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JEL Classification: D72, E62, H72

Keywords: instrumental variables, local governments, Local fiscal multiplier, firm performance, fragmentation, Local identity, religion

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Annual Meeting of the Portuguese Economic Journal for their suggestions. Data assistance by Ernesto Freitas is thankfully recognized. All errors are our own. This version: February 2020.

Public Expenditure and Private Firm Performance: Using Religious Denominations for Causal Inference*

Henrique Alpalhão† Marta Lopes‡ João Pereira dos Santos§ José Tavares¶

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We investigate the causal relationship between local government expenditure and private firm performance, using the quantity and naming of civil parishes within each municipality as an instrumental variable. Religious denominations are taken as a proxy for strong local identity, which likely increases competition for resources between neighboring parishes. We explore a dataset on the universe of private firms, local government expenditure categories and socio-economic indicators for all mainland Portuguese municipalities, in a period encompassing both normal and crisis times. The number of parishes per municipality, as exogenously set by the central government, and the number of parishes that display religious denominations are both used as instruments that explain local government spending, indirectly impacting firm performance. We find that both display considerable power in determining total primary and current spending, which then positively impacts private firms' sales and value added. Using religious denominations is found to yield a particularly potent instrument, confirming and expanding the baseline results. In a field that mostly relies on natural experiments for instrumental variable frameworks, our proposed instruments are both easily obtainable and powerful.

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1 Introduction

(How) does government expenditure impact GDP? This question has for long been at the center of policy-oriented economic research. At its core is the fiscal multiplier mechanism, as first proposed by Kahn (1931): the idea that a unitary increase in government spending could yield a more-than-unitary increase in output.

Two main components are at play in this process. On the one hand, an increase in government purchases, by increasing demand, should boost firm sales and hence employment, leading to higher purchasing power and second-round demand increases. On the other hand, an increase in spending will necessarily imply financing now or in the future, to which Ricardian agents would react with lower private consumption and investment today (the crowding out effect). Should the first effect overpower the second, governments could find in the expansion of expenditure a powerful tool to drive a depressed economy to full employment.

It is, however, likely that this process is at its maximum effectiveness during a recession - indeed, if some slack between current and potential output is present, supply should be able to expand in response to higher demand. Conversely, if the economy is operating at full employment, firms might not be able to increase production substantially, and higher demand would simply generate inflation.

Extant research on this issue relies mostly on country-wide studies. Favero et al. (2011) identify several shortcomings to this approach - of paramount importance are the heterogeneity between countries and even regions within a country[1] and the information loss that such an aggregate estimation implies. They rather emphasize the advantages of a local-level approach, which has given rise to an emerging field: sub-national government fiscal policy and multipliers, as in Brückner and Tuladhar (2013) or Auerbach et al. (2019). Local-level estimation does indeed curb the heterogeneity problem, as well as potentially limit the incidence of crowding out if taxation is mostly independent of local spending. An important challenge these studies face lies in the identification strategy: concerns with endogeneity and reverse causality force researchers to find adequate, exogenous instruments for the level of government spending.

This paper proposes a new strategy to address the above-mentioned shortcomings in the literature. Firstly, we study local government expenditure across all mainland Portuguese municipalities, one of the most homogenous countries in the world in ethnic, religious and linguistic terms.[2] Secondly, our paper puts forward a new set of instruments to address the issue of endogeneity. We instrument for local (municipal) government expenditure with the total number of civil parishes within each municipality, a proxy for internal competition for expenditures, and go further by proposing the number of religiously-denominated parishes as a potent proxy for the sense of identity and rivalrous entitlement that may drive and enhance the competition for local transfers, and thus higher public expenditure. The argument, as developed in section 4, is based on the voracity procyclical fiscal policy postulation (Tornell and Lane, 1999). As Fritsch and Wyrwich (2017), we rely on historical information on an intangible, regional culture and its cross-sectional variation as an instrument to explore the determinants of firm activity, arguing that cultural identity is a primordial, strong and persistent influence on the behavior of agents (in our case, local governments).

Using these instruments for two expenditure aggregates across Portuguese municipalities, we estimate the effect of local public expenditure on private firm performance. We analyze the 2005-2012 period, which, from 2008 onwards, covers a severe recession in Portugal brought about by the sovereign debt crisis. This setting, by displaying significant slack between observed and potential output, makes our timeframe an excellent field for testing the presence of a fiscal multiplier in a recession.

We further aim to add to the literature by tying questions of local and religious identity into the magnitude of local government expenditure and by looking at the seldom explored Portuguese case at the peak of the 2008

[1] Rickman and Wang (2019), for example, suggest that differences between estimates of the effects of fiscal policy on economic growth "may relate to differences in culture, demography, history, and industry structure".

[2] Fearon (2003) ranks Portugal as the second least fractionalized country among western countries and Japan; Alesina et al. (2003) obtain equivalent results.

crisis (as far as we are aware, only Carvalho et al., 2018 do so at the local level). The remainder of this paper is organized as follows: section 2 reviews the existing literature. Section 3 presents the institutional context of local governments in Portugal, while section 4 explains our proposed instruments. Section 5 discusses the empirical strategy and the data used in this study. Section 6 details results, section 7 consists of several robustness checks, and section 8 concludes.

2 Literature review

The literature is relatively consensual in predicting that the fiscal multiplier is at its strongest in times of recession, in accordance with the theoretical argument that a negative output gap needs to be present for an increase in government expenditures to boost output (See, for example, Tagkalakis, 2008; Auerbach and Gorodnichenko, 2012; Auerbach and Gorodnichenko, 2013 and Hernandez de Cos and Moral-Benito, 2016). Existing estimates for its sign and magnitude, however, are somewhat disparate.

Several results are available for the value of the country-wide fiscal multiplier. Auerbach and Gorodnichenko (2012), for the US, obtain an expenditure multiplier of 0 to 0.5 (an additional dollar of public expenditure yields an increase of \$0 to \$0.5 in GDP) in periods of expansion and 1 to 1.5 during recessions. For Germany and the UK (from 1971 to 2004), Bénassi-Quéré and Cimadomo (2006) find less potent results: while multipliers for net tax cuts are found to generally range between 0.9 and 1.2 in Germany, those for increased government expenditures are not found to be significantly different from zero in either of those countries. These findings, however, may suffer from their pre-crisis setting. Ilzetzki et al. (2013), studying a broad array of countries, add a useful insight: high indebtedness (debt above 60% of GDP) is found to significantly decrease the multiplier, which can be explained by a higher tendency for consumers to behave in a Ricardian way.[3]

Favero et al. (2011), however, provide an encompassing argument on how a cross-country computation of fiscal multipliers fails on multiple accounts, as the magnitude and sign of the fiscal multiplier depend on factors as diverse as debt dynamics, an economy's degree of openness and several idiosyncratic country factors.[4] This finding clearly suggests that the measurement of the impact of government expenditures on the economy should be made as locally as possible.

The literature on local fiscal multipliers is, hence, enjoying a boom. First and foremost, the higher multipliers for depressed economies result has been found to hold at the regional level (Brückner and Tuladhar, 2013; Suárez Serrato and Wingdener, 2016). For the US, both Suárez Serrato and Wingdener (2016) and Auerbach et al. (2019) find a sizable impact of local expenditure on regional economic outcomes. The latter, specifically, obtain a multiplier of 1 at the city level and 0.5 for neighboring cities, bringing the state-level multiplier estimate to 1.5.

Brückner and Tuladhar (2013) perform another regional-level crisis period analysis using data for Japanese prefectures during the 1990s. They find that the government spending multiplier is significantly positive, albeit, on average, lower than 1 (with transfers to firms yielding the highest multiplier).

Chodorow-Reich (2019a) provides interesting insight on why, at the local level, agents may not behave in a Ricardian manner, which could suggest that local multipliers are higher than national ones. Specifically, since increased local spending seldom implies increased local taxation (rather being financed by the national or supra-national budgets), crowding out via lower consumption may be attenuated or even nullified. Budget constrains, by distorting the intertemporal consumption decision of agents, are another reason Chodorow-Reich puts forward for the Ricardian Equivalence to fail - in crisis times, agents may find a transfer today to be constraint alleviating. In this framework, the government, by intervening in a way that increases consumption possibilities in the present, may act as a lender for households, hence further and significantly reducing crowding-out effects.

[3] Hernandez de Cos and Moral-Benito (2016) back this proposition, using data from the Spanish economy in the 1986-2012 timeframe. The multiplier they obtain amounts to 1.4 during global crisis periods and 0.6 during tranquil times.

[4] Such as the legal and cultural context.

Two applications to the Portuguese economy are especially noteworthy. Firstly, Carvalho et al. (2018), using a database encompassing all mainland municipalities from 1986 to 2014, find that a local investment and current expenditure percentage increase induces a more-than-unitary percentual increase in the number of full-time workers, and that larger municipalities tend to display higher multipliers. Secondly, Pereira dos Santos and Tavares (2018) conclude that EU transfers to municipalities do foster firm creation more strongly in times of crisis.

The instrumental variables used for these local level estimations vary greatly and tend to be country-specific (Auerbach et al., 2019, for example, use US Department of Defense contracts), oftentimes leaving researchers at the mercy of the occurrence of exogenous shocks (such as Suárez Serrato and Wingender, 2016 and Cerqua and Pellegrini, 2018). Our proposed instruments, while still tailored to the Portuguese case, are much more easily obtainable, and may additionally pave the way for the application of similar frameworks to other regions or countries.

In the literature, identity and partisan behavior have been singled out as a driver for government expenditure: Tornell and Lane (1999) show how, in the presence of powerful interest groups and discretionary national fiscal policy, a positive economic shock could generate a more-than-proportional increase in redistribution (the voracity procyclical fiscal policy argument). This idea, discussed in section 4, will be central for our identification strategy.

All in all, our use of local-level data for a highly-homogeneous country, a novel instrumental variable proxying for fiscal competition and a timeframe of deep, almost unparalleled crisis in postwar European economic history makes our setting borderline ideal to test the production-boosting capabilities of governments via increased expenditure.

3 Local governments in Portugal

3.1 Municipalities

We start by presenting an overview of the legal framework and competences of sub-national government bodies in Portugal.[5] These are organized in two levels: the autonomous regions of Madeira and Azores and the administrative municipalities (278 in mainland Portugal). The former enjoy some freedom in lawmaking, for instance regarding fiscal policy, explaining our focus on the mainland municipalities. This makes our political setting a quite centralized one, with no regional or federative political bodies intervening in dealings between local governments and the national one.

Laws 159/99, 169/99 and 5-A/2002 establish the competences of local governments, both at the municipality and parish level. They determine that local governments should align their action with the central government's goals as well as their own, acting in fields such as planning, management, licensing and investment. Municipalities act in domains such as energy, transport and communication, education, housing, urban and rural planning and local development. The latter can be pursued via investment in municipal firms, the support of local employment and professional training initiatives, the promotion of tourism or firm licensing.

Transfers from the central government to local municipalities are made in accordance with local needs, as well as regional and national ones. They can be both universal (i.e. made in the same amount for all municipalities) and municipality-specific.[6] Their magnitude is bound by the central government budget, which sets planned expenditure for each year.

In this context, municipalities are responsible for the bulk of consolidated expenditures of the local tier of government, which are divided into current and capital expenditures. Specifically, the former include expenditure on goods and services and compensation of employees, while the latter comprise investment, financial assets and liabilities, and capital transfers to parishes. Carvalho et al. (2018) provide useful insight on the revenue side of municipalities - namely, that both current and capital revenues are, in the 1986-2014 timeframe, mostly composed

[5] See also Veiga and Veiga (2007), Castro and Martins (2013) and Lopes da Fonseca (2019) for more details on the Portuguese local government electoral and budgetary frameworks.

[6] Note how this allows for discretionary allocation of transfers to specific municipalities.

by transfers (and increasingly so, in the case of current revenues).[7] On the other hand, the relative importance of real estate as a fiscal basis for local taxes has significantly increased in the past decade since municipalities have, within certain limits, the autonomy to set property tax rates (called *IMI*). Remaining resources come from vehicle, property transfer and corporate income taxes, fees, fines and debt.

This brief overview sheds light on the sizable control municipalities hold over their expenditure and received transfers, as well as the at least partially discretionary method of central government transfer allocation. Additionally, the fact that total central government transfers to municipalities are bound by law to the limit established in the government budget makes local-level spending changes exogenous to private income - when a municipality secures increased transfers to expand spending, it is simply capturing them from other municipalities. Agents, as such, will be less prone to expect higher future taxes from higher local spending, which should reduce the incidence of the crowding out effect.

3.2 Parishes

Our sample comprises all 4037 mainland parishes, their number per municipality ranging from 89 (Barcelos) to only 1 (São João da Madeira, Barrancos, São Brás de Alportel, Alpiarça and Entroncamento).[8] According to the aforementioned laws, parish competences include investment planning, management and implementation; the establishment of cooperation contracts with public or private entities, possibly to provide public services; the provision of public services, such as those related to education, culture, sports, basic healthcare and environment protection; social action; local development; and finally urban and rural planning. Furthermore, municipalities may delegate some of their competences to their parishes, which include investment, the management of municipal services and infrastructure cleaning and maintenance.

An important characteristic of parish income is that it corresponds almost exactly to municipal expenditure - in other words, the majority of parish expenditure is directly financed by municipal transfers. This severely limits parishes' ability to perform policy, given that, while they may decide on how to allocate expenditure, they can hardly influence its amount by drawing on sources other than municipal expenditure. According to laws 2/2007 and 42/98, the avenues through which parishes may raise additional income are the retention of 50% of the *IMI* tax on rural buildings, fees on the provision of services,[9] earnings from markets and cemeteries, fines, earnings from the use and sale of their property, donations, and short-term loans. Unfortunately, no data on the magnitude of these figures exists - given how most of them are public services, however, it is not likely that they constitute a profitable enterprise. Additionally, the crisis timeframe ensures that short-term loans were at best in limited supply.

4 The instrument

As section 2 points out, one of the major issues that research on the impact of government policy on economic performance faces is dealing with endogeneity and reverse causality. These may arise, for example, due to the automatic stabilizer character of government expenditure (Suárez Serrato and Wingender, 2016);[10] the obvious relationship between lower regional development and higher fiscal intervention (Cerqua and Pellegrini, 2018) and the potentially politically-related availability of funds for local governments to spend. Nakamura and Steinsson (2014) illustrate this last point resorting to the example of military spending, while Pinho and Veiga (2004) find that central government transfers to Portuguese municipalities are indeed impacted by political factors.

[7] See also Pereira dos Santos and Tavares (2018) for insight on the role of European funds in local budgets.

[8] Appendix 2 depicts the geographical distribution of this figure, while Appendix 3 presents it for all used municipalities. These figures correspond to those set in 1999. A reorganization was enacted by the central government in 2013, via laws 22/2012 and 11-A/2013, which significantly reduced the number of parishes in the mainland to 2882.

[9] Which include those related to local markets and fairs, cemeteries, public and administrative services and pet licensing.

[10] Who, along with Auerbach et al. (2019), find that failing to account for these issues leads to a strong downward bias in the estimation of returns to government expenditure.

Rickman and Wang (2019) provide a comprehensive account of previous studies on the US economy and how they account for this issue. They identify three main strategies: the use of fiscal variable time lags, IV (namely natural experiments) and GMM.

The first is, according to Rickman and Wang (2019), the most common approach. They note how it cannot be relied on to eliminate endogeneity, although it may indeed reduce its likelihood. It is, nonetheless, useful for curbing the occurrence of reverse causality, and will hence be incorporated into our specification strategy. The use of GMM, similarly, by relying on internal instruments (i.e. instrumenting for fiscal expenditure with its lags or differences), is argued to potentially suffer from analogous issues.[11]

The best way of dealing with these concerns, hence, seems to be the use of an instrumental variable for government expenditure.[12] As Poot (2000) puts it: "If growth regressions continue to have policy variables on the right hand side, special efforts should be made to find suitable instrumental variables to avoid biased policy variable coefficients. Potential candidates could be certain demographic, geographic or political features of countries and regions."

We propose two such instruments, which are, as far as we are aware, an innovation.[13]

4.1 Number of parishes

Our first proposed instrument is the number of parishes in each municipality, as set in 1999 by the central government. The amount of parishes in a given municipality should display sizable correlation with local expenditures (reported in Appendix 1's Table A1), for an extra parish implies both higher variable and fixed costs (such as personnel costs and the need to have a physical office). Its reasoning, however, goes beyond this idea by resting on Tornell and Lane's (1999) "voracity effect": the idea that, in an economy populated by powerful, competing agents under a government that discretionarily allocates transfers between them, a positive economic shock should generate a more-than-proportional increase in fiscal redistribution, and hence a higher availability of funds to spend.[14] Through this mechanism, for any circumstance that warrants local demands for increased central government transfers, a municipality with a higher number of powerful agents - in our case, parishes - should, via lobbying behavior,[15] secure a higher amount of funds than one with a lower amount of parishes, hence allowing for relatively higher expenditure.

Our framework seems well suited for the occurrence of this phenomenon. Firstly, the discretionary allocation of funds from the central government to municipalities is backed by the literature: Pinho and Veiga (2004) find that not only economic and social, but also discretionary factors (such as being in a local or national election year and the mayor's tenure) impact the allocation of central government funds to Portuguese municipalities. Secondly, the central government budget's limiting of the total amount of transfers to municipalities is similar to the Tornell and Lane assumption of balanced budgets. Finally, the local identity and policy instruments that parishes hold make them likely to display competitive behavior towards other local government bodies, in order to secure funds for their own use.

In order for our instrument to comply with the exclusion restriction, the number of parishes in a municipality should only impact our dependent variable - private firm performance - via the increased expenditure it creates.

[11] Rickman and Wang (2019): "Use of lagged variables as instruments in GMM again begs the question of true causality versus causality in timing of changes in the variables". Brückner and Tuladhar (2013), for example, use system-GMM.

[12] This strategy is adopted on numerous articles regarding local fiscal multipliers, such as Suárez Serrato and Wingender (2016), Cerqua and Pellegrini (2018), Chodorow-Reich (2019a) or Auerbach et al. (2019).

[13] Note that Carvalho et al. (2018) also put forward an instrument for the Portuguese case, based on the political business cycles mechanism: a dummy for election years. Our approach takes a different but complementary route in that it aims to identify an arguably exogenous driver of consistently higher expenditure, rather than a trigger for its temporary occurrence.

[14] Note, however, that the impact of this effect on growth is found to be negative - we simply aim to argue that a higher number of agents should be a good predictor for higher local expenditure.

[15] Which does not necessarily imply that parishes do so directly to the central government - they could plausibly lobby at the municipal level, then pushing municipalities to demand higher transfers from the state.

However, the specific tasks of parishes,[16] while not numerous, comprise investment and infrastructure maintenance, for example. This may give them the power to influence both the composition and targets of local expenditure, meaning that higher decentralization could be argued to increase the efficiency of public provision by allowing policy to be catered to more homogeneous and specific local preferences (Faguet, 2014) and that it decreases corruption (Shah, 2006); or conversely that it has the opposite effects via lower public good productive efficiency and reduced human capital (Faguet, 2014). If this is the case, each unit of public spending in a less centralized municipality could be more or less effective in spurring the economic environment than in more centralized ones, effectively compromising our instrument. This risk can be minimized by controlling for decentralization in empirical estimations - we thus implement such measures by controlling for population density.

Faguet further discusses how higher decentralization - in our case, a higher number of parishes per municipality - tends to threaten fiscal sustainability by increasing total government expenditure: local politicians, due to lower accountability, have an incentive to overspend and defer the costs to central government bailouts. This could be regarded as an extra avenue through which the number of parishes in a given municipality influences its expenditure - however, if parishes are indeed in practice unable to raise funds beyond those stemming from municipal transfers, this additional factor should be of negligible importance.

4.2 Number of religiously denominated parishes

Given the above-mentioned caveat and to ensure robustness against endogeneity, we put forward our second instrument: the number of parishes (as set by the central government in 1999) that display a religious name. The idea is as follows:

Parishes are mostly the outcome of ancient religious traditions and disputes between neighboring areas, rather than any economic or regional development concern (Santos, 1995). Those that hold a religious denomination, specifically, tend to be more traditional and associated with their own patron saint and local church, around which social and civic life revolves. We argue that such features make citizens more competitive for resources, especially when competing with neighbors whose local identities can be similarly activated, and thus that the number of jurisdictions with a religious denomination is a possible, potent proxy for fiscal competition. This use of an historical factor to identify an underlying, persistent culture is not dissimilar from the work of Fritsch and Wyrwich (2017), who use historical levels of self-employment, representing a culture of entrepreneurship, as a successful instrument for startup activity.[17]

Indeed, in Table 1 we find that, using a simple OLS for a panel of 4034 of the 4037[18] mainland parishes from 2003 to 2012, religious denominations do explain received transfers positively and significantly.[19]

It is noteworthy that a religious denomination does not seem to imply that a parish has existed for a long time. We investigate this issue using a dataset that details which already existed in 1900, for which data is available for 3973 out of all 4037 parishes, encompassing 613 of the 628 religiously denominated ones. We find that 3047 out of the 3589 ancient ones do not display a religious denomination, while 71 of the 384 younger ones do. The correlation between religious naming and existing in 1900 is -0.0277 - the effect that these denominations capture does not seem to be long-running existence, but some inherent social cohesion that cannot be built by time alone.

Due to its specificity, this instrument is unlikely to cause endogeneity concerns stemming from both decentralization and other factors, as it simply for stands for the number of strong-identity parishes in a municipality. The comparison of results obtained with both instruments is, hence, likely to be an adequate test for the decentralization

[16] As discussed in section 3.

[17] The hypothesis of a seemingly random historical factor explaining a persistent behavior can additionally be seen as a kind of path dependence - for an encompassing discussion on this topic in what regards economic geography and local-level analysis, refer to Martin and Sunley (2006).

[18] No data on received transfers is available for the missing 3 - Vale de Amoreira, Moita and Agualva-Cacém.

[19] Additionally, religiously-denominated parishes receive, for this sample and on average, a higher amount of yearly transfers than all others - approximately €56 500 vs. €43 200.

Table 1: Religious parishes and received transfers

	$Y = \ln(Total\ Parish\ Transfers)$				
	(1)	(2)	(3)	(4)	(5)
Religiously Named	0.088***	0.088***	0.062**	0.062**	0.060**
	(0.033)	(0.033)	(0.030)	(0.030)	(0.027)
Obs.	40 340	40 340	40 340	40 340	40 340
Adjusted R^2	0.302	0.302	0.459	0.456	0.587
Year	✓	✓	✓	✓	✓
NUTS2	✓				
NUTS2*Year		✓			
NUTS3			✓		
NUTS3*Year				✓	
Municipalities					✓

This table reports preliminary religiously-named/transfers estimation results, a simple yearly OLS panel regression for 4034 of the 4037 mainland parishes, from 2003 to 2012. The missing parishes are Vale de Amoreira, Moita and Agualva-Cacém, for which there is no data on received transfers. Year fixed effects are included throughout and several different regional fixed effects are tested, displaying consistent and robust results. Standard errors in parentheses are clustered at the municipal level and are robust to heteroscedasticity. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***).

issue; it additionally serves to further delve into the importance of local identity in explaining local government expenditure.

A final advantage of both these alternatives is their availability - they rely on a discrete, easily observable characteristic rather than any computation or data series. In Appendix 1, Table A1 presents the variance-covariance matrix for the two proposed instrumental variables and our two measures of local government expenditure. While our estimations should yield more relevant information regarding this link, two factors are immediately noticeable: the (expected) positive correlation between our instruments and the expenditure variables and the fact that this value is stronger for *# Rel. Parishes* variable than for *# Parishes*, suggesting that the former may be a more powerful instrument.

Appendix 2's Figure A1 shows the geographical distribution of the two proposed instrumental variables across mainland Portugal. While clustering to the north of the territory is evident for the *# Parishes* variable, this tendency seems to disappear with *# Rel. Parishes*, with municipalities in the upper tier being spread evenly.

5 Empirical strategy and data

We draw on a yearly database including economic, political and demographic information for the 278 mainland Portuguese municipalities between the years of 2003 and 2012. An instrumental variable estimation procedure is employed, using first and second stages, respectively, as follows:

$$Municipal\ Expenditure_{i,t-1} = \beta_0 + \beta_1 Instrument_{i,1999} + \beta_n Controls_{i,t-1} + \mu_{i,t} \quad (1)$$

$$Private\ Firm\ Performance_{i,t} = \beta_0 + \beta_1 Municipal\ Expenditure_{i,t-1} + \beta_n Controls_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

Where i stands for the municipality, t is the average of each variable's yearly value between 2007 and 2008 and *t-1* the same average between 2005 and 2006.[20] Averaging the variable values along two years aims to minimize measurement errors: *Private Firm Performance* variables are the average of their 2007 and 2008 values, while all

[20]This corresponds to the dawn of the 2008 financial crisis. Section 7 further delves into the recession period by performing the same estimation for the 2009-2012 timeframe.

other covariates are the average of their 2005 and 2006 values.[21] Lagging the controls, as discussed in section 4, aims to curb potential endogeneity and reverse causality issues: increased firm performance in period t should not impact covariates in *t-1*.

Municipal Expenditure measures the expenditure of each municipality for a given period. Two different aggregates are used for this measure: total current expenditure ($\ln(Total\,Curr\,Exp)$) and total expenditure ($\ln(Total\,Exp)$). Given that, according to the mentioned laws in section 3, parishes may enjoy some freedom in determining the targets of public investment, the use of both as a policy variable should further help to curb endogeneity.

Private Firm Performance measures the performance of private firms. We again use two measures for this variable: total gross value added ($\ln(Total\,GVA)$) and the total value of sales ($\ln(Total\,Sales)$). Moreover, we include covariates that control for other socioeconomic and political variables that might also influence regional development, firm performance and the government's propensity to spend. Finally, *Instrument* corresponds to either *# Parishes* or *# Rel. Parishes*.

Firstly, we include *Population Density* as a measure of decentralization,[22] which, as discussed before, has been found to impact the performance of local governments and is thus essential to limit endogeneity concerns regarding the *# Parishes* instrument. Additionally, the attractiveness of a given municipality for businesses and the exuberance of its economic environment should be an important determinant for the magnitude of the fiscal multiplier - the higher the amount of firms in operation, employed workers and value added, the higher the scope for the multiplicative effect. As such, we include several covariates that illustrate this dimension: the share of highly-educated workers,[23] the local property (*IMI*) and business tax (*derrama*) rates,[24] the prevalence of industrial areas,[25] and the presence of a nearby highway connection.[26] We further include the total urban area of each municipality and per capita electricity consumption as a measure of regional development and income.

Political factors are also likely to play a role in the impact of public spending on local economies. Therefore, we control for the percentage of leftist mandates in each jurisdiction[27] and the existence of a majority in the town hall,[28] which is expected to facilitate policy action.

Finally, the inclusion of a measure of economic slack is essential, given that it is in a downturn that fiscal policy may achieve maximum impact. To account for this, we include the local unemployment rate, in line with Brückner and Tuladhar (2013), Nakamura and Steinsson (2014), Chodorow-Reich (2019) and Auerbach et al. (2019).[29] Indeed, for Portugal specifically, Carvalho et al. (2018) find that local spending yields increased impact in periods of high unemployment.

In Table 2 we present descriptive statistics for all variables.

[21] As mentioned before, the instruments correspond to 1999 values.

[22] Which is achieved through the combined inclusion of this variable and the instrument.

[23] As measured by the share of the local labor force who holds tertiary education, which is likely to attract more firms, as well as those that create higher value-added. Baptista and Mendonça (2010) find, using data for Portuguese municipalities, that regional access to knowledge and an educated workforce significantly influences firm location in specific sectors.

[24] In line with Brückner and Tuladhar, 2013, who use local tax revenues.

[25] In line with Brückner and Tuladhar, 2013, who use the share of manufacturing firms in the economy and Cerqua and Pellegrini (2018), who use the number of manufacturing plants per municipality. Audretsch et al. (2004), additionally, illustrate the expansion of industrial parks, science and technology incubators as the most effective start-up oriented policy.

[26] As found by Holl (2004) and Audretsch et al. (2017) for Portuguese municipalities.

[27] In line with Carvalho et al. (2018). Reynolds et al. (1994) argues that right-wing conservatism tends to be related with a resilient entrepreneurial culture - a negative coefficient is, hence, expected.

[28] In line with Carvalho et al., 2018.

[29] Additionally, Fritsch and Falck (2007) put forward that a high level of short-term unemployment has a positive impact on the number of start-ups.

Table 2: Descriptive statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Private Firm Performance (2007-08 averages)					
$\ln(Total\,GVA)$	277	17.538	1.628	13.802	22.64
$\ln(Total\,Sales)$	278	18.968	1.601	15.531	24.048
Municipal Expenditure (2005-06 averages)					
$\ln(Total\,Curr\,Exp)$	278	9.086	0.826	7.846	12.896
$\ln(Total\,Exp)$	278	9.62	0.783	8.228	13.231
Instrument (1999 values)					
# Parishes	278	14.522	12.772	1	89
# Rel. Parishes	278	2.259	3.293	0	30
Controls (2005-06 averages)					
Total Urban Area	278	11.387	14.796	0.334	91.279
Electricity Cons.	278	4274.38	4663.8	1569.905	60442.36
IMI	278	0.706	0.109	0.4	0.8
Industrial Area	278	0.014	0.023	0	0.15
Unemp. Rate	278	6.313	2.189	1.612	14.217
Highways	278	0.538	0.499	0	1
Tertiary Educ.	278	0.058	0.028	0.02	0.256
Pop. Density	278	0.312	0.856	0.006	7.359
Leftist Mandates	278	0.543	0.245	0	1
Mayor Majority	278	0.896	0.222	0	1
Business Tax Rate	278	0.05	0.047	0	0.1

$\ln(Total\,GVA)$ displays 277, rather than 278 observations. This is due to the negative average 2007-08 total GVA in the Aljustrel municipality - this specific observation is dropped in the logarithmization process.

Table 3: Baseline results (unweighted)

	$\ln(Total\,GVA)$			$\ln(Total\,Sales)$		
	OLS	IV $\#\,Parishes$	IV $\#\,Rel.\,Parishes$	OLS	IV $\#\,Parishes$	IV $\#\,Rel.\,Parishes$
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(Total\,Curr\,Exp)$	1.396***	1.514***	1.493***	1.399***	1.542***	1.413***
	(0.088)	(0.117)	(0.141)	(0.092)	(0.114)	(0.142)
Obs.	277	277	277	278	278	278
$Adjusted\,R^2$	0.854	0.853	0.854	0.858	0.856	0.858
First-stage instrument		0.026***	0.072***		0.026***	0.072***
		(0.003)	(0.009)		(0.003)	(0.009)
First-stage F test		97.50	63.39		97.71	63.39
$\ln(Total\,Exp)$	1.359***	1.406***	1.486***	1.368***	1.432***	1.406***
	(0.089)	(0.111)	(0.139)	(0.093)	(0.106)	(0.138)
Obs.	277	277	277	278	278	278
$Adjusted\,R^2$	0.845	0.845	0.844	0.850	0.850	0.850
First-stage instrument		0.028***	0.072***		0.028***	0.072***
		(0.003)	(0.009)		(0.003)	(0.009)
First-stage F test		108.19	68.26		108.34	68.24
NUTS2	✓	✓	✓	✓	✓	✓
$Controls_{t-1}$	✓	✓	✓	✓	✓	✓
Inst.: $\#\,Parishes$		✓			✓	
Inst.: $\#\,Rel.\,Parishes$			✓			✓

NUTS2 (in their 2002 version) refers to the used geographical control variable - the Portuguese mainland regions (5 in number: Norte, Centro, Lisboa, Alentejo and Algarve). The reported IV estimations are unweighted. Standard errors in parentheses are clustered at the municipal level and are robust to heteroscedasticity. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***).

6 Results

6.1 Baseline

Our IV procedure requires that the instrumental variables do not directly cause our *Private Firm Performance* variables. Thus, we begin by testing for this issue with a reduced-form OLS estimation as follows:

$$Private\,Firm\,Performance_{i,t} = \beta_0 + \beta_1 Instrument_{i,t-1} + \beta_2 Municipal\,Expenditure_{i,t-1} + \beta_n Controls_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

where *Instrument* is either *# Parishes* or *# Rel. Parishes*, *Municipal Expenditure* is either $\ln(Total\,GVA)$ or $\ln(Total\,Sales)$ and *Controls* are as detailed in Table 2. Results for this exercise are presented in Appendix 1 in the form of Table A2, and find no significance for the *# Parishes* or *# Rel. Parishes* instruments in any instance, which, while not constituting evidence of instrument exogeneity, does seem to point in that direction.

Table 3 portray the results of the unweighted IV estimation strategy using both $\ln(Total\,GVA)$ and $\ln(Total\,Sales)$ as dependent variables.[30] Columns (1) and (4) display the simple OLS estimates, (2) and (5) employ *# Parishes* as an instrument and (3) and (6) use *# Rel. Parishes*.

Both instruments are significant across the board, at a level of 1%. Results are aligned with the literature and consistent in terms of sign, statistical significance and coefficient: for both Gross Value Added and Total Sales, the impact of both expenditure variables comes out highly significant and positive. The evidence is that a percent

[30] Table A3 presents the analogous, weighted by population estimation, which yields equivalent results. For further insight on the issue of weighted vs. unweighted estimation, refer to Chodorow-Reich (2019b).

increase in both current and total municipal expenditure impacts the firm performance variables by approximately 1.4% to 1.5% - a large impact that can be explained by the substantial recession Portugal then felt. The instrument choice does not sizably impact the first-stage coefficients - *# Rel. Parishes*, however, does yield a noticeably higher coefficient in the first-stage estimations, indicating that it is indeed a more powerful instrument and that whatever drives the relationship between number of parishes and expenditures at the municipal level is enhanced in religiously denominated parishes.

As discussed in section 4, *# Parishes* may be subject to the decentralization arguments, making *# Rel. Parishes* a more reliable instrument in ensuring exogeneity. Fortunately, they yield equivalent results - this similarity of outcomes could suggest that the endogeneity concerns with decentralization are of negligible impact in our case.

Finally, we provide evidence that, in the 2008 crisis setting, expenditure by local authorities in Portugal did positively impact the performance of private firms. While these results are not enough to precisely conclude on the value of a local fiscal multiplier, the theoretical predictions of reduced crowding out at the local level and consumer budget constraints in times of crisis make these findings plausibly suggest an above-1 multiplier.

7 Robustness

In this section, we perform several robustness tests to our results by running the section 6 estimations with different covariates and several different sample selections. Firstly, we replace our region-level fixed effects (NUTS2) with their sub-region-level equivalent (NUTS3). Table 4 shows results for this exercise, which present exactly the same conclusions as those in the previous section.

A potential concern is whether our results are driven by specific municipalities, as economic development is higher in coastal areas and, specifically, the metropolitan areas of Lisbon and Oporto.

This can be observed in Table A4, in the appendix, which displays normalized descriptive statistics for the firm performance variables in these regions and in the full dataset. While the effect is stronger in the metropolitan areas, it is indeed clear that these regions are, on average, not only more developed but also more homogeneously so than the full sample.

Hence, to verify that this phenomenon does not impact our results, in Table 5 and Table 6 we remove all observations for the Lisbon and Oporto metropolitan areas and all coastal municipalities, respectively.

Finally, in Table 7 we perform the same estimation as in Table 2 with data for a different timeframe: 2011-12 for the *Private Firm Performance* variables and 2009-10 for all others. This serves to test for our results' robustness to different years of analysis by delving deeper into the crisis setting.[31]

All estimations, as these tables show, retain previous conclusions: both instruments are highly significant, *# Rel. Parishes* displays higher power than *# Parishes* and local expenditure is predicted to have a positive and more-than-proportional effect on firm performance.

8 Concluding remarks

This paper proposes a new type of instrumental variable to assess how increases in local expenditure impact private firm performance. We address potential endogeneity between municipal expenditure and private firm performance, a widely present issue in the literature, by instrumenting for the former with both the total number of jurisdictions (parishes) within a municipality and the number of religiously-denominated ones. Our hypothesis is that, whatever the impact of a higher number of parishes on municipal expenditures, municipalities with a religious naming signal (and foster) deeper cultural identity forces that may further increase expenditure. This is grounded on the "voracity

[31] Descriptive statistics for this dataset are included in the appendix, in Table A5.

Table 4: Robustness tests: region fixed effects

	$Y = \ln(Total\,GVA)$		$Y = \ln(Total\,Sales)$	
	$\#\,Parishes$	$\#\,Rel.\,Parishes$	$\#\,Parishes$	$\#\,Rel.\,Parishes$
	(1)	(2)	(3)	(4)
$\ln(Total\,Curr\,Exp)$	1.544***	1.360***	1.551***	1.272***
	(0.101)	(0.126)	(0.105)	(0.117)
Obs.	277	277	278	278
$Adjusted\,R^2$	0.899	0.899	0.902	0.902
First-stage instrument	0.033***	0.083***	0.033***	0.083***
	(0.003)	(0.010)	(0.003)	(0.010)
First-stage F test	151.85	74.49	152.01	74.58
$\ln(Total\,Exp)$	1.488***	1.372***	1.496***	1.283***
	(0.098)	(0.132)	(0.100)	(0.119)
Obs.	277	277	278	278
$Adjusted\,R^2$	0.897	0.898	0.903	0.903
First-stage instrument	0.034***	0.082***	0.034***	0.082***
	(0.003)	(0.009)	(0.003)	(0.009)
First-stage F test	164.15	80.51	164.25	80.59
NUTS3	✓	✓	✓	✓
$Controls_{t-1}$	✓	✓	✓	✓
Inst.: $\#\,Parishes$	✓		✓	
Inst.: $\#\,Rel.\,Parishes$		✓		✓

NUTS3 (in their 2002 version) refers to the used geographical control variable - the Portuguese mainland sub-regions (28 in number: Alentejo Central, Alentejo Litoral, Algarve, Alto Alentejo, Alto Trás-os-Montes, Ave, Baixo Alentejo, Baixo Mondego, Baixo Vouga, Beira Interior Norte, Beira Interior Sul, Cova da Beira, Cávado, Douro, Dão-Lafões, Entre Douro e Vouga, Grande Lisboa, Grande Porto, Lezíria do Tejo, Minho-Lima, Médio Tejo, Oeste, Península de Setúbal, Pinhal Interior Norte, Pinhal Interior Sul, Pinhal Litoral, Serra da Estrela and Tâmega). The reported IV estimations are unweighted. Standard errors in parentheses are clustered at the municipal level and are robust to heteroscedasticity. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***).

Table 5: Robustness tests: no metropolitan areas

	$Y = \ln(Total\,GVA)$		$Y = \ln(Total\,Sales)$	
	$\#\,Parishes$	$\#\,Rel.\,Parishes$	$\#\,Parishes$	$\#\,Rel.\,Parishes$
	(1)	(2)	(3)	(4)
$\ln(Total\,Curr\,Exp)$	1.466***	1.366***	1.512***	1.293***
	(0.129)	(0.177)	(0.124)	(0.182)
Obs.	243	243	244	244
$Adjusted\,R^2$	0.817	0.817	0.824	0.821
First-stage instrument	0.027***	0.085***	0.027***	0.085***
	(0.003)	(0.011)	(0.003)	(0.011)
First-stage F test	98.47	61.01	98.72	61.20
$\ln(Total\,Exp)$	1.353***	1.368***	1.395***	1.295***
	(0.128)	(0.186)	(0.121)	(0.189)
Obs.	243	243	244	244
$Adjusted\,R^2$	0.805	0.805	0.813	0.811
First-stage instrument	0.029***	0.085***	0.029***	0.085***
	(0.003)	(0.010)	(0.003)	(0.010)
First-stage F test	109.09	64.86	109.24	65.07
NUTS2	✓	✓	✓	✓
No metropolitan areas	✓	✓	✓	✓
$Controls_{t-1}$	✓	✓	✓	✓
Inst.: $\#\,Parishes$	✓		✓	
Inst.: $\#\,Rel.\,Parishes$		✓		✓

These estimations correspond to those in Table 3 without considering municipalities in the metropolitan areas of Lisbon and Porto. Data for the following municipalities was dropped: Cascais, Lisboa, Loures, Mafra, Oeiras, Sintra, Vila Franca de Xira, Amadora, Odivelas, Alcochete, Almada, Barreiro, Moita, Montijo, Palmela, Seixal, Sesimbra, Setúbal, Arouca, Espinho, Santa Maria da Feira, Oliveira de Azeméis, São João da Madeira, Gondomar, Maia, Matosinhos, Paredes, Porto, Póvoa de Varzim, Santo Tirso, Valongo, Vila do Conde, Vila Nova de Gaia and Trofa. The reported IV estimations are unweighted. Standard errors in parentheses are clustered at the municipal level and are robust to heteroscedasticity. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***).

Table 6: Robustness tests: no coastal regions

	$Y = \ln(Total\,GVA)$		$Y = \ln(Total\,Sales)$	
	$\#\,Parishes$	$\#\,Rel.\,Parishes$	$\#\,Parishes$	$\#\,Rel.\,Parishes$
	(1)	(2)	(3)	(4)
$\ln(Total\,Curr\,Exp)$	1.422***	1.383***	1.440***	1.290***
	(0.121)	(0.148)	(0.120)	(0.155)
Obs.	225	225	226	226
$Adjusted\,R^2$	0.824	0.823	0.831	0.828
First-stage instrument	0.026***	0.085***	0.026***	0.085***
	(0.003)	(0.010)	(0.003)	(0.010)
First-stage F test	100.38	72.49	100.64	72.69
$\ln(Total\,Exp)$	1.328***	1.398***	1.345***	1.304***
	(0.121)	(0.154)	(0.119)	(0.159)
Obs.	225	225	226	226
$Adjusted\,R^2$	0.807	0.808	0.816	0.815
First-stage instrument	0.028***	0.084***	0.028***	0.084***
	(0.003)	(0.010)	(0.003)	(0.010)
First-stage F test	105.84	74.14	106.04	74.36
NUTS2	✓	✓	✓	✓
No coastal municipalities	✓	✓	✓	✓
$Controls_{t-1}$	✓	✓	✓	✓
Inst.: $\#\,Parishes$	✓		✓	
Inst.: $\#\,Rel.\,Parishes$		✓		✓

These estimations correspond to those in Table 3 without considering coastal municipalities. Data for the following municipalities was dropped: Caminha, Viana do Castelo, Esposende, Póvoa de Varzim, Vila do Conde, Matosinhos, Porto, Vila Nova de Gaia, Espinho, Ovar, Murtosa, Aveiro, Ílhavo, Vagos, Mira, Cantanhede, Figueira da Foz, Pombal, Leiria, Marinha Grande, Alcobaça, Nazaré, Caldas da Rainha, Óbidos, Peniche, Lourinhã, Torres Vedras, Mafra, Sintra, Cascais, Oeiras, Lisboa, Almada, Sesimbra, Setúbal, Alcácer do Sal, Grândola, Santiago do Cacém, Sines, Odemira, Aljezur, Vila do Bispo, Lagos, Portimão, Lagoa, Silves, Albufeira, Loulé, Faro, Olhão, Tavira and Vila Real de Santo António. The reported IV estimations are unweighted. Standard errors in parentheses are clustered at the municipal level and are robust to heteroscedasticity. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***).

Table 7: Robustness tests: timeframe

	$Y = \ln(Total\,GVA)$			$Y = \ln(Total\,Sales)$		
	OLS	IV $\#\,Parishes$	IV $\#\,Rel.\,Parishes$	OLS	IV $\#\,Parishes$	IV $\#\,Rel.\,Parishes$
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(Total\,Curr\,Exp)$	1.426***	1.490***	1.494***	1.444***	1.544***	1.460***
	(0.088)	(0.119)	(0.145)	(0.098)	(0.117)	(0.149)
Obs.	278	278	278	278	278	278
$Adjusted\,R^2$	0.835	0.834	0.834	0.827	0.826	0.827
First-stage instrument		0.027***	0.073***		0.027***	0.073***
		(0.002)	(0.009)		(0.002)	(0.009)
First-stage F test		120.50	71.53		120.50	71.53
$\ln(Total\,Exp)$	1.401***	1.481***	1.510***	1.402***	1.535***	1.476***
	(0.085)	(0.126)	(0.149)	(0.096)	(0.123)	(0.153)
Obs.	278	278	278	278	278	278
$Adjusted\,R^2$	0.829	0.829	0.828	0.817	0.816	0.817
First-stage instrument		0.027***	0.072***		0.027***	0.072***
		(0.003)	(0.008)		(0.003)	(0.008)
First-stage F test		103.89	73.01		103.89	73.01
NUTS2	✓	✓	✓	✓	✓	✓
$Controls_{t-1}$	✓	✓	✓	✓	✓	✓
Inst.: $\#\,Parishes$		✓			✓	
Inst.: $\#\,Rel.\,Parishes$			✓			✓

These estimations correspond to those in Table 3 using a different timeframe - $\ln(Total\,GVA)$ and $\ln(Total\,Sales)$ correspond to the average of their yearly 2011 and 2012 values, while all other covariates correspond to the average of their yearly 2009 and 2010 values. $Nr.\,Parishes$ and $Nr.\,Rel.\,Parishes$, as before, correspond to their 1999 values. The reported IV estimations are unweighted. Standard errors in parentheses are clustered at the municipal level and are robust to heteroscedasticity. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***).

effect" idea (Tornell and Lane, 1999): a higher number of agents competing for central government transfers could increase redistribution, and hence expenditure, via a higher availability of funds to spend.

Empirically, both the number of parishes and number of religiously denominated parishes are judged exogenous when tested. Using these as instruments for current and total municipal expenditure in Portugal, we find high significance and a positive coefficient in the first stage estimations, confirming their suitability for an IV framework and our expectations regarding their impact on expenditure. Additionally, the number of religiously denominated parishes is shown to have more than double the impact on municipal expenditure than the raw number of parishes, suggesting that there is indeed a local identity related factor that either drives or strongly influences this relationship.

Using this framework, we estimate the impact of municipal expenditure on the performance of private firms in Portugal in the 2007-2008 period - an ideal setting for such a policy investigation given the crisis that then was dawning. Our results, robust to estimation using a deeper-crisis 2011-12 period of analysis, imply that local government expenditure did then sizably impact local economic activity.

We contribute to the literature in several ways. First and foremost, in a field that mostly relies on natural experiments for instrumental variable frameworks, our proposed instruments are both easily obtainable and found to be powerful. While religious denominations may be specific to a small group of countries, other indicators of local identity could serve the same purpose, potentially expanding the applicability of our research to other regions. This method, therefore, is likely to facilitate future research in the growing local fiscal multiplier field of study. Secondly, we provide a successful application of the voracity effect. Thirdly, we contribute to the very sparse literature on Portuguese local fiscal multipliers by estimating an above-one percentual impact of local government expenditure on local firm performance.

Subsequent papers should focus on applying this instrument to other countries, so as to verify the expansion of its applicability. Finally, further delving into the avenues through which local identity spurs government expenditure and the nature of the religious denomination effect constitute two additional and exciting research avenues.

References

[1] Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., Wacziarg, R. (2003). "Fractionalization". Journal of Economic Growth 8: 155-194.

[2] Audretsch, D. B., Gilbert, B. A., McDougall, P. P. (2004). "The Emergence of Entrepreneurship Policy". Small Business Economics 22: 313–23.

[3] Audretsch, D. B., Dohse, D., Pereira dos Santos, J. (2017). "Do toll-free highways foster firm formation and employment growth? Results from a quasi-natural experiment". Kiel Working Paper No. 2080, Kiel Institute for the World Economy (IfW), Kiel.

[4] Auerbach, A. J., Gorodnichenko, Y. (2012). "Measuring the Output Responses to Fiscal Policy". American Economic Journal: Economic Policy 4(2): 1-27.

[5] Auerbach, A. J., Gorodnichenko, Y. (2013). "Fiscal Multipliers in Recession and Expansion". In Alesina, A., Giavazzi, F. (Eds.), "Fiscal Policy after the Financial Crisis": 63-98. University of Chicago Press.

[6] Auerbach, A. J., Gorodnichenko, Y., Murphy, D. (2019). "Local fiscal multipliers and fiscal spillovers in the United States". NBER Working Paper 25457.

[7] Baptista, R., Mendonça, J. (2010). "Proximity to Knowledge Sources and the Location of Knowledge-Based Start-Ups." The Annals of Regional Science 45(1): 5–29.

[8] Bénassy-Quéré, A., Cimadomo, J. (2006). "Changing Patterns of Domestic and Cross-Border Fiscal Policy Multipliers in Europe and in the US". CEPII Working Paper 2006-24.

[9] Brückner, M., Tuladhar, A. (2013). "Local government spending multipliers and financial distress: evidence from Japanese prefectures". The Economic Journal 124: 1279-1316.

[10] Carvalho, B., Franco, F., Peralta, S. (2018). "Finding a local fiscal multiplier: Do local elections matter?". Working paper.

[11] Castro, V., Martins, R. (2013). "Running for office again: evidence from Portuguese municipal elections". Public Choice 156: 677-702.

[12] Cerqua, A., Pellegrini, G. (2018). "Local multipliers at work". MPRA Paper No. 85326.

[13] Chodorow-Reich, G. (2019a). "Geographic Cross-Sectional Fiscal Spending Multipliers: What Have We Learned?". American Economic Journal: Economic Policy 11(2): 1-34.

[14] Chodorow-Reich, G. (2019b). "Regional data in macroeconomics: some advice for practitioners". NBER Working Paper 26501.

[15] Christiano, L., Eichenbaum, M., Rebelo, S. (2011). "When is the Government Multiplier Large?". Journal of Political Economy 119(1): 78-121.

[16] Eggertsson, G.B. (2009). "Can tax cuts deepen recessions?". Federal Reserve Bank of New York (working paper).

[17] Faguet, J.-P. (2014). "Decentralization and Governance." World Development 53: 2-13.

[18] Favero, C., Giavazzi, F., Perego, J. (2011). "Country Heterogeneity and the International Evidence on the Effects of Fiscal Policy". IMF Economic Review 59(4): 652-682.

[19] Fearon, J. D. (2003). "Ethnic and Cultural Diversity by Country". Journal of Economic Growth 8, 195-222.

[20] Fritsch, M., Falck, O. (2007). "New Business Formation by Industry over Space and Time: A Multidimensional Analysis." Regional Studies 41(2): 157–172.

[21] Fritsch, M., Wyrwich, M. (2017). "The effect of entrepreneurship on economic development - an empirical analysis using regional entrepreneurship culture". Journal of Economic Geography 17: 157-189.

[22] Hernández de Cos, P., Moral-Benito, E. (2016). "Fiscal multipliers in turbulent times: the case of Spain". Empirical Economics 50: 1589-1625.

[23] Holl, A. (2004). "Transport Infrastructure, Agglomeration Economies, and Firm Birth: Empirical Evidence from Portugal". Journal of Regional Science 44(4): 693-712.

[24] Ilzetzki, E., Mendoza, E.G., Végh, C.A. (2013). "How big (small?) are fiscal multipliers?". Journal of Monetary Economics 60: 239-254.

[25] Kahn, R.F. (1931). "The Relation of Home Investment to Unemployment". The Economic Journal 41(162): 173-198.

[26] Lopes da Fonseca, M. (2019). "Lame Ducks and Local Fiscal Policy: Quasi-Experimental Evidence from Portugal". The Economic Journal, uez042.

[27] Martin, R., Sunley, P. (2006). "Path dependence and regional economic evolution". Journal of Economic Geography 6: 395-437.

[28] Nakamura, E., Steinsson, J. (2014). "Fiscal Stimulus in a Monetary Union: Evidence from US Regions". American Economic Review 104(3): 753-792.

[29] Pereira dos Santos, J., Tavares, J. (2018). "European Funds and Firm Dynamics: Estimating Spillovers from Increased Access". CEPR Working Paper DP13082.

[30] Pinho, M. M., Veiga, L. G. (2004). "Análise da influência de factores políticos na afectação das transferências intergovernamentais em Portugal". Revista Portuguesa de Estudos Regionais 7: 63-83.

[31] Poot, J. (2000). "A Synthesis of Empirical Research on the Impact of Government on Long-Run Growth". Growth and Change 31: 516-546.

[32] Reynolds, P., Storey, D. J., Westhead, P. (1994). "Cross-National Comparisons of the Variation in New Firm Formation Rates." Regional Studies 28(4): 443–456.

[33] Rickman, D., Wang, H. (2019). "US state and local fiscal policy and economic activity: do we know more now?" Journal of Economic Surveys 00(0): 1-42 [early-view issue].

[34] Santos, J. A. (1995). "As Freguesias - História e Actualidade". Oeiras: Celta Editores.

[35] Shah, A. (2006). "Corruption and Decentralized Public Governance". World Bank Policy Research Working Paper.

[36] Suárez Serrato, J. C., Wingender, P. (2016). "Estimating local fiscal multipliers". NBER Working Paper 22425.

[37] Tagkalakis, A. (2008). "The effects of fiscal policy on consumption in recessions and expansions". Journal of Public Economics 92: 1486-1508.

[38] Tornell, A., Lane, P. R. (1999). "The Voracity Effect". American Economic Review 89(1): 22-46.

[39] Veiga, L. G., Veiga, F. J. (2007). "Political business cycles at the municipal level". Public Choice 131: 45-64.

[40] Woodford, M. (2011). "Simple Analytics of the Government Expenditure Multiplier". American Economic Journal: Macroeconomics 3: 1-35.

Appendix 1: Additional tables

Table A1: Variance-covariance matrix

	# Parishes	*# Rel. Parishes*	ln(*Total Curr Exp*)	ln(*Total Exp*)
# Parishes	1			
# Rel. Parishes	0.618	1		
ln(*Total Curr Exp*)	0.381	0.465	1	
ln(*Total Exp*)	0.424	0.468	0.984	1

Reported estimates are for our regression datasets: *# Parishes* and *# Rel. Parishes* correspond to the values set in 1999, while ln(*Total Curr Exp*) and ln(*Total Exp*) are two-year averages of 2005 and 2006 values, for all 278 mainland municipalities.

Table A2: Reduced-form estimation

	$Y = \ln(Total\,GVA)$		$Y = \ln(Total\,Sales)$	
	(1)	(2)	(3)	(4)
ln(*Total Curr Exp*)	1.336***	1.367***	1.327***	1.395***
	(0.111)	(0.100)	(0.116)	(0.106)
# Parishes	0.005		0.006	
	(0.004)		(0.004)	
# Rel. Parishes		0.009		0.001
		(0.012)		(0.012)
Obs.	277	277	278	278
Adjusted R^2	0.855	0.854	0.858	0.858
ln(*Total Exp*)	1.328***	1.321***	1.328***	1.357***
	(0.118)	(0.104)	(0.123)	(0.110)
# Parishes	0.002		0.003	
	(0.004)		(0.004)	
# Rel. Parishes		0.012		0.004
		(0.012)		(0.013)
Obs.	277	277	278	278
Adjusted R^2	0.845	0.845	0.850	0.850
NUTS2	✓	✓	✓	✓
$Controls_{t-1}$	✓	✓	✓	✓

This table reports the reduced-form OLS estimation, which tentatively investigates if our instruments impact our dependent variables when the expenditure variables are present. The fact that they do not seems to suggest that they are adequate choices for an IV framework. Standard errors in parentheses are clustered at the municipal level and are robust to heteroscedasticity. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***).

Table A3: Baseline results (weighted by municipality population)

	$Y = \ln(Total\,GVA)$			$Y = \ln(Total\,Sales)$		
	OLS	IV $\#\,Parishes$	IV $\#\,Rel.\,Parishes$	OLS	IV $\#\,Parishes$	IV $\#\,Rel.\,Parishes$
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(Total\,Curr\,Exp)$	1.373***	1.516***	1.480***	1.372***	1.540***	1.409***
	(0.086)	(0.119)	(0.145)	(0.091)	(0.116)	(0.146)
Obs.	277	277	277	278	278	278
$Adjusted\,R^2$	0.861	0.859	0.860	0.864	0.861	0.864
First-stage instrument		0.025***	0.068***		0.025***	0.068***
		(0.003)	(0.009)		(0.003)	(0.009)
First-stage F test		89.56	60.80		89.74	60.77
$\ln(Total\,Exp)$	1.340***	1.409***	1.467***	1.347***	1.432***	1.397***
	(0.086)	(0.112)	(0.140)	(0.090)	(0.108)	(0.140)
Obs.	277	277	277	278	278	278
$Adjusted\,R^2$	0.853	0.852	0.851	0.857	0.856	0.857
First-stage instrument		0.027***	0.069***		0.027***	0.069***
		(0.003)	(0.008)		(0.003)	(0.008)
First-stage F test		100.89	67.46		101.03	67.42
NUTS2	✓	✓	✓	✓	✓	✓
$Controls_{t-1}$	✓	✓	✓	✓	✓	✓
Inst.: $\#\,Parishes$		✓			✓	
Inst.: $\#\,Rel.\,Parishes$			✓			✓

NUTS2 (in their 2002 version) refers to the used geographical control variable - the Portuguese mainland regions (5 in number: Norte, Centro, Lisboa, Alentejo and Algarve). The reported IV estimations are weighted by municipality population. Standard errors in parentheses are clustered at the municipal level and are robust to heteroscedasticity. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***).

Table A4: Descriptive statistics, regional development

Variable	Observations	Mean	Std. Dev.	Min	Max
Full dataset					
$\ln(Total\,GVA)$	277	0.423	0.184	0	1
$\ln(Total\,Sales)$	278	0.404	0.188	0	1
Lisbon metropolitan area					
$\ln(Total\,GVA)$	18	0.697	0.133	0.492	1
$\ln(Total\,Sales)$	18	0.69	0.139	0.494	1
Porto metropolitan area					
$\ln(Total\,GVA)$	16	0.66	0.098	0.468	0.814
$\ln(Total\,Sales)$	16	0.648	0.102	0.44	0.799
Coastal municipalities					
$\ln(Total\,GVA)$	52	0.58	0.155	0.271	1
$\ln(Total\,Sales)$	52	0.562	0.159	0.225	1

This table presents descriptive statistics for the baseline timeframe, normalized to range from 0 to 1, for the full sample and the excluded municipalities in Tables 5 and 6.

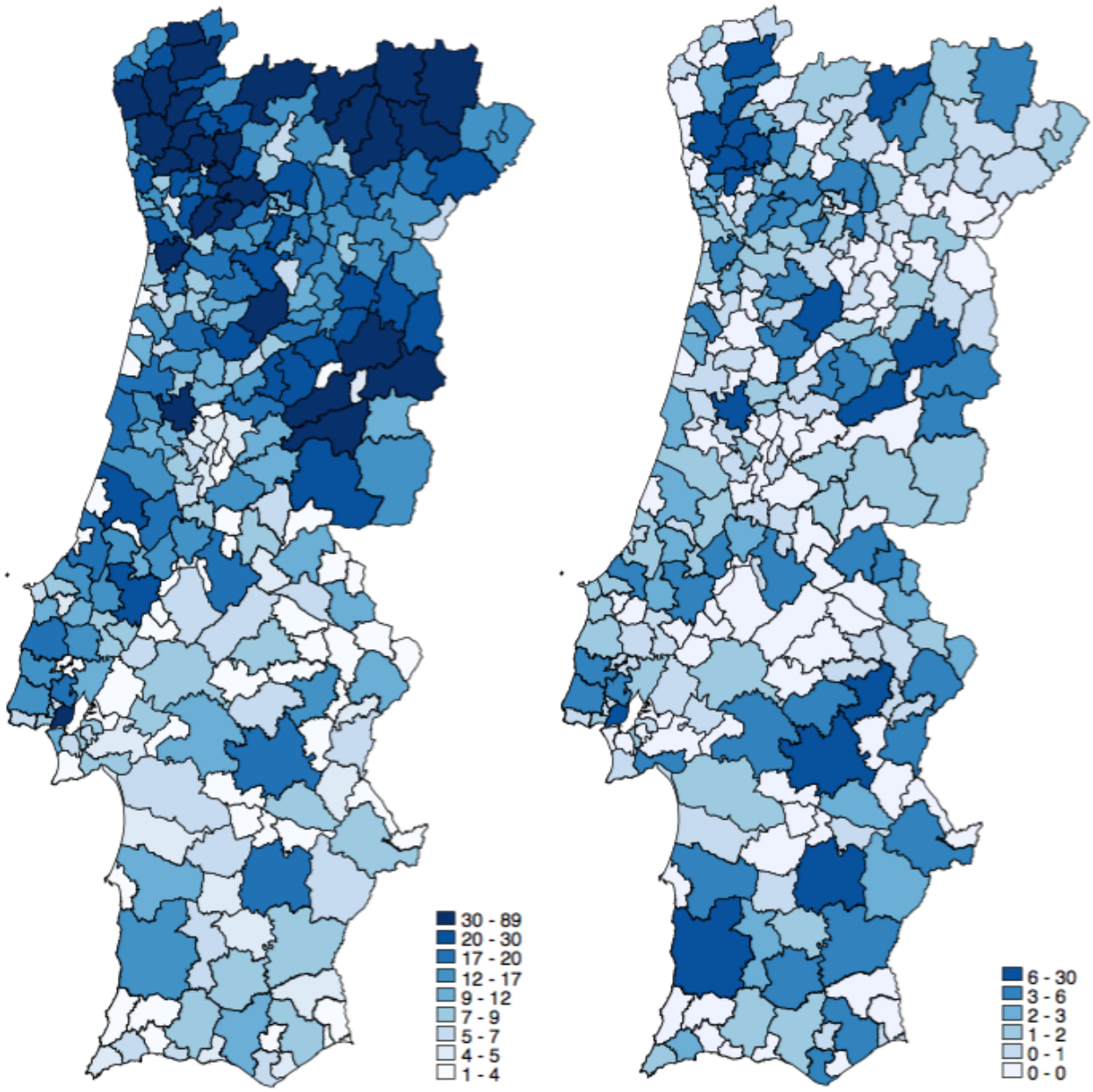
Table A5: Descriptive statistics, 09-12 timeframe

Variable	Observations	Mean	Std. Dev.	Min	Max
Private Firm Performance (2011-12 averages)					
$\ln(Total\,GVA)$	278	17.444	1.576	13.334	22.485
$\ln(Total\,Sales)$	278	18.945	1.594	14.618	24.111
Municipal Expenditure (2009-10 averages)					
$\ln(Total\,Curr\,Exp)$	278	9.337	0.814	7.944	13.021
$\ln(Total\,Exp)$	278	9.757	0.785	8.359	13.269
Instruments (1999 values)					
# Parishes	278	14.522	12.772	1	89
# Rel. Parishes	278	2.259	3.293	0	30
Controls (2009-10 averages)					
Total Urban Area	278	11.387	14.796	0.334	91.279
Electricity Cons.	278	4274.38	4663.8	1569.905	60442.36
IMI	278	0.646	0.086	0.4	0.7
Industrial Area	278	0.014	0.023	0	0.15
Unemp. Rate	278	7.16	2.208	2.445	16.319
Highways	278	0.552	0.497	0	1
Tertiary Educ.	278	0.075	0.032	0.026	0.29
Pop. Density	278	0.311	0.836	0.005	7.154
Leftist Mandates	278	0.558	0.247	0	1
Mayor Majority	278	0.896	0.222	0	1
Business Tax Rate	278	0.008	0.007	0	0.015

This table presents descriptive statistics for Table 7's dataset - the 2009-2012 timeframe.

Appendix 2: Figures

Figure A1: Number of parishes (left) and religiously-denominated parishes (right) per municipality (1999)



While clustering of # *Parishes* is present in the north of the territory, notice how this all but dissipates for # *Rel. Parishes*.

Appendix 3: Municipality list

Municipality	*# Parishes*	*# Rel. Parishes*	Lisbon Metr. Area	Porto Metr. Area	Coastal
Abrantes	19	4	No	No	No
Águeda	20	0	No	No	No
Aguiar da Beira	13	0	No	No	No
Alandroal	6	6	No	No	No
Albergaria-a-Velha	8	1	No	No	No
Albufeira	5	0	No	No	Yes
Alcácer do Sal	6	2	No	No	Yes
Alcanena	10	2	No	No	No
Alcobaça	19	2	No	No	Yes
Alcochete	3	0	Yes	No	No
Alcoutim	5	0	No	No	No
Alenquer	16	1	No	No	No
Alfândega da Fé	20	1	No	No	No
Alijó	19	2	No	No	No
Aljezur	4	0	No	No	Yes
Aljustrel	5	1	No	No	No
Almada	11	0	Yes	No	Yes
Almeida	29	1	No	No	No
Almeirim	4	0	No	No	No
Almodôvar	8	4	No	No	No
Alpiarça	1	0	No	No	No
Alter do Chão	4	0	No	No	No
Alvaiázere	7	0	No	No	No
Alvito	2	0	No	No	No
Amadora	11	1	Yes	No	No
Amarante	40	4	No	No	No
Amares	24	2	No	No	No
Anadia	15	1	No	No	No
Ansião	8	1	No	No	No
Arcos de Valdevez	51	8	No	No	No
Arganil	18	1	No	No	No
Armamar	19	6	No	No	No
Arouca	20	2	No	Yes	No
Arraiolos	7	4	No	No	No
Arronches	3	2	No	No	No
Arruda dos Vinhos	4	1	No	No	No
Aveiro	14	5	No	No	Yes
Avis	8	0	No	No	No
Azambuja	9	1	No	No	No
Baião	20	3	No	No	No
Barcelos	89	15	No	No	No
Barrancos	1	0	No	No	No

Municipality	# *Parishes*	# *Rel. Parishes*	Lisbon Metr. Area	Porto Metr. Area	Coastal
Barreiro	8	2	Yes	No	No
Batalha	4	1	No	No	No
Beja	18	9	No	No	No
Belmonte	5	0	No	No	No
Benavente	4	1	No	No	No
Bombarral	5	0	No	No	No
Borba	4	1	No	No	No
Boticas	16	1	No	No	No
Braga	62	15	No	No	No
Bragança	49	5	No	No	No
Cabeceiras de Basto	17	0	No	No	No
Cadaval	10	0	No	No	No
Caldas da Rainha	16	4	No	No	Yes
Caminha	20	1	No	No	Yes
Campo Maior	3	3	No	No	No
Cantanhede	19	1	No	No	Yes
Carrazeda de Ansiães	19	0	No	No	No
Carregal do Sal	7	0	No	No	No
Cartaxo	8	0	No	No	No
Cascais	6	1	Yes	No	Yes
Castanheira de Pera	2	0	No	No	No
Castelo Branco	25	2	No	No	No
Castelo de Paiva	9	2	No	No	No
Castelo de Vide	4	4	No	No	No
Castro Daire	22	1	No	No	No
Castro Marim	4	0	No	No	No
Castro Verde	5	2	No	No	No
Celorico da Beira	22	2	No	No	No
Celorico de Basto	22	2	No	No	No
Chamusca	7	0	No	No	No
Chaves	50	7	No	No	No
Cinfães	17	2	No	No	No
Coimbra	31	11	No	No	No
Condeixa-a-Nova	10	1	No	No	No
Constância	3	1	No	No	No
Coruche	8	2	No	No	No
Covilhã	31	7	No	No	No
Crato	6	0	No	No	No
Cuba	4	0	No	No	No
Elvas	11	6	No	No	No
Entroncamento	1	0	No	No	No
Espinho	5	0	No	Yes	Yes
Esposende	15	0	No	No	Yes
Estarreja	7	0	No	No	No

Municipality	# *Parishes*	# *Rel. Parishes*	Lisbon Metr. Area	Porto Metr. Area	Coastal
Estremoz	13	10	No	No	No
Évora	19	14	No	No	No
Fafe	36	5	No	No	No
Faro	6	4	No	No	Yes
Felgueiras	32	2	No	No	No
Ferreira do Alentejo	6	0	No	No	No
Ferreira do Zêzere	9	1	No	No	No
Figueira da Foz	18	3	No	No	Yes
Figueira de Castelo Rodrigo	17	0	No	No	No
Figueiró dos Vinhos	5	0	No	No	No
Fornos de Algodres	16	0	No	No	No
Freixo de Espada à Cinta	6	0	No	No	No
Fronteira	3	1	No	No	No
Fundão	31	0	No	No	No
Gavião	5	0	No	No	No
Góis	5	0	No	No	No
Golegã	2	0	No	No	No
Gondomar	12	2	No	Yes	No
Gouveia	22	3	No	No	No
Grândola	5	1	No	No	Yes
Guarda	56	7	No	No	No
Guimarães	68	22	No	No	No
Idanha-a-Nova	17	2	No	No	No
Ílhavo	4	2	No	No	Yes
Lagoa	6	0	No	No	Yes
Lagos	6	3	No	No	Yes
Lamego	24	2	No	No	No
Leiria	29	3	No	No	Yes
Lisboa	53	30	Yes	No	Yes
Loulé	11	2	No	No	Yes
Loures	18	5	Yes	No	No
Lourinhã	11	2	No	No	Yes
Lousã	5	0	No	No	No
Lousada	25	3	No	No	No
Mação	8	0	No	No	No
Macedo de Cavaleiros	38	1	No	No	No
Mafra	17	6	Yes	No	Yes
Maia	17	3	No	Yes	No
Mangualde	18	2	No	No	No
Manteigas	3	2	No	No	No
Marco de Canaveses	31	4	No	No	No
Marinha Grande	2	0	No	No	Yes
Marvão	4	3	No	No	No
Matosinhos	10	3	No	Yes	Yes

Municipality	# *Parishes*	# *Rel. Parishes*	Lisbon Metr. Area	Porto Metr. Area	Coastal
Mealhada	8	0	No	No	No
Mêda	16	0	No	No	No
Melgaço	18	1	No	No	No
Mértola	9	6	No	No	No
Mesão Frio	7	2	No	No	No
Mira	4	0	No	No	Yes
Miranda do Corvo	5	0	No	No	No
Miranda do Douro	16	2	No	No	No
Mirandela	37	2	No	No	No
Mogadouro	28	1	No	No	No
Moimenta da Beira	20	0	No	No	No
Moita	6	0	Yes	No	No
Monção	33	0	No	No	No
Monchique	3	0	No	No	No
Mondim de Basto	8	0	No	No	No
Monforte	4	1	No	No	No
Montalegre	35	2	No	No	No
Montemor-o-Novo	10	4	No	No	No
Montemor-o-Velho	14	1	No	No	No
Montijo	8	1	Yes	No	No
Mora	4	0	No	No	No
Mortágua	10	0	No	No	No
Moura	8	5	No	No	No
Mourão	3	0	No	No	No
Murça	9	0	No	No	No
Murtosa	4	0	No	No	Yes
Nazaré	3	1	No	No	Yes
Nelas	9	0	No	No	No
Nisa	10	5	No	No	No
Óbidos	9	2	No	No	Yes
Odemira	15	7	No	No	Yes
Odivelas	7	1	Yes	No	No
Oeiras	9	2	Yes	No	Yes
Oleiros	12	2	No	No	No
Olhão	5	0	No	No	Yes
Oliveira de Azeméis	19	3	No	Yes	No
Oliveira de Frades	12	3	No	No	No
Oliveira do Bairro	6	0	No	No	No
Oliveira do Hospital	21	4	No	No	No
Ourém	18	2	No	No	No
Ourique	6	3	No	No	No
Ovar	8	2	No	No	Yes
Paços de Ferreira	16	0	No	No	No
Palmela	5	0	Yes	No	No

Municipality	# *Parishes*	# *Rel. Parishes*	Lisbon Metr. Area	Porto Metr. Area	Coastal
Pampilhosa da Serra	10	0	No	No	No
Paredes	24	1	No	Yes	No
Paredes de Coura	21	0	No	No	No
Pedrogão Grande	3	1	No	No	No
Penacova	11	2	No	No	No
Penafiel	38	6	No	No	No
Penalva do Castelo	13	0	No	No	No
Penamacor	12	4	No	No	No
Penedono	9	0	No	No	No
Penela	6	2	No	No	No
Peniche	6	2	No	No	Yes
Peso da Régua	12	0	No	No	No
Pinhel	27	1	No	No	No
Pombal	17	2	No	No	Yes
Ponte da Barca	25	6	No	No	No
Ponte de Lima	51	3	No	No	No
Ponte de Sor	7	0	No	No	No
Portalegre	10	3	No	No	No
Portel	8	3	No	No	No
Portimão	3	0	No	No	Yes
Porto	15	3	No	Yes	Yes
Porto de Mós	13	3	No	No	No
Póvoa de Lanhoso	29	3	No	No	No
Póvoa de Varzim	12	0	No	Yes	Yes
Proença-a-Nova	6	2	No	No	No
Redondo	2	0	No	No	No
Reguengos de Monsaraz	5	0	No	No	No
Resende	15	4	No	No	No
Ribeira de Pena	7	2	No	No	No
Rio Maior	14	3	No	No	No
Sabrosa	15	4	No	No	No
Sabugal	40	5	No	No	No
Salvaterra de Magos	6	0	No	No	No
Santa Comba Dão	9	4	No	No	No
Santa Maria da Feira	31	4	No	Yes	No
Santa Marta de Penaguião	10	2	No	No	No
Santarém	28	4	No	No	No
Santiago do Cacém	11	6	No	No	Yes
Santo Tirso	24	7	No	Yes	No
Sao Brás de Alportel	1	1	No	No	No
São João da Madeira	1	1	No	Yes	No
São João da Pesqueira	14	1	No	No	No
São Pedro do Sul	19	6	No	No	No
Sardoal	4	1	No	No	No

Municipality	# *Parishes*	# *Rel. Parishes*	Lisbon Metr. Area	Porto Metr. Area	Coastal
Sátão	12	1	No	No	No
Seia	29	6	No	No	No
Seixal	6	0	Yes	No	No
Sernancelhe	17	0	No	No	No
Serpa	7	3	No	No	No
Sertã	14	0	No	No	No
Sesimbra	3	1	Yes	No	Yes
Setúbal	8	6	Yes	No	Yes
Sever do Vouga	9	0	No	No	No
Silves	8	2	No	No	Yes
Sines	2	0	No	No	Yes
Sintra	17	6	Yes	No	Yes
Sobral de Monte Agraço	3	1	No	No	No
Soure	12	0	No	No	No
Sousel	4	1	No	No	No
Tábua	15	1	No	No	No
Tabuaço	17	1	No	No	No
Tarouca	10	1	No	No	No
Tavira	9	6	No	No	Yes
Terras de Bouro	17	0	No	No	No
Tomar	16	3	No	No	No
Tondela	26	6	No	No	No
Torre de Moncorvo	17	0	No	No	No
Torres Novas	16	4	No	No	No
Torres Vedras	20	2	No	No	Yes
Trancoso	29	2	No	No	No
Trofa	8	4	No	Yes	No
Vagos	11	3	No	No	Yes
Vale de Cambra	9	1	No	No	No
Valença	16	2	No	No	No
Valongo	5	0	No	Yes	No
Valpaços	31	5	No	No	No
Vendas Novas	2	0	No	No	No
Viana do Alentejo	3	0	No	No	No
Viana do Castelo	40	0	No	No	Yes
Vidigueira	4	1	No	No	No
Vieira do Minho	21	1	No	No	No
Vila de Rei	3	1	No	No	No
Vila do Bispo	5	2	No	No	Yes
Vila do Conde	30	0	No	Yes	Yes
Vila Flor	19	1	No	No	No
Vila Franca de Xira	11	2	Yes	No	No
Vila Nova da Barquinha	5	0	No	No	No
Vila Nova de Cerveira	15	0	No	No	No

Municipality	*# Parishes*	*# Rel. Parishes*	Lisbon Metr. Area	Porto Metr. Area	Coastal
Vila Nova de Famalicão	49	10	No	No	No
Vila Nova de Foz Côa	17	2	No	No	No
Vila Nova de Gaia	24	2	No	Yes	Yes
Vila Nova de Paiva	7	0	No	No	No
Vila Nova de Poiares	4	2	No	No	No
Vila Pouca de Aguiar	17	1	No	No	No
Vila Real	30	4	No	No	No
Vila Real de Santo António	3	1	No	No	Yes
Vila Velha de Rodão	4	0	No	No	No
Vila Verde	58	11	No	No	No
Vila Viçosa	5	1	No	No	No
Vimioso	14	1	No	No	No
Vinhais	35	2	No	No	No
Viseu	34	8	No	No	No
Vizela	7	5	No	No	No
Vouzela	12	1	No	No	No

This table presents all 278 Portuguese mainland municipalities, which constitute our sample. Of these, 34 are included in the Lisbon (18) and Porto (16) metropolitan areas and 52 are coastal. Parishes correspond to their pre-2013 organization, 4037 in number, 628 of which display a religious denomination.