

GEE Paper

151

Junho de 2020



Public Expenditure and private firm performance: using religious denominations for causal inference

**Henrique Alpalhão | Marta Lopes | João Pereira dos
Santos | José Tavares**



Public Expenditure and private firm performance: using religious denominations for causal inference ¹

Henrique Alpalhão², Marta Lopes³, João Pereira dos Santos⁴, José Tavares⁵

Abstract:

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.

JEL Classification Codes: D72; E62; H72

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

Note: This article is the sole responsibility of the authors and does not necessarily reflect the positions of GEE or the Portuguese Ministry of Economy.

¹This work received financial support from Fundação para a Ciência e Tecnologia (PTDC/EGE-ECO/31213/2017). The authors are indebted to Luís Catela Nunes, Erich Gundlach, Paulo Rodrigues, Ron Smith, Alexandre Mendonça and attendees of the 13th.

²Nova SBE (henrique.alpalhao@novasbe.pt)

³(marta.lopes93@hotmail.com)

⁴Nova SBE (joao.santos@novasbe.pt)

⁵Nova SBE and CEPR (jtavares@novasbe.pt)

Contents

1	Introduction	1
2	Literature review	2
3	Local governments in Portugal	4
3.1	Municipalities	4
3.2	Parishes	5
4	The instrument	5
4.1	Number of parishes	6
4.2	Number of religiously denominated parishes	7
5	Empirical strategy and data	8
6	Results	11
6.1	Baseline	11
7	Robustness	13
8	Concluding remarks	16
9	References	17
10	Appendix 1: Additional tables	21
11	Appendix 2: Figures	25
12	Appendix 3: Municipality list	26

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 country⁶ 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.⁷ 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).

⁶Rickman 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”.

⁷Fearon (2003) ranks Portugal as the second least fractionalized country among western countries and Japan; Alesina et al. (2003) obtain equivalent results.

Using these instruments for two expenditure aggregates across Portuguese municipalities⁸, 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 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), Bénassy-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.⁹

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.¹⁰ 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; Suarez Serrato and Wingdener, 2016). For the US, both Suarez Serrato and Wingdener (2016) and Auerbach et al. (2019) find a sizable impact of local expenditure on regional economic outcomes.

⁸For a wider study on the impact of regional borders on European economies, refer to Capello et al. (2018)

⁹Hernandez 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.

¹⁰Such as the legal and cultural context.

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 constraints, 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.

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 Suarez-Villa 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.¹¹ 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.¹² 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 by transfers (and increasingly so, in the case of current revenues).¹³ 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.

¹¹See 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.

¹²Note how this allows for discretionary allocation of transfers to specific municipalities.

¹³See also Pereira dos Santos and Tavares (2018) for insight on the role of European funds in local budgets.

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).¹⁴ 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,¹⁵ 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 (Suarez Serrato and Wingender, 2016);¹⁶ 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.

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

¹⁴Appendix 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.

¹⁵Which include those related to local markets and fairs, cemeteries, public and administrative services and pet licensing.

¹⁶Who, 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.

expenditure with its lags or differences), is argued to potentially suffer from analogous issues.¹⁷

The best way of dealing with these concerns, hence, seems to be the use of an instrumental variable for government expenditure.¹⁸ 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.¹⁹

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.²⁰ 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,²¹ 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. However, the specific tasks of parishes,²² while not numerous, comprise investment and infrastructure maintenance, for example. This may give them the power to influence both the

¹⁷Rickman 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”. Brckner and Tuladhar (2013), for example, use system-GMM.

¹⁸This strategy is adopted on numerous articles regarding local fiscal multipliers, such as Suarez Serrato and Wingender (2016), Cerqua and Pellegrini (2018), Chodorow-Reich (2019a) or Auerbach et al. (2019).

¹⁹Note 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.

²⁰Note, 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.

²¹Which 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.

²²As discussed in section 3.

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 in line with 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.²³ Comparisons can also be drawn between our second instrument and that of de Vaan et al. (2019), who use social capital (measured as civic engagement) as a gauge for conformity in values and ideas.

Indeed, in Table 1 we find that, using a simple OLS for a panel of 4034 of the 4037²⁴ mainland parishes from 2003 to 2012, religious denominations do explain received transfers positively and significantly.²⁵

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

²³The 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).

²⁴No data on received transfers is available for the missing 3 - Vale de Amoreira, Moita and Agualva-Cacém.

²⁵Additionally, 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**

	$Y = \ln(\text{Total Parish Transfers})$				
	(1)	(2)	(3)	(4)	(5)
<i>Religiously Named</i>	0.088*** (0.033)	0.088*** (0.033)	0.062** (0.030)	0.062** (0.030)	0.060** (0.027)
Obs.	40†340	40†340	40†340	40†340	40†340
<i>Adjusted R²</i>	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% (***).

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 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 2006.²⁶ 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 other covariates are the average of their 2005 and 2006 values.²⁷ 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,²⁸ 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,²⁹ the local property (*IMI*) and business tax (*derrama*) rates,³⁰ the prevalence of industrial areas,³¹ and the presence of a nearby highway connection.³² We further include the total urban area of each municipality and per capita electricity consumption as a measure of regional development and income.

²⁶This 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.

²⁷As mentioned before, the instruments correspond to 1999 values.

²⁸Which is achieved through the combined inclusion of this variable and the instrument.

²⁹As 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.

³⁰In line with Brückner and Tuladhar, 2013, who use local tax revenues.

³¹In 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.

³²As found by Holl (2004) and Audretsch et al. (2017) for Portuguese municipalities.

Table 2. **Descriptive statistics**

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

$\ln(\text{Total GVA})$ 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.

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 jurisdiction³³ and the existence of a majority in the town hall,³⁴ 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).³⁵ 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.

³³In 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.

³⁴In line with Carvalho et al., 2018.

³⁵Additionally, Fritsch and Falck (2007) put forward that a high level of short-term unemployment has a positive impact on the number of start-ups.

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.³⁶ 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 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.

³⁶Table 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).

Table 3. **Baseline results (unweighted)**

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

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% (***).

Table 4. **Robustness tests: region fixed effects**

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

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, Covado, 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% (***).

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

Table 5. **Robustness tests: no metropolitan areas**

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

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, S. 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**

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

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, Ólhavo, Vagos, Mira, Cantanhede, Figueira da Foz, Pombal, Leiria, Marinha Grande, Alcobaça, Nazaré, Caldas da Rainha, Ílhavo, Peniche, Lourinhã, Torres Vedras, Mafra, Sintra, Cascais, Oeiras, Lisboa, Almada, Sesimbra, Setúbal, Alentejo, 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**

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

These estimations correspond to those in Table 3 using a different timeframe - $\ln(\text{Total GVA})$ and $\ln(\text{Total Sales})$ 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% (***).

results' robustness to different years of analysis by delving deeper into the crisis setting.³⁷

All estimations, as these tables show, retain previous conclusions: both instruments are highly significant, $\# \text{ Rel. Parishes}$ displays higher power than $\# \text{ Parishes}$ 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 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.

³⁷Descriptive statistics for this dataset are included in the appendix, in Table A5.

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.

9. References

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”. CEPR 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] Capello, R., Caragliu, A., Fratesi, U. (2018). “Breaking Down the Border: Physical, Institutional and Cultural Obstacles”. *Economic Geography* 94(5): 485-513.
- [11] Carvalho, B., Franco, F., Peralta, S. (2018). “Finding a local fiscal multiplier: Do local elections matter?”. Working paper.
- [12] Castro, V., Martins, R. (2013). “Running for office again: evidence from Portuguese municipal elections”. *Public Choice* 156: 677-702.
- [13] Cerqua, A., Pellegrini, G. (2018). “Local multipliers at work”. MPRA Paper No. 85326.
- [14] Chodorow-Reich, G. (2019a). “Geographic Cross-Sectional Fiscal Spending Multipliers: What Have We Learned?”. *American Economic Journal: Economic Policy* 11(2): 1-34.
- [15] Chodorow-Reich, G. (2019b). “Regional data in macroeconomics: some advice for practitioners”. NBER Working Paper 26501.
- [16] Christiano, L., Eichenbaum, M., Rebelo, S. (2011). “When is the Government Multiplier Large?”. *Journal of Political Economy* 119(1): 78-121.
- [17] de Vaan, M., Frenken, K., Boschma, R. (2019). “The Downside of Social Capital in New Industry Creation”. *Economic Geography* 95(4): 315-340.
- [18] Eggertsson, G.B. (2009). “Can tax cuts deepen recessions?”. Federal Reserve Bank of New York (working paper).
- [19] Faguet, J.-P. (2014). “Decentralization and Governance.” *World Development* 53: 2-13.
- [20] 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.
- [21] Fearon, J. D. (2003). “Ethnic and Cultural Diversity by Country”. *Journal of Economic Growth* 8, 195-222.
- [22] Fritsch, M., Falck, O. (2007). “New Business Formation by Industry over Space and Time: A Multidimensional Analysis.” *Regional Studies* 41(2): 157–172.
- [23] 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.

- [24] Hernández de Cos, P., Moral-Benito, E. (2016). “Fiscal multipliers in turbulent times: the case of Spain”. *Empirical Economics* 50: 1589-1625.
- [25] Holl, A. (2004). “Transport Infrastructure, Agglomeration Economies, and Firm Birth: Empirical Evidence from Portugal”. *Journal of Regional Science* 44(4): 693-712.
- [26] Ilzetzki, E., Mendoza, E.G., Végh, C.A. (2013). “How big (small?) are fiscal multipliers?”. *Journal of Monetary Economics* 60: 239-254.
- [27] Kahn, R.F. (1931). “The Relation of Home Investment to Unemployment”. *The Economic Journal* 41(162): 173-198.
- [28] Lopes da Fonseca, M. (2019). “Lame Ducks and Local Fiscal Policy: Quasi-Experimental Evidence from Portugal”. *The Economic Journal*, euz042.
- [29] Martin, R., Sunley, P. (2006). “Path dependence and regional economic evolution”. *Journal of Economic Geography* 6: 395-437.
- [30] Nakamura, E., Steinsson, J. (2014). “Fiscal Stimulus in a Monetary Union: Evidence from US Regions”. *American Economic Review* 104(3): 753-792.
- [31] Pereira dos Santos, J., Tavares, J. (2018). “European Funds and Firm Dynamics: Estimating Spillovers from Increased Access”. CEPR Working Paper DP13082.
- [32] 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.
- [33] Poot, J. (2000). “A Synthesis of Empirical Research on the Impact of Government on Long-Run Growth”. *Growth and Change* 31: 516-546.
- [34] 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.
- [35] 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].
- [36] Santos, J. A. (1995). “As Freguesias - História e Actualidade”. Oeiras: Celta Editores.
- [37] Shah, A. (2006). “Corruption and Decentralized Public Governance”. World Bank Policy Research Working Paper.
- [38] Suarez Serrato, J. C., Wingender, P. (2016). “Estimating local fiscal multipliers”. NBER Working Paper 22425.
- [39] Tagkalakis, A. (2008). “The effects of fiscal policy on consumption in recessions and expansions”. *Journal of Public Economics* 92: 1486-1508.
- [40] Tornell, A., Lane, P. R. (1999). “The Voracity Effect”. *American Economic Review* 89(1): 22-46.
- [41] Veiga, L. G., Veiga, F. J. (2007). “Political business cycles at the municipal level”. *Public Choice* 131: 45-64.

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

10. Appendix 1: Additional tables

Table A1: Variance-covariance matrix

	<i># Parishes</i>	<i># Rel. Parishes</i>	$\ln(\text{Total Curr Exp})$	$\ln(\text{Total Exp})$
<i># Parishes</i>	1			
<i># Rel. Parishes</i>	0.618	1		
$\ln(\text{Total Curr Exp})$	0.381	0.465	1	
$\ln(\text{Total Exp})$	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 $\ln(\text{Total Curr Exp})$ and $\ln(\text{Total Exp})$ are two-year averages of 2005 and 2006 values, for all 278 mainland municipalities.

Table A2: Reduced-form estimation

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

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

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					
$\ln(\text{Total GVA})$	277	0.423	0.184	0	1
$\ln(\text{Total Sales})$	278	0.404	0.188	0	1
Lisbon metropolitan area					
$\ln(\text{Total GVA})$	18	0.697	0.133	0.492	1
$\ln(\text{Total Sales})$	18	0.69	0.139	0.494	1
Porto metropolitan area					
$\ln(\text{Total GVA})$	16	0.66	0.098	0.468	0.814
$\ln(\text{Total Sales})$	16	0.648	0.102	0.44	0.799
Coastal municipalities					
$\ln(\text{Total GVA})$	52	0.58	0.155	0.271	1
$\ln(\text{Total Sales})$	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.

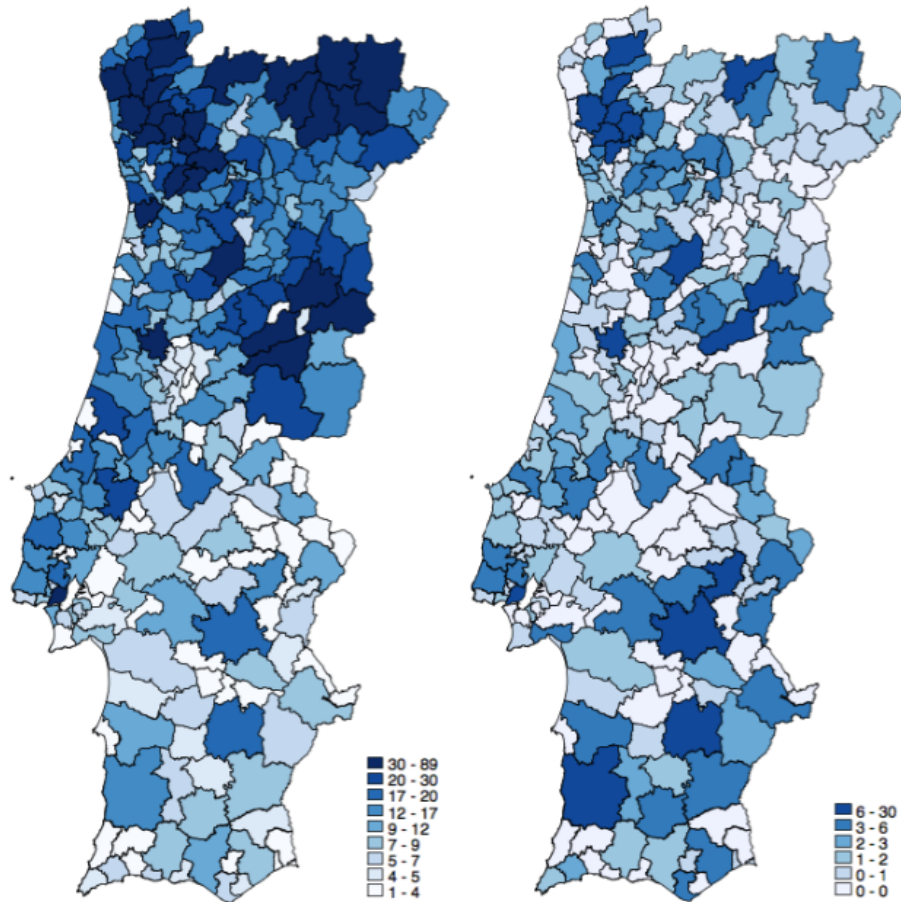
Table A5: Descriptive statistics, 09-12 timeframe

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

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

11. 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*.

12. Appendix 3: Municipality list

Municipality	# Parishes	# Rel. Parishes	Lisbon Metr. Area	Porto Metr. Area	Coastal
Abrantes	19	4	No	No	No
Agueda	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
Alcacer 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
Alvaiade	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

Municipality	# Parishes	# Rel. Parishes	Lisbon Metr. Area	Porto Metr. Area	Coastal
Barcelos	89	15	No	No	No
Barrancos	1	0	No	No	No
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
Bragan�a	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 Ansi�es	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
Cinf�es	17	2	No	No	No
Coimbra	31	11	No	No	No
Condeixa-a-Nova	10	1	No	No	No
Const�ncia	3	1	No	No	No
Coruche	8	2	No	No	No
Covilh�	31	7	No	No	No
Crato	6	0	No	No	No
Cuba	4	0	No	No	No
Elvas	11	6	No	No	No

Municipality	# Parishes	# Rel. Parishes	Lisbon Metr. Area	Porto Metr. Area	Coastal
Entroncamento	1	0	No	No	No
Espinho	5	0	No	Yes	Yes
Esposende	15	0	No	No	Yes
Estarreja	7	0	No	No	No
Estremoz	13	10	No	No	No
...vora	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 ZÍzere	9	1	No	No	No
Figueira da Foz	18	3	No	No	Yes
Figueira de Castelo Rodrigo	17	0	No	No	No
FigueirÛ dos Vinhos	5	0	No	No	No
Fornos de Algodres	16	0	No	No	No
Freixo de Espada ‡ Cinta	6	0	No	No	No
Fronteira	3	1	No	No	No
Fund,,o	31	0	No	No	No
Gavi,,o	5	0	No	No	No
GÛis	5	0	No	No	No
Goleg,,	2	0	No	No	No
Gondomar	12	2	No	Yes	No
Gouveia	22	3	No	No	No
Gr,,ndola	5	1	No	No	Yes
Guarda	56	7	No	No	No
Guimar,,es	68	22	No	No	No
Idanha-a-Nova	17	2	No	No	No
Ûlhavo	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
LoulË	11	2	No	No	Yes
Loures	18	5	Yes	No	No
Lourinh,,	11	2	No	No	Yes
Lous,,	5	0	No	No	No
Lousada	25	3	No	No	No
MaÁ,,o	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

Municipality	# Parishes	# Rel. Parishes	Lisbon Metr. Area	Porto Metr. Area	Coastal
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
Marvã	4	3	No	No	No
Matosinhos	10	3	No	Yes	Yes
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
Nóvicos	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

Municipality	# Parishes	# Rel. Parishes	Lisbon Metr. Area	Porto Metr. Area	Coastal
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
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

Municipality	# Parishes	# Rel. Parishes	Lisbon Metr. Area	Porto Metr. Area	Coastal
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
São 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
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
Sertão	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
Valençã	16	2	No	No	No
Valongo	5	0	No	Yes	No
Valpaços	31	5	No	No	No

Municipality	# Parishes	# Rel. Parishes	Lisbon Metr. Area	Porto Metr. Area	Coastal
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
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.

GEE Papers

- 1: Evolução do Comércio Externo Português de Exportação (1995-2004)
[João Ferreira do Amaral](#)
- 2: Nowcasting an Economic Aggregate with Disaggregate Dynamic Factors: An Application to Portuguese GDP
[Antonio Morgado](#) | [Luis Nunes](#) | [Susana Salvado](#)
- 3: Are the Dynamics of Knowledge-Based Industries Any Different?
[Ricardo Mamede](#) | [Daniel Mota](#) | [Manuel Godinho](#)
- 4: Competitiveness and convergence in Portugal
[Jorge Braga de Macedo](#)
- 5: Produtividade, Competitividade e Quotas de Exportação
[Jorge Santos](#)
- 6: Export Diversification and Technological Improvement: Recent Trends in the Portuguese Economy
[Manuel Cabral](#)
- 7: Election Results and Opportunistic Policies: An Integrated Approach
[Toke Aidt](#) | [Francisco Veiga](#) | [Linda Veiga](#)
- 8: Behavioural Determinants of Foreign Direct Investment
[Ricardo Pinheiro-Alves](#)
- 9: Structural Transformation and the role of Foreign Direct Investment in Portugal: a descriptive analysis for the period 1990-2005
[Miguel de Freitas](#) | [Ricardo Mamede](#)
- 10: Productive experience and specialization opportunities for Portugal: an empirical assessment
[Miguel de Freitas](#) | [Susana Salvado](#) | [Luis Nunes](#) | [Rui Costa Neves](#)
- 11: The Portuguese Active Labour Market Policy during the period 1998-2003 - A Comprehensive Conditional Difference-In-Differences Application
[Alcina Nunes](#) | [Paulino Teixeira](#)
- 12: Fiscal Policy in a Monetary Union: Gains from Changing Institutions
[Susana Salvado](#)
- 13: Coordination and Stabilization Gains of Fiscal Policy in a Monetary Union
[Susana Salvado](#)
- 14: The Relevance of Productive Experience in the Process of Economic Growth: an Empirical Study
[Diana Vieira](#)
- 15: Employment and Exchange rates: the Role of Openness and Technology
[Fernando Alexandre](#) | [Pedro Bação](#) | [João Cerejeira](#) | [Miguel Portela](#)
- 16: Aggregate and sector-specific exchange rate indexes for the Portuguese economy
[Fernando Alexandre](#) | [Pedro Bação](#) | [João Cerejeira](#) | [Miguel Portela](#)
- 17: The Macroeconomic Determinants of Cross Border Mergers and Acquisitions and Greenfield Investments
[Paula Neto](#) | [Antonio Brandao](#) | [António Cerqueira](#)
- 18: Does the location of manufacturing determine service sectors' location choices? Evidence from Portugal
[Nuno Crespo](#) | [Maria Paula Fontoura](#)
- 19: A hipótese do Investment Development Path: Uma Abordagem por Dados em Painel. Os casos de Portugal e Espanha
[Miguel Fonseca](#) | [António Mendonça](#) | [José Passos](#)
- 20: Outward FDI Effects on the Portuguese Trade Balance, 1996-2007
[Miguel Fonseca](#) | [António Mendonça](#) | [José Passos](#)
- 21: Sectoral and regional impacts of the European Carbon Market in Portugal
[Margarita Robaina Alves](#) | [Miguel Rodriguez](#) | [Catarina Roseta-Palma](#)
- 22: Business Demography Dynamics in Portugal: A Non-Parametric Survival Analysis
[Alcina Nunes](#) | [Elsa Sarmento](#)
- 23: Business Demography Dynamics in Portugal: A Semi-parametric Survival Analysis
[Alcina Nunes](#) | [Elsa Sarmento](#)
- 24: Digging Out the PPP Hypothesis: an Integrated Empirical Coverage
[Miguel de Carvalho](#) | [Paulo Júlio](#)
- 25: Regulação de Mercados por Licenciamento
[Patrícia Cerqueira](#) | [Ricardo Pinheiro Alves](#)
- 26: Which Portuguese Manufacturing Firms Learn by Exporting?
[Armando Silva](#) | [Óscar Afonso](#) | [Ana Paula Africano](#)
- 27: Building Bridges: Heterogeneous Jurisdictions, Endogenous Spillovers, and the Benefits of Decentralization
[Paulo Júlio](#) | [Susana Peralta](#)
- 28: Análise comparativa de sobrevivência empresarial: o caso da região Norte de Portugal
[Elsa Sarmento](#) | [Alcina Nunes](#)
- 29: Business creation in Portugal: Comparison between the World Bank data and Quadros de Pessoal
[Elsa Sarmento](#) | [Alcina Nunes](#)
- 30: The Ease of Doing Business Index as a tool for Investment location decisions
[João Zambujal Oliveira](#) | [Ricardo Pinheiro Alves](#)
- 31: The Politics of Growth: Can Lobbying Raise Growth and Welfare?
[Paulo Júlio](#)
- 32: The choice of transport technology in the presence of exports and FDI
[José Pedro Ponte](#) | [Armando Garcia Pires](#)
- 33: Tax Competition in an Expanding European Union
[Ronald Davies](#) | [Johannes Voget](#)

- 34: The usefulness of State trade missions for the internationalization of firms: an econometric analysis
[Ana Paula Africano](#) | [Aurora Teixeira](#) | [André Caiado](#)
- 35: The role of subsidies for exports: Evidence from Portuguese manufacturing firms
[Armando Silva](#)
- 36: Criação de empresas em Portugal e Espanha: análise comparativa com base nos dados do Banco Mundial
[Elsa Sarmento](#) | [Alcina Nunes](#)
- 37: Economic performance and international trade engagement: the case of Portuguese manufacturing firms
[Armando Silva](#) | [Oscar Afonso](#) | [Ana Paula Africano](#)
- 38: The importance of Intermediaries organizations in international R&D cooperation: an empirical multivariate study across Europe
[Aurora Teixeira](#) | [Margarida Catarino](#)
- 39: Financial constraints, exports and monetary integration - Financial constraints and exports: An analysis of Portuguese firms during the European monetary integration
[Filipe Silva](#) | [Carlos Carreira](#)
- 40: FDI and institutional reform in Portugal
[Paulo Júlio](#) | [Ricardo Pinheiro-Alves](#) | [José Tavares](#)
- 41: Evaluating the forecast quality of GDP components
[Paulo Júlio](#) | [Pedro Esperança](#) | [João C. Fonseca](#)
- 42: Assessing the Endogeneity of OCA conditions in EMU
[Carlos Vieira](#) | [Isabel Vieira](#)
- 43: Labor Adjustment Dynamics: An Application of System GMM
[Pedro Esperança](#)
- 44: Corporate taxes and the location of FDI in Europe using firm-level data
[Tomás Silva](#) | [Sergio Lagoa](#)
- 45: Public Debt Stabilization: Redistributive Delays versus Preemptive Anticipations
[Paulo Júlio](#)
- 46: Organizational Characteristics and Performance of Export Promotion Agencies: Portugal and Ireland compared
[Inês Ferreira](#) | [Aurora Teixeira](#)
- 47: Evaluating the forecast quality of GDP components: An application to G7
[Paulo Júlio](#) | [Pedro Esperança](#)
- 48: The influence of Doing Business' institutional variables in Foreign Direct Investment
[Andreia Olival](#)
- 49: Regional and Sectoral Foreign Direct Investment in Portugal since Joining the EU: A Dynamic Portrait
[Irina Melo](#) | [Alexandra Lopes](#)
- 50: Institutions and Firm Formation: an Empirical Analysis of Portuguese Municipalities
[Simão Arouca](#)
- 51: Youth Unemployment in Southern Europe
[João Leão](#) | [Guida Nogueira](#)
- 52: Financiamento da Economia Portuguesa: um Obstáculo ao Crescimento?
[João Leão](#) | [Ana Martins](#) | [João Gonçalves](#)
- 53: O Acordo de Parceria Transatlântica entre a UE e os EUA constitui uma ameaça ou uma oportunidade para a Economia Portuguesa?
[João Leão](#) | [Guida Nogueira](#)
- 54: Prescription Patterns of Pharmaceuticals
[Ana Gonçalves](#)
- 55: Economic Growth and the High Skilled: the Role of Scale Effects and of Barriers to Entry into the High Tech
[Pedro Gil](#) | [Oscar Afonso](#) | [Paulo Brito](#)
- 56: Finanças Públicas Portuguesas Sustentáveis no Estado Novo (1933-1974)?
[Ricardo Ferraz](#)
- 57: What Determines Firm-level Export Capacity? Evidence from Portuguese firms
[Ana Gouveia](#) | [Ana Luisa Correia](#)
- 58: The effect of developing countries' competition on regional labour markets in Portugal
[Tiago Pereira](#)
- 59: Fiscal Multipliers in the 21st century
[Pedro Brinca](#) | [Hans Holter](#) | [Per Krusell](#) | [Laurence Malafry](#)
- 60: Reallocation of Resources between Tradable and Non-Tradable Sectors in Portugal: Developing a new Identification Strategy for the Tradable Sector
[Ana Fontoura Gouveia](#) | [Filipa Canas](#)
- 61: Is the ECB unconventional monetary policy effective?
[Inês Pereira](#)
- 62: The Determinants of TFP Growth in the Portuguese Manufacturing Sector
[Daniel Gonçalves](#) | [Ana Martins](#)
- 63: Practical contribution for the assessment and monitoring of product market competition in the Portuguese Economy – estimation of price cost margins
[Luis Folque](#)
- 64: The impact of structural reforms of the judicial system: a survey
[Ana Gouveia](#) | [Sílvia Santos](#) | [Corinna Herber](#)
- 65: The short-term impact of structural reforms on productivity growth: beyond direct effects
[Ana Gouveia](#) | [Sílvia Santos](#) | [Inês Gonçalves](#)
- 66: Assessing the Competitiveness of the Portuguese Footwear Sector
[Fábio Batista](#) | [José Matos](#) | [Miguel Matos](#)
- 67: The empirics of agglomeration economies: the link with productivity
[Ana Gouveia](#) | [Sílvia Santos](#) | [Marli Fernandes](#)
- 68: Determinants of the Portuguese GDP stagnation during the 2001-2014 period: an empirical investigation
[Carlos Figueira](#)
- 69: Short-run effects of product markets' deregulation: a more productive, more efficient and more resilient economy?
[Ana Gouveia](#) | [Sílvia Santos](#) | [Gustavo Monteiro](#)

- 70: Portugal: a Paradox in Productivity
[Ricardo Pinheiro Alves](#)
- 71: Infrastructure Investment, Labor Productivity, and International Competitiveness: The Case of Portugal
[Alfredo Pereira](#) | [Rui Pereira](#)
- 72: Boom, Slump, Sudden stops, Recovery, and Policy Options. Portugal and the Euro
[Olivier Blanchard](#) | [Pedro Portugal](#)
- 73: Case Study: DBRS Sovereign Rating of Portugal. Analysis of Rating Methodology and Rating Decisions
[Annika Luisa Hofmann](#) | [Miguel Ferreira](#) | [João Lamprea](#)
- 74: For Whom the Bell Tolls: Road Safety Effects of Tolls on Uncongested SCUT Highways in Portugal
[Alfredo Pereira](#) | [Rui Pereira](#) | [João Pereira dos Santos](#)
- 75: Is All Infrastructure Investment Created Equal? The Case of Portugal
[Alfredo Pereira](#) | [Rui Pereira](#)
- 76: Why Virtuous Supply-Side Effects and Irrelevant Keynesian Effects are not Foregone Conclusions: What we Learn from an Industry-Level Analysis of Infrastructure Investments in Portugal
[Alfredo Pereira](#) | [Rui Pereira](#)
- 77: The Role of Gravity Models in Estimating the Economic Impact of Brexit
[Graham Gudgin](#) | [Ken Coutts](#) | [Neil Gibson](#) | [Jordan Buchanan](#)
- 78: Infrastructure Investment in Portugal and the Traded/Non-Traded Industry Mix
[Alfredo Pereira](#) | [Rui Pereira](#)
- 79: Goods and Factor Market Integration: A Quantitative Assessment of the EU Enlargement
[Lorenzo Caliendo](#) | [Fernando Parro](#) | [Luca David Opromolla](#) | [Alessandro Sforza](#)
- 80: Understanding productivity dynamics: a task taxonomy approach
[Tiago Fonseca](#) | [Francisco Lima](#) | [Sonia C. Pereira](#)
- 81: On the Effects of Infrastructure Investments on Industrial CO2 Emissions in Portugal
[Alfredo Pereira](#) | [Rui Pereira](#)
- 82: Assessing Competition With the Panzar-Rosse Model: An empirical analysis of European Union banking industry
[Suzana Cristina Silva Andrade](#)
- 83: Health Care Investments and Economic Performance in Portugal: An Industry Level Analysis
[Alfredo Pereira](#) | [Rui Pereira](#) | [Pedro G. Rodrigues](#)
- 84: Is deregulation of product and labour markets promoting employment and productivity? A difference-in-differences approach
[Hugo Correia](#) | [Ana Fontoura Gouveia](#)
- 85: Foreign acquisition and internal organization
[Paulo Bastos](#) | [Natália P. Monteiro](#) | [Odd Rune Straume](#)
- 86: Learning, Prices, and Firm Dynamics
[Paulo Bastos](#) | [Daniel A. Dias](#) | [Olga A. Timoshenko](#)
- 87: The Diffusion of Knowledge via Managers' Mobility
[Giordano Mion](#) | [Luca David Opromolla](#) | [Alessandro Sforza](#)
- 88: Empresas Zombie em Portugal - Os sectores não transacionáveis da Construção e dos Serviços
[Gabriel Osório de Barros](#) | [Filipe Bento Caires](#) | [Dora Xarepe Pereira](#)
- 89: Collective bargaining through the magnifying glass: A comparison between the Netherlands and Portugal
[Alexander Hijzen](#) | [Pedro Martins](#) | [Jante Parlevliet](#)
- 90: A Lower VAT Rate on Electricity in Portugal: Towards a Cleaner Environment, Better Economic Performance, and Less Inequality
[Alfredo Pereira](#) | [Rui Manuel Pereira](#)
- 91: Who Seeks Re-Election: Local Fiscal Restraints and Political Selection
[Susana Peralta](#) | [João Pereira dos Santos](#)
- 92: Assessing the Competitiveness of the Metalworking Sector
[João Marinho](#) | [Pedro Carvalho](#)
- 93: The efficiency of Portuguese Technology Transfer Offices and the importance of university characteristics
[Aurora Teixeira](#) | [André Monteiro](#)
- 94: Persistence in innovation and innovative behavior in unstable environments
[Joana Costa](#) | [Anabela Botelho](#) | [Aurora Teixeira](#)
- 95: The effect of entrepreneurial origin on firms' performance - The case of Portuguese academic spinoffs
[Natália Barbosa](#) | [Ana Paula Faria](#)
- 96: Absorptive Capacity and Firms' Generation of Innovation - Revisiting Zahra and George's Model
[Dina Pereira](#) | [João Leitão](#)
- 97: Innovations in digital government as business facilitators: implications for Portugal
[João Martins](#) | [Linda Veiga](#)
- 98: Innovation and the economic downturn: Insights from Portuguese firms
[Hugo Pinto](#) | [Tiago Santos Pereira](#) | [Elvira Uyarra](#)
- 99: European Funds and Firm Dynamics: Estimating Spillovers from Increased Access
[João Pereira dos Santos](#) | [José Tavares](#)
- 100: Corporate Leverage and Investment in Portugal
[Ana Martins](#) | [José Henrique Gonçalves](#) | [João Mário Ferreira Duque](#)
- 101: The effects of official and unofficial information on tax compliance
[Filomena Garcia](#) | [Luca David Opromolla](#) | [Andrea Vezzulli](#) | [Rafael Marques](#)
- 102: Competition effect on innovation and productivity - The Portuguese case
[Anabela Santos](#) | [Michele Cincera](#) | [Paulo Neto](#) | [Maria Manuel Serrano](#)
- 103: Measuring the Welfare of Intermediation in Vertical Markets
[Javier D. Donna](#) | [Pedro Pereira](#) | [Tiago Pires](#) | [Andre Trindade](#)

- 104: Of course Collusion Should be Prosecuted. But Maybe... Or (The case for international antitrust agreements)
Filomena Garcia | Jose Manuel Paz y Minõ | Gustavo Torrens
- 105: Product market competition and gender discrimination
Dudley Cooke | Ana P. Fernandes | Priscila Ferreira
- 106: Integration of Small Technology-Based Firms in Aeronautics
Anabela Reis | Joana Mendonça | Ligia Urbina
- 107: The Effects of Highway Tolls on Private Business Activity – Results from a Natural Experiment
João Pereira dos Santos | David B. Audretsch | Dirk Dohse
- 108: Competition and Firm Productivity: Evidence from Portugal
Pedro Carvalho
- 109: Do Exchange Traded Funds (ETFs) Outperform the Market? Evidence from the Portuguese Stock Index
Carlos Manuel Pinheiro | Hugo Hilário Varela
- 110: Assessing the Competitiveness of the Portuguese Chemical Sector
Ana Rita Marques | Cátia Silva
- 111: A General Equilibrium Theory of Occupational Choice under Optimistic Beliefs about Entrepreneurial Ability
Michele Dell'Era | Luca David Opromolla | Luis Santos-Pinto
- 112: O Mercado Segurador em Portugal: O Papel dos Gestores na Constituição de Provisões
Soraia de Sousa Bornett | Carlos Manuel Pinheiro
- 113: Exploring the implications of different loan-to-value macroprudential policy designs
Rita Basto | Sandra Gomes | Diana Lima
- 114: The Determinants of TFP Growth in the Portuguese Service Sector
Ana Martins | Tiago Domingues | Catarina Branco
- 115: Agglomeration and Industry Spillover Effects in the Aftermath of a Credit Shock
José Jorge | Joana Rocha
- 116: Entrepreneurial Human Capital and Firm Dynamics
Francisco Queiró
- 117: Global Value Chains and Vertical Specialization: The case of Portuguese Textiles and Shoes exports
Tiago Domingues
- 118: Firm heterogeneity and exports in Portugal: Identifying export potential
Frederico Oliveira Torres
- 119: Vantagens Comparativas Reveladas e suas determinantes: Uma Aplicação à Economia Portuguesa
Guida Nogueira | António Portugal Duarte
- 120: A Look at the main channels of Potential Impact of Brexit on the Portuguese Economy
Guida Nogueira | Paulo Inácio
- 121: How internationalization and competitiveness contribute to get public support to innovation? The Portuguese case
Anabela Santos | Michele Cincera | Paulo Neto | Maria Manuel Serrano
- 122: Grande Guerra e Guerra Colonial: Quanto Custaram aos Cofres Portugueses?
Ricardo Ferraz
- 123: Financing a Renewable Energy Feed-in Tariff with a Tax on Carbon Dioxide Emissions: A Dynamic Multi-Sector General Equilibrium Analysis for Portugal
Rui M. Pereira | Alfredo M. Pereira
- 124: Brown Sugar, how come you taste so good? The impact of a soda tax on prices and consumption
Judite Gonçalves | João Pereira dos Santos
- 125: ARFIMA Reference Forecasts for Worldwide CO2 Emissions and the National Dimension of the Policy Efforts to Meet IPCC Targets
José Beirute | Alfredo M. Pereira
- 126: Reference Forecasts for CO2 Emissions from Fossil-Fuel Combustion and Cement Production in Portugal
José M. Belbute | Alfredo M. Pereira
- 127: Regulated Early Closures of Coal-Fired Power Plants and Tougher Energy Taxation on Electricity Production: Synergy or Rivalry?
Alfredo Marvão Pereira | Rui Manuel Pereira
- 128: Picking Our Environmental Battles: Removal of Harmful Subsidies or Carbon Taxation?
Alfredo Marvão Pereira | Rui Marvão Pereira
- 129: Financing Future Feed-in Tariffs from Currently Installed RES-E Generating Capacity
Alfredo Marvão Pereira | Rui Marvão Pereira
- 130: Foreign Direct Investment, Income Inequality and Poverty in Portugal, 1973-2014: What does cointegration analysis tell us?
Aurora Teixeira | Ana Sofia Loureiro
- 131: On the Spillover Effects of CO2 Taxation on the Emissions of other Air Pollutants
Alfredo Marvão Pereira | Rui Marvão Pereira
- 132: On the Macroeconomic and Distributional Effects of the Regulated Closure of Coal-Operated Power Plants
Alfredo Marvão Pereira | Rui Manuel Pereira
- 133: The China Shock and Employment in Portuguese Firms
Lee Branstetter | Brian Kovak | Jacqueline Mauro | Ana Venâncio
- 134: Energy Taxation Reform with an Environmental Focus
Alfredo Marvão Pereira | Rui Manuel Pereira
- 135: ARFIMA Reference Forecasts for Worldwide CO2 Emissions and the Need for Large and Frontloaded Decarbonization Policies
José M. Belbute | Alfredo M. Pereira

- 136: Exporter Firms Behaviour, Evidence From Portuguese Firms Using Microdata
[Luís Pedro Manso Machado](#)
- 137: Collateral Value and Entrepreneurship: Evidence from a Property Tax Reform
[Miguel Ferreira](#) | [João Pereira dos Santos](#) | [Ana Venâncio](#)
- 138: The Financial Channels of Labor Rigidities: Evidence from Portugal
[Edoardo M. Acabbi](#) | [Ettore Panetti](#) | [Alessandro Sforza](#)
- 139: Can a small leak sink a great ship? A comprehensive analysis of the Portuguese household savings
[Tiago Domingues](#) | [Margarida Castro Rego](#)
- 140: Corporate taxes and high-quality entrepreneurship: evidence from a tax reform
[Ana Venâncio](#) | [Victor Barros](#) | [Clara Raposo](#)
- 141: Built Like a House of Cards? - Corporate Indebtedness and Productivity Growth in the Portuguese Construction Sector1
[José Santos](#) | [Nuno Tavares](#) | [Gabriel Osório de Barros](#)
- 142: Effectiveness of Simplex: The Case of Portuguese Social Security
[António Alberto Nifrário de Pinho Tavares](#)
- 143: Digital innovation in higher education: A questionnaire to Portuguese universities and polytechnic institutes
[Paulo Nuno Vicente](#) | [Margarida Lucas](#) | [Vânia Carlos](#)
- 144: Portugal in the Global Innovation Index: A panel data analysis
[Marcelo P. Duarte](#) | [Fernando M. P. O. Carvalho](#)
- 145: Intangible investments and productivity performance
[Michele Cincera](#) | [Julie Delanote](#) | [Pierre Mohnen](#) | [Anabela Santos](#) | [Christoph Weiss](#)
- 146: Digitalization in Two-Sided Platform
[Filomena Garcia](#) | [Muxin Li](#)
- 147: Collusion in Two-Sided Markets
[Yassine Lefouili](#) | [Joana Pinho](#)
- 148: Da confluência entre Big Data e Direito da Concorrência: As concentrações digitais – O caso Facebook/Whatsapp
[Ana Rodrigues Bidarra](#)
- 149: The Determinants of Total Factor Productivity in the Portuguese Quaternary Sector
[Paulo Matos](#) | [Pedro Neves](#)
- 150: Os modelos Input-Output, a estrutura setorial das economias e o impacto da crise da COVID 19
[Pedro N. Ramos](#) | [João Ferreira](#) | [Luís Cruz](#) | [Eduardo Barata](#)
- 151: Public Expenditure and private firm performance: using religious denominations for causal inference
[Henrique Alpalhão](#) | [Marta Lopes](#) | [João Pereira dos Santos](#) | [José Tavares](#)

