			[0.02]		
Current Expenditure		0.00				0.12***
		[0.00]				[0.04]
Investment Expenditure (1st lag)	0.00**		-0.14**	0.01**		
	[0.00]		[0.07]	[0.01]		
Investment Expenditure (2nd lag)	0.00		-0.17***	0.02**		
	[0.00]		[0.06]	[0.01]		
Current Expenditure (1st lag)		0.00**			-0.61**	0.08**
		[0.00]			[0.26]	[0.03]
Current Expenditure (2nd lag)		0.00			-0.29	0.04
		[0.00]			[0.22]	[0.03]
Wage bill (1st lag)	-0.15***	-0.15***	0.14	-0.17***	0.22	-0.19***
	[0.04]	[0.04]	[0.19]	[0.04]	[0.14]	[0.04]
Wage bill (2nd lag)	-0.03	-0.03	-0.04	-0.02	0.15	-0.04
	[0.05]	[0.05]	[0.21]	[0.05]	[0.12]	[0.05]
D. local election			30.94***		22.89***	
			[4.66]		[5.18]	
Obs.	7172	7172	7172	7172	7172	7172
R Sq.	0.02	0.02	0.05	-	0.29	-
F-stat	4.12	3.73	11.89	6.18	5.49	6.34
p-value	0.0011	0.0024	0.0000	0.0000	0.0001	0.0000
F-test excl.	-	-	42.14	-	18.72	-
p-value	-	-	0.0000	-	0.0000	-

Notes: Annual data at municipal level, between 1986 and 2014. Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year private-sector wage bill (Current Expenditure is defined analogously). The Wage bill is the percentage change on the per-capita municipal expenditure in private-sector wages of full-time employees (at least 140 paid hours/month). All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. Two lags of the spending and the outcome variable are also included. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using D.local election as an instrumental variable, which is equal to one in all local election years. Significance levels: * p<0.1, ** p<0.05, *** p<0.01

Table 12: Wage Multipliers

	OLS		IV			
			1st St.	2nd St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)
Investment Expenditure	0.02***			0.10		
	[0.01]			[0.07]		
Current Expenditure		0.02				0.15
		[0.01]				[0.11]
Investment Expenditure (1st lag)	0.03***		-0.32***	0.05**		
	[0.01]		[0.03]	[0.02]		
Investment Expenditure (2nd lag)	0.00		-0.21***	0.02		
	[0.01]		[0.02]	[0.02]		
Current Expenditure (1st lag)		0.02**			-0.61***	0.10
		[0.01]			[0.23]	[0.07]
Current Expenditure (2nd lag)		0.01			-0.29	0.05
		[0.01]			[0.19]	[0.04]
Wage (1st lag)	-0.26***	-0.26***	0.04	-0.27***	0.02	-0.27***
	[0.03]	[0.03]	[0.03]	[0.04]	[0.02]	[0.04]
Wage (2nd lag)	-0.18***	-0.18***	-0.03	-0.18***	0.02	-0.18***
	[0.03]	[0.03]	[0.03]	[0.03]	[0.02]	[0.03]
D.local election			3.89***		2.53***	
			[0.51]		[0.44]	
Obs.	7172	7172	7172	7172	7172	7172
R Sq.	0.08	0.08	0.13	-	0.28	-
F-stat	18.74	13.28	47.45	15.30	7.32	13.02
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
F-test excl.	-	-	56.35	-	32.03	-
p-value	-	-	0.0000	-	0.0000	-

Notes: Annual data at municipal level, between 1986 and 2014. Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year mean private-sector wage of full-time employees (Current Expenditure is defined analogously). Wage is the percentage change on the mean municipal private-sector wage of full-time employees (at least 140 paid hours/month). All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. Two lags of the spending and the outcome variable are also included. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using D.local election as an instrumental variable, which is equal to one in all local election years. Significance levels: * p<0.1, ** p<0.05, *** p<0.01

Table 13: Workers' Multipliers

	OLS		IV			
			1st St.	2nd St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)
Investment Expenditure	0.01			1.50**		
	[0.01]			[0.64]		
Current Expenditure		0.01				1.71**
		[0.01]				[0.83]
Investment Expenditure (1st lag)	0.01		-0.15*	0.23		
	[0.01]		[0.08]	[0.15]		
Investment Expenditure (2nd lag)	0.01*		-0.24***	0.37*		
	[0.01]		[0.07]	[0.20]		
Current Expenditure (1st lag)		0.01*			-0.59**	1.01
		[0.01]			[0.26]	[0.63]
Current Expenditure (2nd lag)		0.01*			-0.27	0.48
		[0.01]			[0.21]	[0.42]
Workers (1st lag)	-0.17***	-0.17***	0.03	-0.21***	0.02*	-0.21***
	[0.06]	[0.06]	[0.02]	[0.07]	[0.01]	[0.06]
Workers (2nd lag)	0.03	0.03	0.00	0.03	0.01	0.01
	[0.07]	[0.07]	[0.02]	[0.08]	[0.01]	[0.07]
D.local election			1.30***		1.14***	
			[0.35]		[0.42]	
Obs.	7172	7172	7172	7172	7172	7172
R Sq.	0.03	0.03	0.07	-	0.27	-
F-stat	2.68	2.48	7.09	2.44	3.64	3.01
p-value	0.0205	0.0305	0.0000	0.0330	0.0029	0.0107
F-test excl.	-	-	13.41	-	6.99	-
p-value	-	-	0.0003	-	0.0084	-

Notes: Annual data at municipal level, between 1986 and 2014. Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year total number of full-time private-sector workers in the municipality (Current expenditure is defined analogously). Workers is the percentage change on the total number of full-time (at least 140 paid hours/month) private-sector workers in the municipality. All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. Two lags of the spending and the outcome variable are also included. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using D.local election as an instrumental variable, which is equal to one in all local election years. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

D State dependent multipliers

D.1 Municipal size-related heterogeneity

Table 14: Wage bill Multipliers, by population level.

	$pop. \leq Q_1$		$Q_1 < pop. \leq Q2$		$Q_2 < pop. \leq Q_3$		$pop. > Q_3$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investment Expenditure	0.03*		0.00		0.05*		0.14***	
	[0.02]		[0.01]		[0.03]		[0.05]	
Current Expenditure		0.07**		0.00		0.06*		0.25***
		[0.03]		[0.01]		[0.03]		[0.08]
Obs.	1845	1845	1768	1768	1756	1756	1803	1803
F-stat	5.59	6.13	4.80	4.84	3.49	4.64	2.80	2.67
p-value	0.0001	0.0000	0.0003	0.0002	0.0040	0.0004	0.0166	0.0211
F-test excl.	5.57	15.86	12.35	3.03	11.54	43.63	32.25	39.41
p-value	0.0187	0.0001	0.0005	0.0825	0.0007	0.0000	0.0000	0.0000

Notes: Annual data at municipal level, between 1986 and 2014. The estimation procedure and the definition of all variables used are analogous to the one implemented in Table 2, except for the fact that regressions are not population weighted. Population quartiles were determined for the whole sample and are such that Q_1=8119, Q_2=16097 and Q_3=37438. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 15: Wage Multipliers, by population level.

	$pop. \leq Q_1$		$Q_1 < pop. \leq Q2$		$Q_2 < pop. \leq Q_3$		$pop. > Q_3$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investment Expenditure	-0.05		0.00		-0.08		0.08	
	[0.12]		[0.07]		[0.10]		[0.08]	
Current Expenditure		-0.09		0.00		-0.11		0.14
		[0.21]		[0.06]		[0.13]		[0.13]
Obs.	1845	1845	1768	1768	1756	1756	1803	1803
F-stat	15.45	15.34	6.79	6.70	8.73	8.50	7.41	6.89
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
F-test excl.	4.65	11.43	24.91	3.42	14.18	32.87	36.49	41.80
p-value	0.0315	0.0008	0.0000	0.0648	0.0002	0.0000	0.0000	0.0000

Notes: Annual data at municipal level, between 1986 and 2014. The estimation procedure and the definition of all variables used are analogous to the one implemented in Table 4, except for the fact that regressions are not population weighted. Population quartiles were determined for the whole sample and are such that Q_1=8119, Q_2=16097 and Q_3=37438. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16: Wage bill Multipliers, in cities and coastal municipalities.

	Cities				Coastal			
	1st St.	2nd St.	1st St.	2nd St.	1st St.	2nd St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investment Expenditure		0.14***				0.09***		
		[0.04]				[0.03]		
Current Expenditure				0.16***				0.26***
				[0.06]				[0.10]
Investment Expenditure (1st lag)	-0.30***	0.04***			-0.31***	0.03***		
	[0.06]	[0.01]			[0.06]	[0.01]		
Investment Expenditure (2nd lag)	-0.21***	0.03***			-0.18***	0.02***		
	[0.04]	[0.01]			[0.03]	[0.01]		
Current Expenditure (1st lag)			-0.67**	0.11**			-0.27***	0.09**
			[0.27]	[0.05]			[0.09]	[0.04]
Current Expenditure (2nd lag)			-0.34	0.05			0.02	0.02
			[0.27]	[0.04]			[0.05]	[0.01]
Wage bill (1st lag)	0.31**	-0.24***	0.34**	-0.25***	-0.01	-0.08	0.02	-0.09**
	[0.13]	[0.07]	[0.15]	[0.06]	[0.30]	[0.05]	[0.09]	[0.05]
Wage bill (2nd lag)	0.27	-0.06	0.41**	-0.09	0.25	-0.13**	0.10	-0.14***
	[0.16]	[0.07]	[0.17]	[0.09]	[0.33]	[0.05]	[0.08]	[0.04]
D.local election	23.09***		20.63***		28.91***		9.56***	
	[3.33]		[6.52]		[4.56]		[3.41]	
Obs.	2736	2736	2736	2736	1531	1531	1531	1531
R Sq.	0.123	-	0.329	-	0.142	-	0.065	-
F-stat	19.02	4.13	2.77	4.96	16.13	3.70	5.06	3.85
p-value	0.0000	0.0010	0.0175	0.0002	0.0000	0.0028	0.0002	0.0021
F-test excl.	-	45.93	-	9.54	-	38.00	-	7.44
p-value	-	0.0000	-	0.0021	-	0.0000	-	0.0067

Notes: Annual data at municipal level, between 1986 and 2014. The sample is restricted, in left panel, to municipalities that have cities (according to the 2001 definition, which establishes 144 cities in a total of 121 municipalities) and in the right panel, to municipalities that have a border with the ocean (59 municipalities). Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year mean private-sector wage (Current Expenditure is defined analogously). Wage is the percentage change on the mean municipal private-sector wage. All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using D.local election as an instrumental variable, which is equal to one in all local election years. Significance levels: * p<0.1, ** p<0.05, *** p<0.01

Table 17: Workers' Multipliers in Coastal Municipalities and Cities.

	Cities				Coastal			
	1st St.	2nd St.	1st St.	2nd St.	1st St.	2nd St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investment Expenditure		6.46**				2.25***		
		[2.77]				[0.84]		
Current Expenditure				2.16				9.28***
				[1.39]				[3.54]
Investment Expenditure (1st lag)	-0.27***	1.73**			-0.36***	0.88**		
	[0.08]	[0.86]			[0.13]	[0.37]		
Investment Expenditure (2nd lag)	-0.22***	1.32*			-0.25***	0.66***		
	[0.05]	[0.69]			[0.07]	[0.25]		
Current Expenditure (1st lag)			-0.68**	1.46			-0.07	0.83
			[0.27]	[1.08]			[0.10]	[0.93]
Current Expenditure (2nd lag)			-0.34	0.74			0.22***	-1.47
			[0.28]	[0.75]			[0.08]	[0.93]
Workers (1st lag)	0.01	-0.28**	0.01	-0.27**	-0.06	0.11	-0.01	0.04
	[0.01]	[0.12]	[0.02]	[0.11]	[0.04]	[0.09]	[0.01]	[0.07]
Workers (2nd lag)	0.00	0.03	0.03	-0.00	0.07	-0.19	0.01	-0.11*
	[0.00]	[0.11]	[0.02]	[0.13]	[0.06]	[0.12]	[0.00]	[0.06]
D.local election	0.32***		0.97*		0.91***		0.21***	
	[0.08]		[0.53]		[0.24]		[0.06]	
Obs.	2736	2736	2736	2736	1531	1531	1531	1531
R Sq.	0.092	-	0.335	-	0.198	-	0.056	-
F-stat	7.10	2.01	2.33	1.84	5.81	1.85	3.75	1.60
p-value	0.0000	0.0748	0.0411	0.1030	0.0000	0.1032	0.0026	0.1593
F-test excl.	-	14.86	-	3.18	-	13.23	-	11.22
p-value	-	0.0001	-	0.0752	-	0.0003	-	0.0009

Notes: Annual data at municipal level, between 1986 and 2014. The sample is restricted, in left panel, to municipalities that have cities (according to the 2001 definition, which establishes 144 cities in a total of 121 municipalities) and in the right panel, to municipalities that have a border with the ocean (59 municipalities). Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year total number of full-time private-sector workers in the municipality (Current Expenditure is defined analogously). Workers is the percentage change on the total number of full-time private-sector workers in the municipality. All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using $D.local\_election$ as an instrumental variable, which is equal to one in all local election years. Significance levels: * p<0.1, ** p<0.05, *** p<0.01

Table 18: Wage Multipliers in Coastal Municipalities and Cities.

	Cities				Coastal			
	1st St.	2nd St.	1st St.	2nd St.	1st St.	2nd St.	1st St.	2nd St.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investment Expenditure		0.14*				0.12		
		[0.08]				[0.09]		
Current Expenditure				0.20				0.25
				[0.12]				[0.23]
Investment Expenditure (1st lag)	-0.31***	0.08***			-0.27***	0.05**		
	[0.05]	[0.03]			[0.04]	[0.03]		
Investment Expenditure (2nd lag)	-0.17***	0.03*			-0.16***	0.01		
	[0.03]	[0.02]			[0.03]	[0.02]		
Current Expenditure (1st lag)			-0.63***	0.14			-0.41***	0.16
			[0.24]	[0.09]			[0.09]	[0.10]
Current Expenditure (2nd lag)			-0.31	0.07			-0.11**	0.09**
			[0.22]	[0.06]			[0.05]	[0.04]
Wage (1st lag)	0.06*	-0.30***	0.02	-0.29***	0.02	-0.22***	0.02	-0.23***
	[0.04]	[0.05]	[0.03]	[0.05]	[0.04]	[0.05]	[0.02]	[0.05]
Wage (2nd lag)	-0.01	-0.22***	0.03	-0.22***	-0.01	-0.20***	-0.02	-0.20***
	[0.03]	[0.05]	[0.03]	[0.04]	[0.04]	[0.06]	[0.02]	[0.06]
D.local election	3.90***		2.68***		4.41***		1.82***	
	[0.53]		[0.56]		[0.69]		[0.55]	
Obs.	2736	2736	2736	2736	1531	1531	1531	1531
R Sq.	0.199	-	0.307	-	0.209	-	0.203	-
F-stat	2.56	8.09	2.44	7.67	4.49	5.16	5.56	5.96
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
F-test excl.	-	51.22	-	21.77	-	38.44	-	10.27
p-value	-	0.0000	-	0.0000	-	0.0000	-	0.0015

Notes: Annual data at municipal level, between 1986 and 2014. The sample is restricted, in left panel, to municipalities that have cities (according to the 2001 definition, which establishes 144 cities in a total of 121 municipalities) and in the right panel, to municipalities that have a border with the ocean (59 municipalities). Investment Expenditure is defined as the year-on-year change in local Investment Spending per capita, divided by the previous' year mean private-sector wage (Current Expenditure is defined analogously). Wage is the percentage change on the mean municipal private-sector wage. All estimated equations are population weighted and include municipality fixed effects, municipal-specific time trends and a set of microeconomic, macroeconomic and political controls. Standard errors, reported in brackets, are robust to heteroskedasticity and clustered at the NUTSIII×year level. Estimation is done by two-stage least-squares, using D.local election as an instrumental variable, which is equal to one in all local election years. Significance levels: * p<0.1, ** p<0.05, *** p<0.01