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The Influence of Politicians' Sex on Political Budget Cycles: An Empirical Analysis of Spanish Municipalities

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The Influence of Politicians' Sex on Political Budget Cycles: An Empirical Analysis of Spanish Municipalities

Abstract

Employing a sample of Spanish municipalities from the Madrid region for the period 2010–2019, we study the influence of a politician's sex on political budget cycles (PBCs). The Madrid region is subject to a homogenous set of budget rules, which allows consistently categorising budget expenditure items as either 'mandatory' or 'non-mandatory' public services. Differentiating between four sizes of municipalities, the gender influence is studied along two dimensions: mayor's sex and share of women in government. Except for the largest municipalities, we discover significant evidence of PBC-related changes, ranging between 3% and 7% of average municipal budgets, in mandatory spending for both sexes. The impact is roughly twice as large in the long term. On average, male and female mayors tend to increase pre-electoral mandatory spending, even when the government is gender balanced. However, in the (rare) case of female-dominated governments, mayors do not appear to engage in PBC-related activities, and may even decrease mandatory spending, before an election.

JEL Classification: C23, E62, D72, H72, J16

Keywords: Gender, Political budget cycles, Signalling mechanism, Local politicians, Fiscal policy, Spanish municipalities, Madrid region

1. Introduction

The political economy literature suggests that, prior to an election, incumbent politicians seek to influence voter perceptions of their competence and/or preferences by means of fiscal policy. These election-induced fiscal policy cycles are known as the ‘political budget cycle’ (PBC). The earlier literature finds that more competent incumbents signal their competence before elections through higher debt-financed public spending. Over the years, however, researchers have shifted their focus and begun studying a scenario in which voters are not pleased with high-spending governments and thus incumbents who adopt more expansionary fiscal policies can be punished instead of rewarded. In this setting, incumbents, pre-election, signal their competence by adjusting the budget so that specific preferred items receive (new or additional) funding (Drazen and Eslava 2010; Brender and Drazen 2013).

The last decade has witnessed an increasing share of female politicians, a fact reflected in the growing body of research on gender differences and the influence of a politician’s sex on policy choices. A widespread assumption in the literature is that social, health, and education spending is particularly favoured by female politicians. Bagues and Campa (2021), among others, call these types of budget items ‘female’ expenditures. Empirical evidence supporting this conjecture is mixed, though, as only a fraction of the studies report that female political representation matters for different policy choices (Hessami and da Fonseca 2020).

In this context, it seems important to know which budget items voters prefer so as to properly assess whether incumbent politicians are, indeed, manipulating expenditure on these items with the aim of influencing voter perceptions. In the empirical literature, classification of budget items as ‘visible’ or valued by voters appears to be somewhat subjective and context specific. On the one hand, some studies, such as Vergne (2009), Schneider (2010), and Veiga et al. (2017), find that before elections, funds are shifted from investment expenditures towards current expenditures. On the other hand, Drazen and Eslava (2010), Galindo-Silva (2015), Klein and Sakurai (2015), and Repetto (2018) report that opportunistically targeted expenditures are more often associated with infrastructure development projects: roads, schools, water plants, hospitals, and the like. Furthermore, spending areas considered ‘female’ in the literature are not easily categorised in terms of ‘visibility’, for example, a budget item labelled ‘education’ may contain funds for school construction, that is, infrastructure investment, as well as funds for teacher salaries, that is, current expenditure.

We study the influence of gender on PBCs by differentiating between ‘mandatory services’, that is, those budget items that, by law, must be provided by each municipality, and ‘non-mandatory services’, that is, services the municipality is not required to provide. The use of ‘mandatory services’

avoids having to decide, more or less arbitrarily, which budget items are ‘visible’ or more likely to be valued by female politicians and whether such politicians actually have the capacity to alter them. Moreover, we do not use final budget data as a proxy for the provision of public goods, which is standard procedure in the PBC field. Instead, we use the composition of the *initial* budget as a signalling mechanism directed at voters as we believe this to be more in line with the theoretical PBC framework.

Except for Accettura and Profeta (2022), election-related motives behind gender differences in spending have not been researched. The literature on gender differences in public policy does not distinguish between electoral and non-electoral periods (Chattopadhyay and Duflo 2004; Clots-Figueras 2011; Ferreira and Gyourko 2014). However, female politicians’ behaviour may vary between electoral and non-electoral years. In addition, budgets are generally approved by simple majorities and, therefore, PBC-related spending could depend on the relative shares of men and women in government. Moreover, in municipal-level policymaking, male and female mayors interact intensively with the local council. In light of this, it seems plausible that the influence of the mayor’s sex may be conditional on the share of female councillors. Thus, we study the effect of a mayor’s sex conditional on the share of women in the local council.

To study PBC-related activities at the municipal level, we use data from the Madrid region (Comunidad Autónoma de Madrid) for the period 2010–2019. Municipalities in the Madrid region are subject to a homogenous set of budget rules, which allows consistently categorising budget expenditure items as either for ‘mandatory’ or ‘non-mandatory’ public services. Note that 2010–2019 was a period of fiscal austerity, characterised by balanced local budgets and constraints on total expenditures due to Organic Law 2012. Therefore, PBC-related activities could no longer operate through a manipulation of deficits or total spending and, instead, PBC-interested incumbents had to rely on the budget composition to signal their competence and/or preferences. In March 2007, the Equality Act amended Spanish electoral law by introducing gender-balanced candidate lists. The Equality Act has positioned Spain among the group of countries with rising shares of female politicians and it has the additional advantage of allowing us to empirically test the influence of gender on PBCs.

To generate a benchmark, our first regression analysis is an (almost) classic PBC, that is, we condition the results only on the share of women in government. We find significant evidence that in pre-electoral years, mayors opportunistically manipulate expenditures. Next, conditioning on a mayor’s sex, we find that only male mayors engage in PBC-related expenditure hikes.

We then condition the analysis on different types of expenditures—those for either mandatory or non-mandatory public services—as well as on four different sizes of municipalities. We

discover that, except in large municipalities, both male and female mayors engage in PBC-related activities involving mandatory spending. Moreover, gender-balanced governments do not prevent PBC-related spending behaviour. However, for the two smallest sizes of municipalities and the rare case of a female-dominated government, mayors do not appear to engage in PBC-related activities. In the case of non-mandatory expenditures, the combination of a female mayor and a women-dominated government causes a significant, but small, increase in pre-electoral spending. All in all, our analysis suggests that gender-balanced councils, as mandated by the Equality Act, do not appear to prevent pre-electoral budget manipulation. However, we find some evidence that increasing the share of women in government above 60% may reduce the PBC-related behaviour of local politicians. Finally, our long-term analysis suggests that the budgetary impact of PBC-related activities is qualitatively similar to one in the short term but its magnitude is about twice as large.

The remainder of the paper is organised as follows. Section 2 discusses the related literature. Section 3 presents some theoretical considerations. The empirical strategy is formulated in Section 4. Section 5 sets out the results of our analysis, and these are discussed in Section 6. Section 7 concludes.

2. Literature Review

The theoretical literature on PBCs begins with Rogoff and Sibert (1988) and Rogoff (1990), who propose models in which more competent incumbents signal their competence before elections by higher public spending or by altering the budget to showcase more ‘visible’ items. Shi and Svensson (2006) and Drazen and Eslava (2010) develop this perspective further. See García and Hayo (2021) for a more comprehensive discussion of the PBC literature.

The earlier empirical literature (Brender and Drazen 2003, 2005; Persson and Tabellini 2003; Shi and Svensson 2006) relies on country-level panel data and aggregated fiscal expenditure or deficit as the primary PBC indicators. The focus has now shifted towards a scenario in which voters prefer balanced fiscal budgets, although, and at the same time, they may reward high spending on specific, more ‘visible’, items (Vergne 2009; Schneider 2010; Brender and Drazen 2013; Veiga et al. 2017). Furthermore, it has become common to use data from local governments rather than country-level data. Using regional data has a number of advantages. First, it is difficult to control for all sources of cross-country heterogeneity, whereas regions within one country tend to be subject to similar institutional constraints and shocks. Second, using municipal data substantially increases the number of observations for studying PBC-related activities. Third, it is widely believed that citizens are more likely to monitor local government policies and actions than they are to monitor higher-level government action. Moreover, specific groups of voters may be more easily targeted at the local level,

meaning that the distinction between targeted and non-targeted expenditures (or taxes) and their opportunistic manipulation becomes more relevant at this level.

Politicians' perception of 'visible' or targeted items appears to be context specific. On the one hand, some studies, such as Vergne (2009), Schneider (2010), Sakurai and Menezes-Filho (2011), Katsimi and Sarantides (2012), Veiga et al. (2017), and Mandon and Cazals (2019), find that pre-electoral spending shifts from investment towards current expenditures. On the other hand, Kneebone and McKenzie (2001, 757) argue that 'brick and mortar' expenditures are highly visible and beneficial for specific (and potentially large) groups of voters. In line with this, Veiga and Veiga (2007), Drazen and Eslava (2010), Galindo-Silva (2015), Klein and Sakurai (2015), Baskaran et al. (2016), and Repetto (2018) report that opportunistically targeted expenditures are more often associated with infrastructure development projects, for example, roads, schools, water plants, hospitals, and the like.

Bastida et al. (2013), Benito et al. (2013a), Vicente et al. (2013), Cabaleiro-Casal and Buch-Gómez (2018, 2021), and Balaguer-Coll and Ivanova-Toneva (2021) analyse local Spanish PBCs in the context of fiscal austerity. The studies examine the effect of elections on debt, budget stability, and capital expenditure. The researchers tend to find significant hikes in capital spending in (pre-)electoral years, conditional on different political attributes, for instance, majority, government transparency, and party affiliation. Benito et al. (2013b), Guillamón et al. (2013), Benito et al. (2017) and, Cabaleiro-Casal and Buch-Gómez (2020) analyse the effect of PBCs on cultural, police, waste collection, and social municipal expenditures, respectively. Again, conditional on political and socioeconomic characteristics, they all find evidence of electoral manipulation.

The share of female politicians has increased in recent years and this is reflected in the increasing number of empirical studies on the influence of gender differences in policymaking. Due to its political structure and the availability of regional budget data, India has received a lot of attention in the last 20 years. Using a quasi-experimental setup, Chattopadhyay and Duflo (2004), Clots-Figueras (2011, 2012), and Bhalotra and Clots-Figueras (2014) provide evidence of gender differences in budget expenditures, particularly those aimed at health and education, which are traditionally considered of special interest to women. Evidence of gender differences at the local level is found in richer economies, too. On the one hand, Besley and Case (2003), Svaleryd (2009), Funk and Gathmann (2015), Braga and Scervini (2017), Clayton and Zetterberg (2018), and Funk and Philips (2019) show significant differences between male and female politicians when it comes to spending on childcare, health, education, and social assistance. On the other hand, Gagliarducci and Paserman (2012), Ferreira and Gyourko (2014), and Geys and Sørensen (2019) report that increasing the share of female politicians has no impact on the composition of public spending. Accettura and Profeta (2022) find

evidence of both scenarios. When they analyse the full electoral term, they find no spending differences between male and female mayors. However, once the electoral timeline is accounted for, male mayors appear to be more likely to engage in pre-electoral spending on what the authors believe to be highly ‘visible’ items. However, most of these effects are only significant at the 10% level.

Gender differences are also studied using municipal data on Spain. Navarro-Galera et al. (2017), Cabaleiro-Casal and Buch-Gómez (2018), Hernández-Nicolás et al. (2018), Cabaleiro-Casal and Buch-Gómez (2020, 2021), Bagues and Campa (2021), and Ivanova-Toneva (2021) investigate the effect of female mayors and councillors on debt, financial stability, and budget composition. Generally, an increase in the share of female councillors is correlated with less debt and a better financial situation, but results are mixed with respect to total expenditure and budget composition as well as with regard to the specific impact of female mayors. None of the papers on Spain analyses the impact on PBCs of a mayor’s sex and the share of women in government.

3. Theoretical Considerations

Recent PBC literature investigates whether local government incumbents use fiscal policy, in the form of spending composition, to provide specific public goods and signal their competence and/or preferences to the electorate. Empirical studies in this literature look at a number of aspects relevant for PBCs, such as term limits, affiliation of the governor with the national party in power, electoral calendar and political cohesion, characteristics of parties and politicians, degree of fiscal decentralisation, balanced budget rules, voters’ information set, and the role of female mayors and councillors. Despite this wide range of topics, however, we believe the extant literature does not sufficiently consider two potentially important aspects.

First, given that the public visibility of different budget items is the backbone of the theoretical and empirical literature, it is surprising that most of the literature does not distinguish between the different stages of the budget process (García and Hayo 2021). Standard procedure is to use final budget data, in the form of the amount of money that a local government spends on different budget items. This type of data is relatively comprehensive and easy to collect, two characteristics that are useful in applied work.

This standard procedure, however, implicitly assumes that final budget data are a good proxy for the actual provision of public goods. Illustrating why this is potentially problematic, Bradford et al. (1969) decompose the production of public services into two stages. (1) The government uses a vector of primary inputs to produce what the authors call ‘directly produced’ outputs. (2) These directly produced outputs are transformed into observable outcomes. Thus, the government uses monetary

and nonmonetary resources under its control (inputs) to provide directly produced outputs, conditional on its allocative and technical efficiency and a vector of environmental factors. Finally, individual citizens consume the final outcome, which is a function of directly produced output and environmental factors. Hence, citizen welfare depends on the final outcome, and this outcome is not solely determined by public service providers (De Witte and Geys 2011).

The local government efficiency literature acknowledges this complexity and focuses on the first stage, in which basic inputs are transformed into directly produced outputs (Narbón-Perpiñá and De Witte 2018a, 2018b). Given their nonmarket nature, budget expenditures and revenues are the most common proxies for municipal resources employed in local service provision. As emphasised by Narbón-Perpiñá and De Witte (2018b) and Aiello and Bonanno (2019), the transformation of public inputs into final outcomes is not straightforward, as environmental influences can have a large impact on the efficiency of the provided municipal services. In light of these issues, Rosen and Fullerton (1977, 433) conclude that it is problematic to use expenditures on local public benefits as a measure of the quantity and quality of local public services ‘because of the untenable assumption that output can be measured by expenditures on inputs’. Aaberge and Langorgen (2003, 129) agree: ‘The lack of adequate measures for public output is a major problem in the analysis of demand for public services. Using expenditure as a proxy for output, which relies on the assumption on constant prices, is obviously in conflict with reality’. Drazen and Eslava (2010, 41) also allow for the possibility that government policy might not affect individuals’ consumption of the public good.

Second, classification of budget items as ‘visible’ to or valued by voters appears highly context specific. Rogoff (1990, 21) writes that ‘the incumbent leader has an incentive to bias pre-election fiscal policy toward easily observed consumption expenditures, and away from government investment’. Quite the reverse is argued by Drazen and Eslava (2010, 45), who state that ‘in Colombia, opportunistic targeted expenditures are more often associated with infrastructure development projects’. The literature review presented in Section 2 of the current paper demonstrates that the empirical findings are all over the map; some of the studies report a shift in pre-electoral spending towards more current expenditures, whereas other authors provide empirical evidence of opportunistically targeted investment expenditures. There is not even any evidence of clear regional patterns that would allow us to conclude that in Region A, budget item 1 is considered ‘visible’, whereas budget item 2 is more ‘visible’ in Region B.

In our study, we do not use final expenditures to measure public good output, nor do we engage in an arbitrary categorisation of what is, or is not, a ‘visible’ budget item. As to public good provision, we choose to consider the initially proposed budget as a signalling mechanism directed at

voters. According to the literature on local government efficiency in public good provision, actual outcomes are strongly influenced by laws and higher federal levels as well as by past budget decisions (Afonso and Fernandes 2006, 2008; Balaguer-Coll et al. 2007, 2019; Bosch et al. 2012). Although somewhat subject to these influences too, the initial budget is much less constrained, as it can be revised right up until the final budget is adopted. Moreover, the initial municipal budget is published before the actual budget period, which allows incumbents to signal their future policy stance. Hence, in contrast to measuring public good output based on backward-looking final budget data, the initial budget can be understood as a forward-looking type of signal for the following budget period, one that reveals the preferences and/or competence of incumbents through their choice of future fiscal policies. As argued by Drazen (2001, 101–102), fiscal manipulation can have a significant effect on voting without necessarily having an effect on aggregate activity. And finally, typically, it is the initial budget that is reported on and discussed by the media, whereas final budget data are generally available only with considerable delay and are rarely subject to external scrutiny.¹ This could be important, as the media plays a significant role in communicating budget data to the general public (García and Hayo 2021). Thus, municipal-level political debates are typically based on the initial budget, not on the final one.

In most decentralised countries, municipalities are required to provide a minimum of services, the standards for which are determined by higher-level government. Such externally required minimum services have fiscal priority over the rest of the services provided at the municipal level (Balaguer-Coll et al. 2013, 2019; Kalb et al. 2012). Using ‘mandatory services’ as a spending category, we do not have to arbitrarily decide which budget items are ‘visible’ and/or more likely to be valued by female politicians or whether such politicians can actually influence these items. The latter point is emphasised by Geys and Sørensen (2019, 3), who note that there are substantial institutional and budgetary constraints imposed by higher government levels on the local level. Moreover, spending areas that are considered ‘female’ in the literature are not always so easily also categorised as ‘visible’.

In Spain, local governments are responsible for a significant number of tasks. The Spanish Constitution grants municipalities a notable degree of budget autonomy and flexibility, but it is also very specific about what services must be provided. Depending on their population, municipalities must provide different levels of basic services:²

¹ An exception to this statement is big infrastructure projects, for which the final costs of public provision are much higher than the planned ones and that therefore raise questions of poor planning and waste of public funds.

² According to Law 27/2013 (27 December 2013), food and drink control, markets, and slaughterhouses are not part of mandatory minimum services from the 2015 budget onwards. The social work category has been strongly modified. Prior to this law, municipalities were responsible for providing social services. After the reform, the compulsory municipal intervention is no longer, strictly speaking, a service, but a simple identification of needs. While still a mandatory service, the social work category is now of a highly limited nature.

- All municipalities: public lighting, cemeteries, waste collection, public cleaning, drinking water supply, sewer system, access to urban areas, road surfacing, and food and drink control.
- Municipalities with more than 5,000 inhabitants: All of the above, plus public parks, public libraries, and market and waste management.
- Municipalities with more than 20,000 inhabitants: All of the above, plus civil defence, social work, fire safety, sports facilities, and slaughterhouses.
- Municipalities with more than 50,000 inhabitants: All of the above, plus public transport and environment protection.

In our analysis, we categorise municipal expenditure categories as either mandatory or non-mandatory. Thus, in principle, local political decision-makers can increase spending on mandatory budget items above the minimum and/or change non-mandatory spending.

4. Empirical Strategy

4.1 Institutional Context

In 2001, Spain passed the Law of Budgetary Stability to accommodate the European Monetary Union mandate on public finances. Local governments now must comply with the Balanced Budget Rule (BBR), that is, in general, all planned budgets and successive modifications must be balanced. The Ministry of Finance has the right to veto an approved municipal budget if the ministry concludes that the BBR has not been followed properly. Furthermore, local governments may incur deficits only under special circumstances and with the authorisation of the Ministry of Finance. During the economic recession following the global financial crises, that is, from 2009 onwards, local governments (especially those governing large municipalities) suffered a severe worsening of public finances. To maintain budgetary stability at the local level, the Spanish government adopted austerity programmes that included tax increases and public spending reductions. In 2011, public budget stability was anchored in the Spanish Constitution (Article 135). Under this provision, local governments were required to adhere to the BBR and repayment of debt had priority over any other expenditure. A year later, to operationalise the budget stability obligation implemented in the Constitution, the Spanish parliament approved Organic Law 2/2012 ‘Budgetary Stability and Financial Sustainability’. This law further tightens municipalities’ fiscal limits by regulating government expenditures. In 2013, the ‘Local Government Rationalisation and Sustainability Act’ (No. 27/2013) was introduced to ensure that local governments comply with the rules and regulations previously set

out in Article 135 and Organic Law 2/2012. The focus of the Act 27/2013 was to clarify municipal responsibilities and eliminate any overlap in responsibility between local and regional or central governments. The Act's ultimate goal is that local public administrations will act based on the principles of efficiency and financial stability.

Local elections occur simultaneously across the country every four years on the same day. Councillors are elected through a proportional representation system based on closed lists.³ There are as many electoral ballots as there are parties in each municipality, and each ballot includes as many candidates as the number of possible councillors. To ensure that all voters are sufficiently represented, the number of elected councillors is computed according to the d'Hondt law, in combination with a 5% threshold to avoid a situation where local legislation is dominated by many very small parties. The order in which a party's candidates are listed determines who will be elected as councillors. In the opening session of the new council, councillors choose the mayor by simple majority vote. Only candidates placed at the top of the respective party lists are eligible for running as mayor. In principle, council members serve four-year terms and there are no term limits (Organic Law 5/1985, 'General Electoral Regime'). The mayor proposes initiatives and regulations, which are passed, or not, by majority voting in the council. The mayor has full control over the municipality's executive functions and is in charge of explaining and presenting the municipal budget proposal to the council for approval.⁴ The council is responsible for monitoring the municipality's activities and approving the budget and its possible amendments.

In March 2007, the Equality Act mandated gender-balanced candidate lists. According to the Act, at least 40% of the candidates on an electoral list must be female and at least 40% must be male. This quota applies both to the entire party list and to each section of five candidates within the list. For example, in a municipality with 13 councillors, the ballot must contain at least six women and at least six men, plus at least two men and two women within the first five positions and within Positions 6 to 10. Parties whose candidate lists do not fulfil these requirements are not allowed to participate in the elections. The quota was introduced in 2007 in municipalities with more than 5,000 inhabitants; in 2011, it was extended to municipalities with more than 3,000 inhabitants.

4.2 Data

The sample is comprised of municipalities from the Madrid region (Comunidad Autónoma de Madrid) for the period 2010–2019. The Madrid region is an interesting case. First, available information at the local level is generally not homogeneous between regions. Thus, building a comparable database with

³ Municipalities with 250 (or less) inhabitants use an open-list system.

⁴ Sweeting (2009) provides a detailed discussion of the mayor's role in Spain.

municipalities from different regions is fraught with difficulties. Second, Madrid has no supra-municipal authority between municipalities and regional government, which ensures homogeneity in terms of legal requirements with respect to public services provision and grants.⁵ At the same time, the Madrid region is very diverse; it includes a very large municipality, some large ones, and a considerable number of towns and villages. The majority of municipalities in our sample (55%) have less than 5,000 inhabitants; 13% have more than 50,000 inhabitants. Note that, compared to the rest of the country, our sample region underrepresents small municipalities and overrepresents large ones.⁶

The sample period 2010–2019 was determined by data availability. In December 2008, Order EHA/3565—‘Structure of the Budget of Local Entities’—thoroughly modified the structure of local budgets. The changes affected all budgets from 2010 onwards. The revenue side of the budget was virtually unchanged, but the expenditure side was greatly modified, thus making a comparison of most expenditure items before and after 2010 practically impossible. The period 2010–2019 is characterised by balanced local budgets and constraints on total expenditures due to Organic Law 2012. Therefore, PBCs cannot work through deficits or total spending and incumbents interested in creating PBCs must engage in a ‘second best’ strategy, namely, using budget composition to signal their competence and/or preferences (Schneider 2010; García and Hayo 2021).

Administratively, the Madrid region is divided into 179 municipalities. To avoid too many missing observations, we restrict our analysis to municipalities with more than 250 inhabitants, which reduces our database to 156 municipalities. The period 2010–2019 covers three different electoral terms (elections took place in 2011, 2015, and 2019) and yields a panel dataset containing 1,554 observations. We not only consider large municipalities, the focus of most of the extant literature, but include a large number of small municipalities as well. This diversity allows us to study PBCs in both large urban areas as well as in small towns and villages.

Data for planned budgets were extracted from the Ministry of Finance’s CONPREL database, which we merged with data collected from municipality archives.⁷ All nominal variables are expressed

⁵ The Spanish territorial organisation consists of regions (Comunidades Autónomas), provinces (Provincias), and municipalities (Municipios). Each region has one or more provinces, and provinces contain multiple municipalities. Municipalities are required to provide some mandatory services based on their population (see Section 3). The non-mandatory services are provided by either the regional or central government. Article 36 of the local administrative law states that the provincial administration is in charge of coordinating and establishing those municipal mandatory services. According to the territorial administration, it is possible that two similarly sized municipalities that belong to the same region but are located in different provinces could have different standards of mandatory services. Madrid is a region with only one province and, consequently, there cannot be any variability in municipal mandatory services through this channel.

⁶ According to the Spanish Statistical Institute, in 2019, out of 8,131 municipalities, 83% had less than 5,000 inhabitants and 5% more than 50,000 inhabitants.

⁷ <https://serviciostelematicosextr.hacienda.gob.es/SGFAL/CONPREL>

as 2010 real values. Table A1 in the Appendix shows the different public services required to be provided by Spanish municipalities based on the size of their population. Municipalities with fewer than 5,000 inhabitants must provide what we call *Level0* expenditures, whereas *Level1*, *Level2*, and *Level3* are non-mandatory spending items. Municipalities with a population above 5,000 but less than 20,000 are required to offer *Level0* and *Level1* items, whereas items that belong to *Level2* and *Level3* are non-mandatory. Municipalities with a population over 20,000 but less than 50,000 have *Level0*, *Level1*, and *Level2* as mandatory services. All expenditure items in our study are mandatory for municipalities with 50,000 or more inhabitants.

We collect three variables from the revenue side: *Own revenues*, *Current transfers*, and *Capital transfers*. *Own revenues* captures each municipality's degree of fiscal autonomy. *Current transfers* are unconditional transfers from the region based on population, whereas *Capital transfers* can be used only to finance investment projects and are conditional on fulfilling additional requirements. There is evidence that *Current transfers* are biased towards municipalities with large populations, that is, these municipalities receive more than their population share would suggest, whereas smaller municipalities profit over-proportionately from *Capital transfers* (Solé-Ollé and Bosch 2005; Solé-Ollé and Sorribas-Navarro 2008, 2012; Curto-Grau et al. 2018).

Socioeconomic variables were collected from the Statistical Institute of the Community of Madrid.⁸ *Debt*, measured as outstanding debt at the end of the fiscal year, controls for the municipality's level of indebtedness, which is relevant in the Spanish budget process (Cabaleiro-Casal and Buch-Gómez 2018, 2021; Balaguer-Coll and Ivanova-Toneva 2021). *Rent* is a measure of municipal income.⁹ Reflecting the literature on local PBCs, we control for the demand side of public good provision by including *Unemployment rate*, *Population density*, *Share of dependents*, and *Share of immigration*, all of which are measured in per cent.

Political data were retrieved from the Ministry of the Interior's Database of Electoral Results.¹⁰ To create a consistent dataset referring to the governing body rather than the whole council, we combine these variables with specific information on each municipality. We define the governing body as those councillors who are in the governing majority, either via one party's absolute majority or in a coalition. Note that standard procedure in the PBC literature is to collect information on the whole council and then create all political variables based on this information. However, given that the

⁸ <http://gestiona.madrid.org/desvan/Inicio.icm?enlace=almudena>

⁹ This variable is constructed based on information provided by tax authorities (as the main input), plus Information on earnings, wealth, rents (capital and noncapital), social payments, and transfers in each municipality. The weight of each component is adjusted according to different factors, such as number of households, number of declarants, age of population, percentage of rents from nonworking earnings, and a socioeconomic indicator for each municipality.

¹⁰ <http://www.infoelectoral.mir.es/infoelectoral/min/>

budget can be approved by a simple majority in the council, all that matters is the votes of the governing body.¹¹

Left and *Right* measure the government's ideological orientation. When the mayor belongs to the Popular Party or Citizens or one of the two parties is the main member in a coalition, the municipality is defined as right-wing oriented. A mayor who is a member of the Socialist Party or Left United indicates a left-oriented municipality. The rest of the municipalities are governed by local parties that are hard to place on a left–right scale. *Majority* measures government strength; the dummy variable takes on the value 1 when the respective party governs with an absolute majority. *Mayor's tenure*, defined as the number of consecutive terms in office, is used to account for the incumbent's popularity and strength (Aidt et al. 2011; Klein and Sakurai 2015). *Parties in government* captures the degree of government fragmentation.

Our main variables of interest are *Female mayor*, a dummy variable taking the value 1 in case of a female mayor, and the share of women in government. *Male government* is a dummy variable that takes the value 1 when the share of women in government is below 40% and 0 otherwise. *Balanced government* is a dummy variable that takes the value 1 when the share of women in government is between 40–60% and 0 otherwise. *Female government* is a dummy variable that takes the value 1 when the share of women in government is over 60% and 0 otherwise. Since elections take place in the first semester of the year (May), *Pre-election*, our indicator for PBCs, refers to the year before an election takes place. *2015 law* was introduced to clarify municipal responsibilities and eliminate overlaps in responsibility between local and regional or central governments; the variable accounts for the stricter regulation in local spending at the municipal level from 2015 onwards.

4.3 Method

Our dependent variables are items from municipal budgets that have shown a considerable degree of persistence. Thus, to avoid misspecifying the models, it is advisable to consider a lagged dependent variable. In addition, we include a set of control variables and the time-based indicators for elections. The basic dynamic regression specification is:

$$y_{i,t} = \delta y_{i,t-1} + \sum_{j=0}^1 \varphi' X_{i,t-j} + \beta_E E_{i,t} + \sum_{j=0}^1 \theta' D_{i,t-j} + \mu_i + \varepsilon_{i,t} \quad (1)$$

where i is an index for municipalities, t is the year index, $y_{i,t}$ is the budget category of interest, $X_{i,t-j}$ is a vector of controls, $E_{i,t}$ is the pre-election dummy variable, $D_{i,t-j}$ is a set of dummies, μ_i is a fixed

¹¹ When a party does not have an absolute majority and a coalition is not reached, the whole council is considered the governing body.

effect at the municipal level, and $\varepsilon_{i,t}$ is the idiosyncratic error term. The j index represents the fact that we allow for some dynamics, not only with respect to the lagged dependent variable, but also in regard to the independent variables.

For a small number of time-series observations T , the inclusion of a lagged dependent variable causes the panel data fixed effect (FE) estimator not only to become biased, but also to be inconsistent, regardless of the number of cross-sections (Nickell 1981; Kiviet 1995). In our analysis, T equals 10 and, hence, the resulting bias could be non-negligible.

Instrumental variable and generalised method of moments (GMM) estimators are extensively applied in estimating panel data models. However, GMM estimators tend to suffer from weak instruments, especially when the dependent variable is highly persistent (Bun and Windmeijer 2010), thus undermining their consistency property. Furthermore, the risk of obtaining inefficient estimates is very high due to the fact that it is very difficult to detect the validity of the instruments in the GMM context. Roodman (2009) calls this ‘the problem of instrument proliferation’. In practice, this aspect of the estimator often makes GMM estimates highly sensitive to the specific instrument set.

Motivated by these disadvantages, Kiviet (1995) developed a bias-corrected FE estimator based on a higher-order expansion of the bias term. Kiviet (1995) and Judson and Owen (1999) demonstrate that for finite samples, the bias-corrected estimator is an attractive alternative to GMM estimators. A drawback of the ‘Kiviet correction’ is that it is based on unknown parameters that have to be estimated by a consistent initial estimator. Accordingly, the asymptotic distribution of this estimator is unknown.

In light of this, Breitung et al. (2022) propose a bias-corrected estimator obtained as a method of moments estimator. This estimator does not require specific assumptions about the initial values of the dynamic process, nor must the researcher choose a preliminary estimator. This bias-corrected estimator is easier to implement than likelihood-based estimators and has an advantage over more ‘classical’ bias-corrected methods in that heteroscedasticity and cross-sectional dependence are accounted for when computing cluster-robust standard errors. Small-sample Monte Carlo simulations suggest that, relative to FE and GMM, the ‘Breitung et al.’ estimator performs well with respect to efficiency and correctly sized tests. When T is around 10, the estimator appears to outperform GMM estimators and perform as well as the ‘Kiviet’ estimator, at least as long as the persistence of the autoregressive component is moderate (around 0.4). In the presence of heteroscedasticity and cross-sectional dependence, and when there is moderate persistence, the ‘Breitung et al.’ estimator appears robust.

In our sample, the time dimension (T) equals 10 and the degree of persistence is moderate. Moreover, our data seem to suffer from cross-sectional dependence and heteroscedasticity, which can be accounted for by using cluster-robust standard errors. Thus, given these conditions, we believe that the ‘Breitung et al.’ estimator is the best choice.

In terms of model specification, using the Breitung et al. estimator allows including a large number of control variables and accounting for a fairly dynamic adjustment process in the independent variables, too. In our study, we recognise the possibility of inertia in the adjustment of expenditures to the revenue side of the budget by including current and lagged values of *Own revenues*, *Current transfers*, and *Capital transfers*. *Debt*, *Rent*, and *Unemployment* are used only in lagged form, since current values are published only well after the budget has been approved. *Population density*, *Share of dependents*, and *Share of immigration* are incorporated in current and lagged form because these measures are computed on 1 January each year and could be considered in the budget process. All political variables are included in lagged form, as the planned budget in year t was proposed by the governing body in $t - 1$.

Note that dynamic models imply a potential difference between the effects of explanatory variables in the short term and the long term. Our focus is on the short-term effects, as we follow the extant literature and identify PBCs using changes in specific budget items one year before the election. The long-term effect describes the budgetary implications of PBC-related activities beyond the actual election event, which we believe to be of interest too. Hence, we briefly summarise the long-run impact in our discussion of the results and set out the actual estimates in the Appendix.

There could be simultaneity between spending decisions and women’s representation (Svaleryd 2009). To avoid this potential endogeneity problem, some studies take advantage of exogenous changes in women’s representation that are not correlated with budget decisions (Chattopadhyay and Duflo 2004; Clots-Figueras 2011, 2012; Bhalotra and Clots-Figueras 2014; Ferreira and Gyourko 2014; Geys and Sorensen 2019). In Spain, the Equality Act could be used for identification. Bagues and Campa (2021) make use of that exogenous change by employing a regression discontinuity design around the 3,000-inhabitant population threshold. This approach is likely reliable for values close to the threshold, but it is unclear how well it captures the behaviour of municipalities with populations far from the threshold. Since we study expenditure patterns among municipalities of different size, the regression discontinuity approach is not helpful, nor do we have enough observations before the reform to conduct a diff-in-diff estimation, as in Geys and Sorensen (2019).

However, due to institutional restrictions, it is not clear how serious the endogeneity problem is in practice, as voters in Spanish local elections cannot directly show their preferences for male or female politicians by voting for single candidates. The closed lists of a proportional representation system do not give voters any power to affect the order of candidates on party lists. Casas-Arce and Saiz (2015) present evidence for Spanish municipalities that prior to the quota system, party leaders were not trying to maximise electoral results by including too few women in the lists. According to Cordero et al. (2016), at least in the case of the main political parties, the list order is in the hands of party elites and responds more to competing interests within each party rather than being a strategic scheme to gain electoral support. In addition, the main left-wing parties have adopted a ‘championing’ position with regard to women’s political representation, with the aim of distinguishing themselves from the other parties. However, this has created a contagion effect across the Spanish party system at the local level, making the lists more homogenous in terms of gender composition (Kenny and Verge 2013; Simon and Verge 2017; Verge 2020). In light of these considerations, we consider the proportion of female councillors as an exogenous variable in our econometric analyses. An important caveat is that the same line of argument cannot be applied to the mayor, the most visible figure representing the party, and, therefore, the voters’ election of a female mayor might well be correlated with some desired spending decisions.

5. Results

To understand how PBC-related expenditure is influenced by gender differences, Table A2 sets out the results for Equation (1) with a triple interaction between *Pre-election*, *Female mayor*, and *Balanced government*, as well as including *Female government* (base category: *Male government*). We perform separate regressions for municipalities classified according to their population size. Given that our sample size ranges from 119 to 672 observations, we believe a 5% significance level for conducting statistical tests is reasonable.

First, we focus on mandatory spending as the dependent variable. As seen in Table A2 of the Appendix, Columns 1, 3, 5, and 7, the lagged dependent variable is always significant, but with a low to moderate magnitude. *Own revenues* and *Current transfers* are the primary sources of income for the municipality and they generally show a significantly positive effect. It is important to allow for some dynamics in the influence of the revenue variables, as they are generally characterised by overshooting in the current period, which is typically corrected one period later.¹² The influence of

¹² At the 5% level, we cannot reject the null hypothesis that the sum of the coefficients is equal to zero. The only exception is the test for current transfers at *Level3*, which cannot be rejected at the 10% level. In the case of *Level2* municipalities, we find undershooting in the current period.

socioeconomic characteristics is conditional on the size of municipalities, which is in line with the notion that smaller municipalities are subject to extensive budgetary and political constraints, whereas larger municipalities have more budgetary leeway in regard to specific socioeconomic structures. Turning to political variables, neither small nor large municipalities show evidence of politically motivated mandatory spending.

Budget variables are less relevant in non-mandatory spending (Table A2, Columns 2, 4, and 6) than they are for mandatory spending.¹³ Lagged dependent variable are rarely significant, an exception is *Level1* municipalities, which suggests that non-mandatory expenditures are characterised by less persistence and that local governments can use these budgetary items more flexibly. The significantly positive results for *Capital transfers* are in line with evidence showing that small municipalities receive an over-proportional share so as to be able to finance investment projects in non-mandatory budget categories, whereas larger municipalities appear to use capital transfers for mandatory budget categories (Solé-Ollé and Bosch 2005; Solé-Ollé and Sorribas-Navarro 2008, 2012; Curto-Grau et al. 2018). Regarding the political level, *Mayor's tenure* is relevant only for *Level1* municipalities.

Interpreting point estimates and their significance is problematic in the case of interacted variables (Braumoeller 2004; Brambor et al. 2006). Hence, we compute conditional average marginal effects (AMEs); the results are set out in Tables 1 and 2. According to the thresholds defined, reflected in our three dummy variables (below 40%, between 40–60%, and more than 60% share of women in government), the government's gender distribution is the following:

- For *Level0* municipalities: 55% have *Male government*, 40% *Balanced government*, and 5% *Female government*.
- For *Level1* municipalities: 35% have *Male government*, 61% *Balanced government*, and 4% *Female government*.
- For *Level2* municipalities: 29% have *Male government*, 69% *Balanced government*, and 2% *Female government*.
- For *Level3* municipalities: 21% have *Male government*, 79% *Balanced government*, and no *Female government*.

Hence, the government becomes more gender balanced with increasing municipality size. However, there is still a much higher share of male-dominated governments.

Table 1 shows AMEs in pre-electoral years for the three different shares of women in government. Focusing on mandatory spending in Columns 1, 2, and 3, we find a statistically significant

¹³ For *Level3* municipalities, all the budget items we consider in our analysis are mandatory.

increase in mandatory spending the year before an election takes place, except for in *Level3* municipalities. We discover a PBC-related increase in spending of €47 per capita for *Level0* municipalities, but only when we do not condition on mayor's sex and when the government is gender balanced (Column 1). The average spending of *Level0* municipalities is €1,361 per capita and, thus, the PBC-related average effect across male and female mayors is equal to almost 4% of total expenditures. For *Level1* municipalities and gender-balanced governments, the PBC-related increase in average spending is €21 per capita, which, given that the average per capita spending in *Level1* municipalities is €952, equals more than 2% of total spending.

Table 1: Pre-electoral year average marginal effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Mandatory			Non-Mandatory		
	All	Male mayor	Female mayor	All	Male mayor	Female mayor
<u><i>Level0 municipalities</i></u>						
Less than 40% women	28.06 (18.79)	35.52 (21.86)	2.32 (26.64)	15.79 (9.77)	7.21 (9.98)	45.41 (28.78)
Between 40–60% women	46.81*** (17.22)	42.94** (17.82)	60.17 (41.66)	41.76* (22.58)	46.38* (26.11)	25.83 (16.22)
More than 60% women	9.93 (19.03)	-4.54 (21.49)	59.85 (50.90)	-29.61 (21.34)	-15.23 (17.53)	-79.21 (72.98)
<u><i>Level1 municipalities</i></u>						
Less than 40% women	-7.74 (8.17)	-8.75 (11.55)	-5.34 (11.15)	1.78 (3.96)	3.34 (4.93)	-1.94 (7.41)
Between 40–60% women	20.88*** (7.43)	18.91** (8.95)	25.59*** (9.68)	-5.14 (5.17)	-10.79 (6.64)	8.38 (5.70)
More than 60% women	-12.17** (5.98)	3.78 (7.99)	-50.25*** (4.33)	4.80 (3.53)	3.78 (4.79)	7.23*** (2.53)
<u><i>Level2 municipalities</i></u>						
Less than 40% women	57.53** (24.20)	68.10** (34.28)	28.81 (18.93)	0.50 (8.69)	-2.80 (7.45)	9.49 (12.86)
Between 40–60% women	34.77*** (8.79)	37.35*** (7.35)	27.74 (19.85)	2.18 (6.80)	-11.03 (9.16)	38.11 (39.98)
More than 60% women	NA	NA	NA	NA	NA	NA
<u><i>Level3 municipalities</i></u>				<u><i>Classic PBC</i></u>		
Less than 40% women	NA	-5.62 (9.79)	NA	33.13*** (11.38)	32.97*** (12.33)	33.63 (24.23)
Between 40–60% women	9.85 (7.14)	12.93 (8.73)	-4.97 (7.13)	27.91* (14.44)	29.47* (17.25)	23.06 (20.18)
More than 60% women	NA	NA	NA	-4.50 (21.08)	1.76 (13.18)	-23.97 (79.25)

Notes: Cluster-robust standard errors are used. *, **, and *** indicate significance at a 10%, 5%, and 1% level, respectively.

NA indicates that there are not enough observations to estimate the effect.

For a female-dominated government, average pre-electoral spending decreases by €12 per capita (more than 1% of total spending). For *Level2* municipalities, the effect is always positive; *Male government* increases average spending by €58 per capita, whereas *Balanced government* leads to a smaller increase of €35 per capita. The average spending of *Level2* municipalities is €1,052 per capita; a magnitude of almost 6% and more than 3% of total spending, respectively.

Turning to AMEs conditional on mayor's sex (Table 1, Columns 2 and 3), we see that the significant difference between pre-electoral years and non-pre-electoral ones noted above is driven by male mayors in *Level0* and *Level2* municipalities. In *Level0* municipalities with *Balanced governments*, male mayors increase pre-electoral spending by €43 per person (more than 3% of total spending). In *Level2* municipalities, male mayors increase spending by €68 per capita when there is a *Male government* and €37 per capita in the presence of a *Balanced government*, which amount to a magnitude ranging from almost 7% to almost 4% of total spending, respectively.

For *Level1* municipalities with *Balanced government*, both male and female mayors increase mandatory spending. The increase is €19 and €26 per capita (2% and almost 3% of total spending) for male and female mayors, respectively. However, a combination of *Female mayor* with *Female government* reduces pre-electoral spending by €50 per capita, which is more than 5% of the total budget.

For non-mandatory spending (Table 1, Columns 4, 5, and 6), we find fewer significant effects than for mandatory spending. For *Level1* municipalities under *Female government* and having a *Female mayor*, we see a significant increase of average spending. However, the hike is only €7 per capita, which is less than 1% of total spending.

There seem to be gender differences in mayors' budgetary strategies before elections. Generally, male mayors tend to spend significantly more in pre-electoral years than during the rest of their term, whereas female mayors do not appear to use PBC-related spending to the same extent. PBC-related activities seem to be particularly pronounced when the government is gender balanced. Thus, the occurrence of a higher or lower share of *Women in government* seems to be conducive for reducing PBC-related activities.

Table 2 presents AMEs computed as differences in mayor's sex and conditional on the three different shares of women in government. Generally, most of the gender differences identified above are not significant when considering the respective estimation uncertainty. Focusing on mandatory spending, Columns 1 and 2, we see differences between female and male mayors for *Level1* municipalities. Conditional on *Female government*, female mayors spend significantly less than do male mayors in pre-electoral years. The average decrease is €41 per capita, more than 4% of total spending.

Turning to non-mandatory spending, Table 2, Columns 3 and 4, shows significant results for *Level1* municipalities. Given *Male government*, female mayors spend less than do male ones. Female mayors reduce spending by €17 and €22 per capita, roughly 2% of total spending, in non-pre-election and pre-election years, respectively.

Table 2: Female mayor average marginal effects

	(1)	(2)	(3)	(4)
	Mandatory		Non-mandatory	
	Non- pre- election	Pre-election	Non- pre- election	Pre-election
<u><i>Level0 municipalities</i></u>				
Less than 40% women	11.38 (27.16)	-21.82 (34.99)	29.21 (25.87)	67.41* (35.16)
Between 40–60% women	5.86 (21.44)	23.09 (41.91)	24.94 (20.78)	4.39 (21.75)
More than 60% women	-45.07 (40.51)	19.32 (57.16)	5.73 (52.07)	-58.25 (54.64)
<u><i>Level1 municipalities</i></u>				
Less than 40% women	-15.42 (17.47)	-12.01 (12.11)	-17.11** (6.70)	-22.39*** (6.21)
Between 40–60% women	-18.38 (12.52)	-11.70 (14.59)	-13.61* (7.05)	5.57 (10.71)
More than 60% women	12.95 (20.72)	-41.08** (18.92)	-11.07 (7.46)	-7.61 (8.28)
<u><i>Level2 municipalities</i></u>				
Less than 40% women	-43.29 (29.84)	-82.58* (49.62)	12.47 (20.59)	24.76 (15.79)
Between 40–60% women	-4.43 (28.55)	-14.05 (23.15)	13.46 (9.91)	62.60 (54.39)
More than 60% women	NA	NA	NA	NA
<u><i>Level3 municipalities</i></u>			<u><i>Classic PBC</i></u>	
Less than 40% women	NA	NA	22.06 (18.67)	22.58 (30.36)
Between 40–60% women	15.96 (11.31)	-1.94 (9.84)	-1.86 (12.09)	-6.84 (24.62)
More than 60% women	NA	NA	-4.69 (45.36)	-24.70 (71.08)

Notes: Cluster-robust standard errors are used. *, **, and *** indicate significance at a 10%, 5%, and 1% level, respectively. NA indicates that there are not enough observations to estimate the effect.

Results for a ‘classic’ PBC approach are set out in the right bottom corners of Tables 1 and 2. In this case, we do not distinguish between mandatory and non-mandatory spending, and we do not

split the sample based on municipality size. In Table 1, this approach suggests that pre-electoral manipulation is driven solely by male mayors and only when the council is male dominated. This is in line with the standard view in the literature, namely, that female politicians are associated with higher compliance with legal rules. However, Table 2 shows, first, that the differences between male and female mayors are no longer significant when testing the effects against each other, rather than against zero. Second, contrasting these conclusions with those set out in the other parts of the table, we conclude that classifying municipalities according to their size and categorising budget items as mandatory or not unveils PBC-related influences of female politicians that would otherwise remain hidden.

6. Discussion of Results

Some studies of Spanish municipalities show that female mayors tend to be more compliant with legal restrictions on debt and financial sustainability (Cabaleiro-Casal and Buch-Gómez 2018; Hernández-Nicolás et al. 2018), especially in the presence of a gender-balanced council as mandated by the Equality Act (Navarro-Galera et al. 2017). Cabaleiro-Casal and Buch-Gómez (2021) report quite the reverse, however: the effect of female mayors is very limited and a greater share of female councillors worsens fiscal performance. Note that previous studies do not analyse possible nonlinearities in the influence of gender and only consider situations where the total share of women in the council is below the Equality Act's required 40% value. When conditioning on the mayor's sex, our analysis suggests that increasing the proportion of women among the councillors supporting the government does not prevent PBC-related activities. Both male and female mayors tend to increase pre-electoral spending, but there is evidence, albeit insignificant, that the former engage in more PBC-related activities.

Balaguer-Coll and Ivanova-Toneva (2021) condition the effect of female councillors on the mayor's sex and conclude that the combination of a female mayor with a council composition in line with the Equality Act results in greater budget stability.¹⁴ Their results also show that in pre-electoral years, female mayors are less likely to engage in PBC-related activities. In general, our results do not corroborate their findings: that is, we find, conditional on female mayors, that government composition is generally irrelevant for PBC spending. Only for *Level 1* municipalities is there an effect of government composition on PBC, but it goes in the opposite direction: a balanced government

¹⁴ The authors measure budget stability with three different dummies used as dependent variables: compliance with payment period, compliance with debt limits, and compliance with no budget deficit.

facilitates PBC spending. However, in a female-dominated *Level1* government, pre-electoral spending is even reduced.

In addition, Table 2 shows that under balanced government, we cannot distinguish between the spending of female and male mayors in pre-electoral years. Furthermore, the upper threshold of the Equality Act was not considered in Balaguer-Coll and Ivanova-Toneva's (2021) analysis and this omission could be why our results differ from theirs. As discussed above, in the (rare) case of a female-dominated government, female mayors behave heterogeneously by: (i) not taking part in PBC-related activities, which seems to be the most frequent case, (ii) increasing pre-electoral non-mandatory spending, or (iii) even decreasing mandatory spending before elections.

In a sample of large Spanish municipalities, all of which receive a lot of media coverage in Spain, Cabaleiro-Casal and Buch-Gómez (2020) report a limited gender impact on social spending. In line with their results, we provide evidence that gender-based political budget cycles do not occur in the large *Level3* municipalities either.

Bagues and Campa (2021) study whether the Equality Act had an effect on the proportion of female councillors and female mayors. They employ a regression discontinuity design around the 3,000 and 5,000 population threshold to check whether budget composition changes around the threshold. They do not observe significant variations in the size and composition of public finances. Concentrating on *Level0* municipalities, we also find no gender differences in mandatory spending. Male mayors appear to increase expenditures for electoral purposes, though.

Accettura and Profeta (2022) report that male mayors in Italy are more likely to engage in pre-electoral spending on highly 'visible' items. Our results employing mandatory spending are in partial agreement with their findings: conditioning on mayor's sex, male mayors tend to engage in PBC-related activities, particularly in gender-balanced governments. However, in Spanish *Level1* municipalities, female mayors also seem to use pre-electoral spending strategically.

As noted above, dynamic models allow differentiating between the short-term and long-term impact of explanatory variables. Given the nature of the PBC identification strategy, the effects presented and discussed throughout the paper refer to the short term. However, we believe it is important to highlight the fact that PBC-related activities have consequences that differ over the long term and we set out the corresponding estimation results in Tables A3 and A4 of the Appendix. In general, the qualitative effects of long-term AMEs in pre-electoral years are similar to the short-term AMEs reported in Table 2. Some AMEs become more significant over the long run, such as the ones for non-mandatory spending in *Level0* municipalities, and others become less significant, such as the

ones for mandatory spending in *level 1* municipalities. The significance of long-term AMEs for differences in mayor's sex set out in Table A4 is almost identical to the one reported in Table 2 for the short term. However, we also discover notable increases in the magnitude of the respective AMEs, which, on average, are about twice as large in the long term. Thus, short-term oriented PBC-related activities appear to cause substantial consequences for municipal budgets in the long term.

We perform a battery of robustness tests. Regarding the estimation method and possible outliers, results remain unchanged when using the 'Kiviet' estimator and excluding Madrid proper as a municipality.¹⁵ When controlling for the influence of the Equality Act in continuous form instead of using dummies, results remain generally unchanged, too. Above, we argue that all that matters is the votes of the governing body because budgets are approved by simple majority in the council, which is why we focus on the gender composition of the government supporters in the council. However, the extant literature bases its results on total council composition and, hence, we use *Share of women in the total council* as a robustness test. Theoretically, the competing hypotheses are whether female councillors matter for PBC-related activities because of their influence on (1) general political debates in the council or (2) government budget decisions. We discover that *Share of women in the total council* shows few significant effects, most of which are generally in line with our results based on female government councillors. Hence, we conclude that what matters for PBC-related activities is the share of women in government, that is, Hypothesis (2), and not the total share of women in the council.

7. Conclusion

Using a dataset on Spanish municipalities, we investigate gender differences in PBC-related activities. However, in contrast to the extant literature, we do not study the influence of mayor gender, or female representation on municipal councils, in isolation. Instead, we take a look at different gender combinations of both mayor and council. Indeed, we depart from the literature in at least three important aspects: (1) by using the composition of the initial budget as a signalling mechanism directed at voters, instead of using the final budget composition as a proxy for output, (2) by avoiding the arbitrary categorisation of 'visible' or preferred budget items and instead classifying expenditures according to a clear budgetary rule, and (3) by concentrating on the share of female government councillors.

To study PBC-related spending at the municipal level, we use data from the Madrid region (Comunidad Autónoma de Madrid) for the period 2010–2019. The Madrid region is subject to a

¹⁵ Results are available on request.

homogenous set of budget rules, which allows consistently categorising budget expenditure items as either ‘mandatory’ or ‘non-mandatory’ public services. Furthermore, 2010–2019 was a period characterised by balanced local budgets and constraints on total expenditures due to Organic Law 2012. Therefore, during that period, PBCs could no longer be effected via manipulation of deficits or total spending and, instead, incumbents interested in manipulating the budget to their advantage had to rely on the budget composition to signal their competence and/or preferences. Additionally, in March 2007, the Equality Act introduced gender-balanced candidate lists to Spanish electoral law. The Equality Act has positioned Spain among the group of countries with rising shares of female politicians and has the added advantage of allowing us to empirically test the influence of gender differences on policymaking and PBCs.

Without conditioning on mayor’s sex, we find evidence of an opportunistic manipulation of expenditures in pre-electoral years, especially in the case of gender-balanced governments. PBCs appear to be more present and greater in magnitude for mandatory than for non-mandatory spending categories. Thus, a council that is gender-balanced in compliance with the Equality Act does not prevent the occurrence of pre-electoral manipulation, at least with respect to mandatory spending.

When conditioning on mayor’s sex, however, a different picture emerges. In *Level0*, *Level1*, and *Level2* municipalities, male mayors increase pre-electoral mandatory spending by more than 3%, 2%, and almost 7% of total spending, respectively. Female mayors of *Level1* municipalities increase both mandatory and non-mandatory spending, with a maximum increase of almost 3% of total expenditures. A female mayor combined with a female government will increase non-mandatory spending before elections, but this PBC-related effect is accompanied by a corresponding decrease in mandatory spending. *Level3* municipalities exhibit no significant evidence of PBC-related activities. Thus, what we have found is that, generally, creating (or mandating the creation of) gender-balanced governing councils does not prevent PCBs.

Our analysis reveals very few significant differences between the PCB-related behaviour of male and female mayors in pre-electoral years, namely, only for *Level1* municipalities and when the government is not gender balanced. We also find that the influence of women councillors who support the current government is more important than the total share of female councillors, the indicator used in the extant literature. Our evidence supports the conclusion that gender-balanced councils do not appear to prevent pre-electoral budget manipulation, but they do seem to rather homogenise such behaviour across sexes, at least in pre-electoral years. Finally, we find some evidence that increasing the share of women in government above 60% may reduce the PBC-related behaviour of

local politicians. However, and in contrast to a widely held opinion, having more women in government does not appear to change the electorally motivated spending of (male) mayors.

Finally, moving from the short-term to the long-term perspective, our analysis of PBC-related activities shows that, on average, the significance of the estimated effects remains rather similar. However, compared to the short term, their quantitative budgetary impact is roughly twice as large in the long term. Hence, seen from an economic policy perspective, these estimates suggest that any distortionary effect arising from the use of PBCs can be roughly doubled when considering longer periods of time.

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Appendix

Table A1: Descriptive statistics

<i>Variable</i>	<i>Description</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>Std. Dev.</i>
<i>Level0 expenditures</i>	Spending on: public lighting, cemeteries, waste collection, public cleaning, drinking water supply, sewer system, access to urban areas, road surfacing, and food and drink control. Real euros per capita.	0	1271.48	164.25	134.22
<i>Level1 expenditures</i>	Spending on: public parks, public libraries, and market and waste management. Real euros per capita.	0	443.29	60.94	54.77
<i>Level2 expenditures</i>	Spending on: civil defence, social work, fire safety, sports facilities, and slaughterhouse. Real euros per capita.	0	4126.82	117.26	354.87
<i>Level3 expenditures</i>	Spending on: public transport and environment protection. Real euros per capita.	0	393.91	9.09	23.03
<i>Own revenues</i>	Revenues from direct taxes, indirect taxes, and fees. Real euros per capita.	234.48	2977.06	656.45	236.65
<i>Current transfers</i>	Current transfers from higher-level government (regional and central). Real euros per capita.	44.25	4996.12	377.7	420.6
<i>Capital transfers</i>	Capital transfers from higher-level government (regional and central). Real euros per capita.	-1.73	2682.69	81.99	202.36
<i>Debt</i>	Municipal debt. Real euros per capita.	0	7217.44	443.14	696.83
<i>Rent</i>	Municipal income. Real euros per capita.	9670.91	37788.56	15097.55	3651.97
<i>Unemployment rate</i>	Percentage of registered unemployed in relation to labour force.	1.64	85.51	34.4	16.56
<i>Population density</i>	Inhabitants per km ² .	7.81	7635.99	577.76	1175.27
<i>Share of dependents</i>	Share of the population below 15 and over 65 in relation to total population (in %).	21.87	44.36	31.77	3.17
<i>Share of immigration</i>	Share of non-Spanish inhabitants in relation to total population (in %).	2.96	40.42	13.72	5.39
<i>Female mayor</i>	Dummy variable taking value 1 when mayor is female (0 otherwise).	0	1	0.24	0.43
<i>Mayor's tenure</i>	Number of consecutive terms the mayor has been in office.	0	6	1.02	1.39
<i>Left</i>	Dummy variable taking value 1 when the governing body has left-wing ideology (0 otherwise).	0	1	0.22	0.42
<i>Right</i>	Dummy variable taking value 1 when the governing body has right-wing ideology (0 otherwise).	0	1	0.65	0.48
<i>Majority</i>	Dummy variable taking value 1 when only one party governs with absolute majority (0 otherwise).	0	1	0.59	0.49
<i>Parties in government</i>	Number of parties in the government.	1	7	1.91	1.36
<i>Share of women in government</i>	<i>Male government</i> : takes the value 1 when the share of women in government is below 40%.	0	1	0.42	0.49
	<i>Balanced government</i> : takes the value 1 when the share of women in government is between 40–60%.	0	1	0.54	0.50
	<i>Female government</i> : takes the value 1 when the share of women in government is over 60%.	0	1	0.04	0.20
<i>Share of women in the total council</i>	<i>Male council</i> : takes the value 1 when the share of women in the council is below 40%.	0	1	0.48	0.49
	<i>Balanced council</i> : takes the value 1 when the share of women in the council is between 40–60%.	0	1	0.49	0.50
	<i>Female council</i> : takes the value 1 when the share of women in the council is over 60%.	0	1	0.03	0.17

<i>Pre-election</i>	Dummy variable taking the value 1 in the year preceding a local election (0 otherwise).	0	1	0.30	0.46
<i>2015 law</i>	Dummy variable taking the value 1 from 2015 onwards (0 otherwise).	0	1	0.50	0.50

Table A2: Explaining spending at each municipality level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Level 0 municipalities		Level 1 municipalities		Level 2 municipalities		Level 3 municipalities
	Mandatory	Non-mandatory	Mandatory	Non-mandatory	Mandatory	Non-mandatory	Mandatory
Lag dependent	0.39*** (0.10)	0.14 (0.18)	0.60*** (0.11)	0.44*** (0.09)	0.40*** (0.07)	0.18 (0.16)	0.65*** (0.08)
Own revenues	-0.02 (0.07)	0.01 (0.05)	0.20* (0.12)	-0.02 (0.02)	0.34*** (0.09)	0.07 (0.05)	0.36*** (0.10)
Lag own revenues	0.04 (0.03)	-0.04 (0.04)	-0.21** (0.10)	-0.02 (0.02)	-0.09 (0.07)	-0.07 (0.05)	-0.33*** (0.05)
Current transfers	0.10** (0.05)	0.14 (0.13)	0.19* (0.12)	0.13*** (0.05)	-0.22** (0.11)	-0.09 (0.15)	0.53*** (0.14)
Lag current transfers	-0.04 (0.04)	0.08 (0.08)	-0.19** (0.08)	-0.03 (0.04)	0.31* (0.16)	-0.09 (0.08)	-0.33** (0.13)
Capital transfers	0.04 (0.11)	0.07** (0.03)	0.03 (0.11)	0.13** (0.06)	0.05 (0.30)	-0.09 (0.13)	0.52*** (0.19)
Lag capital transfers	0.10 (0.08)	0.04 (0.04)	-0.03 (0.06)	-0.05 (0.04)	-1.40*** (0.35)	0.13 (0.22)	-0.26 (0.24)
Lag debt	0.00 (0.02)	0.03 (0.03)	-0.02 (0.02)	-0.01 (0.01)	-0.02 (0.01)	0.00 (0.01)	-0.01 (0.01)
Lag rent	-0.01 (0.01)	0.02* (0.01)	-0.01* (0.01)	0.01** (0.00)	0.02** (0.01)	-0.00 (0.00)	-0.00 (0.00)
Lag unemployment rate	0.68 (0.65)	1.11 (0.71)	0.44 (0.53)	-0.12 (0.28)	0.82 (1.35)	0.68 (0.74)	0.41 (1.05)
Population density	0.86 (2.44)	-0.80 (1.68)	0.03 (0.52)	-0.55* (0.32)	-0.33 (0.61)	-0.18 (0.28)	-0.14 (0.11)
Lag population density	0.81 (2.34)	2.68 (1.92)	-0.10 (0.45)	0.14 (0.33)	-0.19 (0.53)	0.29 (0.28)	0.16 (0.13)
Share of dependents	-2.32 (6.35)	-22.93 (17.62)	-11.27 (7.95)	4.63 (5.54)	9.75 (24.70)	15.09 (12.67)	30.16*** (11.64)
Lag share of dependents	2.79 (4.94)	13.66 (13.21)	7.25 (8.47)	-3.36 (5.67)	-5.59 (22.45)	-10.97 (7.58)	-24.64** (10.60)

Share of immigration	-7.81*	-9.33**	5.47	2.58	-6.51	5.37	10.59*
	(4.61)	(3.98)	(4.15)	(3.05)	(12.73)	(4.31)	(6.16)
Lag share of immigration	5.40	-0.65	-5.40	0.60	8.24	-12.19	-8.39
	(4.29)	(3.21)	(3.59)	(3.06)	(13.72)	(8.69)	(5.92)
Mayor's tenure	4.64	12.54*	-2.64	4.56**	-4.12	4.18	-5.58
	(5.03)	(7.12)	(4.47)	(2.30)	(8.30)	(4.80)	(4.92)
Left	7.04	-12.02	23.42*	-13.75*	12.35	7.95	-42.87
	(29.18)	(29.85)	(14.01)	(8.21)	(24.72)	(16.48)	(31.00)
Right	-1.31	-15.75	15.45	-1.36	-7.47	-2.32	-42.00
	(27.26)	(20.75)	(13.42)	(7.09)	(19.62)	(7.23)	(31.19)
Majority	7.69	-10.59	7.14	3.33	-18.60	18.80	15.40
	(21.07)	(22.70)	(9.16)	(6.07)	(20.83)	(13.17)	(10.75)
Parties in government	3.47	1.84	2.10	2.96	-8.29	1.17	3.64
	(8.24)	(8.36)	(2.66)	(2.20)	(5.86)	(2.83)	(4.70)
2015 law	13.68	-1.11	23.65**	6.00	34.15	-27.16	0.86
	(17.57)	(11.92)	(10.68)	(6.59)	(28.19)	(23.79)	(12.39)
Balanced government	1.34	-17.71	-0.19	-5.72	-10.43	-4.32	-4.14
	(12.86)	(25.87)	(11.44)	(4.97)	(13.78)	(5.27)	(6.77)
Female government	59.73**	41.71	1.75	-4.03	-177.61***	-2.58	-
	(28.14)	(33.58)	(12.28)	(6.80)	(25.55)	(9.29)	
Female mayor	11.38	29.21	-15.42	-17.11**	-43.29	12.47	15.98
	(27.16)	(25.87)	(17.47)	(6.70)	(29.84)	(20.59)	(11.80)
Female mayor*Balanced government	-5.52	-4.27	-2.96	3.50	38.86	0.99	-
	(29.33)	(30.05)	(18.94)	(6.36)	(33.03)	(15.00)	
Female mayor*Female government	-56.45	-23.48	28.38	6.04	179.62	-3.45	-
	(55.89)	(65.05)	(26.32)	(7.16)	(0.00)	(0.00)	
Pre-election	35.52	7.21	-8.75	3.34	68.10**	-2.80	-10.00
	(21.86)	(9.98)	(11.55)	(4.93)	(34.28)	(7.45)	(9.74)
Pre-election*Balanced government	7.42	39.17	27.66**	-14.13*	-30.75	-8.23*	21.20
	(28.78)	(27.19)	(13.64)	(7.37)	(33.28)	(4.63)	(13.68)
Pre-election*Female government	-40.06	-22.44	12.52	0.44	27.36	0.32	-
	(27.99)	(20.55)	(14.31)	(6.48)	(0.00)	(0.00)	
Female mayor*Pre-election	-33.20	38.20	3.41	-5.28	-39.29	12.29*	-15.90
	(31.89)	(31.03)	(17.52)	(9.20)	(43.37)	(6.95)	(10.90)
Female mayor*Pre-election*Balanced government	50.42	-58.75	3.27	24.45*	29.68	36.84	-
	(52.39)	(38.59)	(21.21)	(13.86)	(45.50)	(51.81)	

Female mayor*Pre-election*Female government	97.59 (63.14)	-102.17 (78.96)	-57.44*** (20.62)	8.73 (10.50)	189.71 (0.00)	-5.80 (0.00)	-
Number of observations	672	672	410	410	119	119	186
Number of municipalities	75	75	46	46	15	15	22

Notes: We employ the bias-corrected fixed effect estimator proposed by Breitung et al. (2022). Cluster-robust standard errors are used (clusters: number of municipalities). Coding of dependent variable is based on the classification provided in Section 4.2 (see Table A1 of the Appendix). *, **, and *** indicate significance at a 10%, 5%, and 1% level, respectively.

Table A3: Pre-electoral year long-term average marginal effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Mandatory			Non-Mandatory		
	All	Male mayor	Female mayor	All	Male mayor	Female mayor
<u>Level0 municipalities</u>						
Less 40% women	46.06*	58.30*	3.81	18.41	8.40	52.93*
	(27.68)	(32.08)	(43.61)	(11.62)	(12.09)	(30.93)
Between 40%-60% women	76.83**	70.48**	98.75	48.68**	54.07**	30.11*
	(31.84)	(34.50)	(65.43)	(23.17)	(27.57)	(15.77)
More 60% women	16.29	-7.45	98.22	-34.51	-17.76	-92.33
	(31.09)	(35.56)	(87.61)	(27.27)	(20.82)	(91.87)
<u>Level1 municipalities</u>						
Less 40% women	-19.42	-21.95	-13.39	3.16	5.93	-3.45
	(23.35)	(31.67)	(28.91)	(6.83)	(8.80)	(13.60)
Between 40%-60% women	52.40**	47.46*	64.22**	-9.12	-19.17	14.88
	(25.07)	(27.12)	(31.78)	(9.42)	(12.73)	(10.96)
More 60% women	-30.54	9.48	-126.12***	8.52	6.72	12.85**
	(18.80)	(20.03)	(43.57)	(6.18)	(8.35)	(5.03)
<u>Level2 municipalities</u>						
Less 40% women	96.16**	113.82**	48.15	0.61	-3.41	11.55
	(40.13)	(56.38)	(32.75)	(10.69)	(8.52)	(17.65)
Between 40%-60% women	58.10***	62.43***	46.36	2.66	-13.43	46.38
	(17.85)	(14.11)	(36.17)	(8.04)	(8.76)	(40.78)
More 60% women	NA	NA	NA	NA	NA	NA
<u>Level3 municipalities</u>						
				<u>Classic PBC</u>		
Less 40% women	NA	-28.28	NA	52.65***	52.39**	53.45
		(29.98)		(19.63)	(21.77)	(37.97)
Between 40%-60% women	23.94	31.68	-13.30	44.36**	46.84**	36.64
	(22.27)	(27.51)	(20.80)	(18.94)	(22.28)	(32.84)
More 60% women	NA	NA	NA	-7.15	2.81	-38.09
				(33.65)	(21.02)	(127.36)

Notes: Cluster-robust standard errors are used. *, **, and *** indicate significance at a 10%, 5%, and 1% level, respectively.

NA indicates that there are not enough observations to estimate the effect.

Table A4: Female mayor long-term average marginal effects

	(1)	(2)	(3)	(4)
	Mandatory		Non-mandatory	
	Non- pre- election	Pre-election	Non- pre- election	Pre-election
<u>Level0 municipalities</u>				
Less than 40% women	18.68 (44.34)	-35.81 (57.19)	34.05 (34.06)	78.58* (43.66)
Between 40–60% women	9.62 (35.50)	37.89 (66.99)	29.07 (23.82)	5.12 (25.24)
More than 60% women	-73.97 (68.91)	31.71 (94.72)	6.68 (60.42)	-67.90 (72.32)
<u>Level1 municipalities</u>				
Less than 40% women	-38.70 (43.67)	-30.15 (28.43)	-30.37*** (10.68)	-39.75*** (15.11)
Between 40–60% women	-46.12* (25.81)	-29.36 (32.97)	-24.16** (11.66)	9.88 (19.85)
More than 60% women	32.51 (59.56)	-103.09*** (32.15)	-19.65 (12.93)	-13.52 (14.14)
<u>Level2 municipalities</u>				
Less than 40% women	-72.35 (51.57)	-138.02* (82.92)	15.18 (22.91)	30.14* (15.90)
Between 40–60% women	-7.41 (47.88)	-23.48 (38.19)	16.38* (9.77)	76.20 (52.16)
More than 60% women	NA	NA	NA	NA
<u>Level3 municipalities</u>			<u>Classic PBC</u>	
Less than 40% women	NA	NA	34.83 (28.75)	35.89 (46.98)
Between 40–60% women	45.18 (38.85)	0.20 (26.37)	-0.68 (19.77)	-10.88 (38.57)
More than 60% women	NA	NA	1.65 (82.07)	-39.25 (115.70)

Notes: Cluster-robust standard errors are used. *, **, and *** indicate significance at a 10%, 5%, and 1% level, respectively. NA indicates that there are not enough observations to estimate the effect.