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Working Paper

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ZEW Discussion Papers, No. 14-099

Provided in Cooperation with:
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Suggested Citation: Foremny, Dirk; Freier, Ronny; Moessinger, Marc-Daniel; Yeter, Mustafa (2014) : Overlapping political budget cycles in the legislative and the executive, ZEW Discussion Papers, No. 14-099, Zentrum für Europäische Wirtschaftsforschung (ZEW), Mannheim, https://nbn-resolving.de/urn:nbn:de:bsz:180-madoc-373931

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https://hdl.handle.net/10419/104718

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November 25, 2014

Abstract

We advance the literature on political budget cycles by testing separately for cycles in expenditures for elections in the legislative *and* the executive. Using municipal data, we can separately identify these cycles and account for general year effects. For the executive branch, we show that it is important whether the incumbent re-runs. To account for the potential endogeneity associated with this decision, we apply a unique instrumental variables approach based on age and pension eligibility rules. We find sizable and significant effects in expenditures before council elections and before joint elections when the incumbent re-runs.

Keywords: election cycles, municipal expenditures, council and mayor elections, instrumental variables approach
JEL Classification Numbers: H11, H71, H72, H74

We would like to thank Florian Ade, Peter Haan, Niklas Potrafke, Friedrich Schneider, Johannes Voget as well as seminar participants at the ZEW Mannheim for helpful comments and suggestions. We are greatly indebted to Fabian Franke, Jenny Freier, Kathrin Friedrich, Heike Hauswald, Ilknur Köysüren, Larissa Lehn and Marc Schmidt who provided excellent research assistance. Ronny Freier (project: 10.12.2.092) as well as Marc-Daniel Moessinger and Mustafa Yeter (project: 10.12.1.094) gratefully acknowledge financial support from the Fritz Thyssen foundation. Dirk Foremny gratefully acknowledges financial support from projects ECO2012-37131 (Ministerio de Educacíon y Ciencia) and 2014SGR420 (Generalitat de Catalunya). The usual disclaimer applies. The authors declare that they do not have relevant or material financial interests that relate to the research described in this paper.

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1. Introduction

Originating with Nordhaus (1975), a main paradigm of the political economics literature is that political agents act rational when deliberately manipulating the economy or particular fiscal aggregates to gain an electoral advantage. Further theory (e.g., Rogoff and Sibert, 1988 and Rogoff, 1990) has confirmed the main prediction of this paradigm even under rational expectations of the voters.[1] While the early empirical literature looked for cycles in macroeconomic aggregates such as unemployment and inflation[2], more recent work highlighted credible evidence for political budget cycles (henceforth, PBC) in fiscal aggregates such as debt, expenditures, and its composition (see Keech and Pak, 1989, Alesina et al., 1997, or Brender and Drazen, 2005).[3] Overall, the phenomenon of PBC is relatively well understood and the empirical evidence is highlighting the relevance in actual policy making.

This paper aims to contribute to this literature in two ways. First, we study PBCs in expenditures for elections in the legislative *and* the executive. The existing literature mostly had to focus on the legislative branch or on joint elections. Our data and institutional design provides us with the unique opportunity to study the cycles of the two institutions separately and evaluate the effects of overlaps. Second, for the analysis of PBCs in the executive, we highlight the concerns related to the endogenous decision of incumbent executives to re-run. Overcoming this endogeneity is crucial as we expect PBCs only when the incumbent competes for re-election. Here, we use an instrumental variables approach based on the age of the incumbent as well as on pension eligibility rules to achieve credible identification. To the best of our knowledge, both innovations have not been treated in the literature.

The testing ground for our analysis is the German municipal level. Our paper is therefore related to the literature that focuses on the sub-national level. In Table A.1 in the appendix, we provide a detailed and exhaustive overview of papers studying PBCs in expenditures at the sub-national level which relate directly to our first contribution. Evidence for cycles in expenditures has been documented on state, regional and municipal level in twelve different countries. Most studies focus on legislative elections and use variation over time to separate election effects from general year effects.[4] Apart from the papers in Table A.1, we identified

[1] Alternatively, Persson and Tabellini (2000), and Shi and Svensson (2006) provide a theoretical foundation for political budget cycles under rational expectations and moral hazard. Also, a second strand of theoretical work relates to partisan cycles (e.g., Hibbs, 1977; Alesina, 1987, 1988a) which explains electoral cycles by shifts in political ideology.

[2] Studies finding only weak or no evidence for cycles in real macroeconomic aggregates include, among others, Lächler (1978), Golden and Poterba (1980) and Alesina et al. (1997).

[3] Further evidence at the national level is provided by Alesina (1988b), Alesina et al. (1992), Schuknecht (1999), Potrafke (2012), and Klomp and De Haan (2013).

[4] Note that the literature here is divided into papers that study the size of aggregate expenditures close to elections (similar to our question) and several authors testing for PBCs in the composition of expenditures. Evidence for the latter case was first presented by Blais and Nadeau (1992) and Kneebone and Mckenzie (2001) for Canada and later by Drazen and Eslava (2010), Veiga and Veiga (2007b) and Akhmedov and Zhuravskaya (2004) in the case of municipal or regional legislative elections in Colombia, Portugal and Russia respectively. Common to all their results is a shift in expenditures especially to

three studies that are of particular importance for us. Using alternative outcome variables and focusing on council elections in Germany, Foremny and Riedel (2014) (taxes), Englmaier and Stowasser (2013) (saving banks lending) and Mechtel and Potrafke (2013) (unemployment) provide evidence that PBCs are of large significance in Germany.[5] Furthermore, in a recent working paper, Furdas et al. (2014) analyse a related question of how PBCs evolve in different federal tiers.

For the second part of the paper, the related literature is comparatively small. Only few papers have looked at PBCs in the executive branch (e.g., Rose, 2006; Alt and Rose, 2009). The reason is that the executive is often not elected directly by the voter. And even if separate elections are held, the timing of those elections often coincides with the legislative. The two papers that are closest to our approach are by Rosenberg (1992) for Israel and Aidt et al. (2011) for Portugal. Both papers study combined municipal elections and control directly for whether the incumbent executive re-runs in the election.[6] Our contribution here is that we treat the endogeneity of the incumbent's decision to re-run with an instrumental variables approach.

The particular data that we use come from German municipalities in the states of *Bavaria* and *Baden-Württemberg* (henceforth BAY and BW respectively) covering the period between 1992-2006. To our advantage, the two states are comparable in many dimensions. Both have had direct mayoral elections for a long time, use a comparable constitutional design governing the affairs of local municipalities and are comparable in population size as well as economic performance. For both states, we observe expenditures for the entire universe of municipalities throughout the sample period. Complementing the spending data, we collected data on elections (mayoral and council elections), other fiscal measures (state transfers) and important socio-economic characteristics (population, municipal age structure, ideological indicators for councils and mayors). For BAY, we indeed have full information on the entire set of variables. In BW, all information is available except for the mayoral elections data which we had to survey town by town (see section 3).

Crucial for the validity of our empirical analysis is the fact that state law regulates election cycles and that election dates are therefore set exogenous with very little or virtually no influence on the timing by municipalities.[7] The council elections in BAY and in BW are held

categories with high visibility for the electorate.

[5] Earlier studies for Germany involve Seitz (2000), Galli and Rossi (2002) as well as Schneider (2010) and test for PBCs in total expenditure and deficits. Rather than on the municipal-level, as it is the case in our analysis, these studies rely on state-level data and elections.

[6] There is also some indirect evidence that expenditure manipulation may indeed be a good strategy for an incumbent. Freier (2011) provides evidence that the voters reward incumbent mayors that succeeded in raising the level of expenditures prior to election, but at the same time fail to punish the running mayor for increases in debt. Veiga and Veiga (2007a) confirm this pattern using Portuguese data.

[7] In case of council elections, individual municipalities in BAY or BW have no influence whatsoever. In case of mayoral elections, exceptions are given by cases in which the town council may recall the mayor and thereby in principle can manipulate the timing of elections. This, however, only occurred in a negligible number of towns, see Kern (2008). The term of the mayor may also end prematurely due to

on state-specific dates which are identical for all municipalities in the respective state. In contrast, regulations with respect to mayoral elections differ between states. While election dates for the executive branch in BAY are aligned with council elections, BW exhibits municipal-specific dates which differ from dates of council elections (see section 4). Given this institutional structure of election dates, we can identify PBC both in mayoral as well as in council elections *and* separate those effects from general year effects.

Our main results are threefold. First, we identify sizable and significant increases in total expenditures in pre-election years for the legislative branch. These results are in the range of 1.3–1.8 percent of total expenditures and remain stable through all our robustness tests. For a middle-sized town of 10,000 inhabitants, this amounts to additional spending in the order of about 300,000 Euro in the year prior to the election. Second, we find that these fiscal cycles in council elections are unaffected by the timing of mayoral elections. Third, we show that there is an effect of overlapping cycles conditional on the incumbent's decision to re-run for office. Municipal expenditures increase in joint pre-election and election years if the incumbent mayor seeks for re-election and increase in joint post-election years if the mayor did not re-run. For instance, given that the incumbent mayor enters the race for office again, municipal spending in overlapping pre-election years is 5.5 percent higher than in the counterfactual situation when the incumbent mayor does not seek re-election.

The paper is organized as follows. Section 2 discusses the institutional setting, whereas section 3 presents our data and descriptives. In section 4 we lay out the empirical strategy, section 5 discusses the main results and section 6 presents the sensitivity analyses. Section 7 concludes.

2. Institutional background

The municipal level in Germany is the lowest of three governmental tiers.[8] Within this structure, the municipalities are responsible for a significant share of the overall state activity.[9] Among other things, municipalities are responsible for general administration, public order, cultural expenditures, infrastructure and public transport. Also, towns often oversee local public firms and administrate expenditures from higher-level tiers (e.g., expenditures on social welfare). Despite the often complex division of tasks between the different tiers, the municipalities (especially in BAY and BW) retain considerable discretion in spending decisions.

death or sickness (arguably exogenous) or resignation (potentially endogenous). We discuss these issues in more detail in section 4.

[8] Besides the federal level, there exist 16 federal states and about 12,500 municipalities (organized in about 450 counties).

[9] Municipalities in BW sign responsible for 52.9% of all expenditures in the state which is above the German average (this includes municipal budgets as well as state-own companies under the control of the local towns). Municipalities in BAY administrate 49.7% (see Federal Statistical Office, 2011).

Municipalities in Germany are governed by an elected council and an elected mayor. Councils act as the legislative body of the local town or municipality and mayors can be viewed as the executive branch.[10] While councils are elected in open list proportional elections, majoritarian elections are held to determine the race for the local mayor.[11] In BAY, the council and the mayor are elected for six years on (generally) the same statewide election day.[12] In contrast to this, election terms of mayors and councils in BW are of different length and election days differ accordingly: the local mayor is elected for eight years, while council elections are held every five years. Furthermore, only the council elections are held on the same statewide day, whereas the election dates for mayors are municipality specific, i.e., each municipality has its own electoral cycle for mayoral elections.

We illustrate the distribution of mayoral and council elections over time in Figure 1. Within the time coverage of this study, we observe council elections held in 1996 and 2002 in BAY and in 1994, 1999, and 2004 in case of BW. In BAY, mayoral elections generally run parallel with council elections. However, some mayoral election cycles deviate from the general rule due to prematurely ended terms. This is the case for 689 mayoral elections (16% in relation to 4114 council elections). In contrast, mayoral elections in BW spread evenly throughout the years and only randomly overlap with council elections (15% in relation to 3303 council elections).[13]

Crucial for the validity of our empirical analysis is the fact that the timing of local elections (council as well as mayoral) is regulated by state law and is for the most part outside of the control of the individual municipality. The timing of the council elections is fixed entirely by given state-wide election terms and is therefore exogenous.[14] While in principle this is also true for mayoral elections, the mayor's term may potentially deviate from these general rules. In particular, the mayor's term may end prematurely and necessitates new elections

[10] Note that the local mayor is also a voting member of the council. Generally, the mayor is in charge of the administration, she prepares all decisions of the municipalities and oversees the implementation. Also, she is often the only full-time working politician in the town.

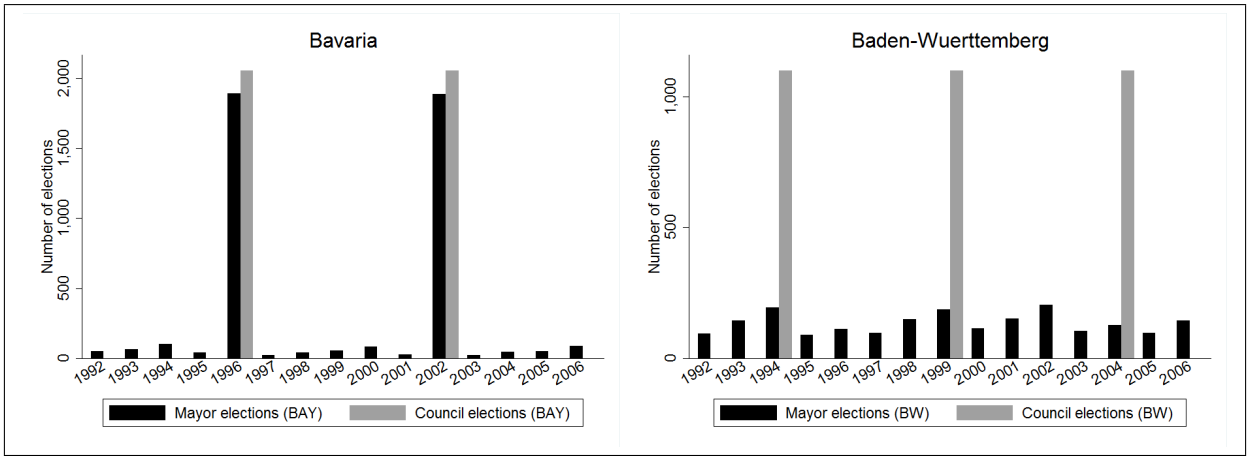
[11] The electoral rules in BAY and BW are quite similar. There are, however, also subtle differences. For council elections, both states have open-list proportional elections where voters have as many votes as there are seats in the council (which allows for vote-splitting and cross-voting). There exist no explicit hurdles for small parties. BW uses a Sainte-Lague and BAY (a two-step) D'Hondt seat allocation mechanism. For mayoral elections, both states use a two-round majoritarian procedure. If no candidate obtains the absolute majority in the first round, a second election must be held. In BAY, this second election is a classical run-up election between the two leading candidates. In BW, the second election is open (even new candidates are allowed) and first-past-the-post.

[12] There are exceptions to that rule, when mayor election terms ended prematurely. In this case, a Bavarian municipality might have an independent mayoral election for one term with the requirement to align with the state-wide election dates again in the second subsequent election.

[13] Note that these deviations remain if we restrict the calculations to those municipal-year observations that are included in our estimations, i.e., mayoral and council election years in BW randomly overlap in 14.7%, while mayoral election years in BAY deviate from council election years in 10.7% in relation to the number of council elections.

[14] There is no option for pre-mature elections for the council. As there are no formal coalition agreements, it cannot happen that a government breaks down. Also, if, a council member dies in office or resigns due to personal reasons, she is automatically replaced by a successor.

Figure 1: Number of council and mayoral elections in BAY and BW



due to a number of reasons. First, the citizens or the council may recall the mayor.[15] Second, the mayor may die or resign for personal (e.g., sickness) or political reasons (lack of political support). A third reason causing deviations from the predefined length of political terms is given by existence of strict age limits inhibiting incumbents to serve beyond the age of 68 in case of BW.[16]

Focusing on BAY and BW in a sub-national study on PBC is attractive due to several reasons. First, historically, both states have had direct mayoral elections already since World War II. This stands in contrast to all other German states which introduced direct mayoral elections starting in the mid-1990s (see Ade and Freier, 2013). As a consequence, we cannot study individual PBCs in mayoral and council elections in other states earlier than the 2000s.[17] Furthermore, since the mayor is automatically a voting member of the council in both states, studying the overlap of individual cycles is interesting, as the institutional setting may leave room for collusion between both political branches.

Second, the constitutional framework that governs the affairs of the local level follows a comparable standard in BAY and BW. Both states apply a constitutional setting that is referred to as *Süddeutsche Ratsverfassung*. Important for our study, this particular constitutional setting grants extensive rights and duties to the position of the mayor. Again, this partly stands in contrast to the institutional structure in other German states, in particular when it comes to expenditures.

Third, the two states in our analysis are comparable along many other dimensions. Both are located in direct vicinity in the South of Germany. Given the time coverage of this study, both states have had conservative state rule throughout.[18] Also, both states are of

[15] While this option is a constitutionally guaranteed right of the citizens and the council, we almost never observe this in the time period covered in this study.

[16] We further discuss the importance of premature mayoral elections in our section on identification (see section 4).

[17] And even then, evidence from those other German states would be particular as these mayoral elections are only newly introduced.

[18] BAY have had absolute majorities of the conservative party throughout the time coverage of this study.

comparable size and population.[19] Finally, BAY and BW are of comparable wealth and industrial performance.[20] In both states, the municipalities are financially well off, the level of debt is comparatively low and the towns enjoy extensive financial liberties.[21]

3. Data

We use data from municipalities in BAY and BW for the period from 1992 to 2006.[22] We observe 2,056 municipalities and a population of 12.5 million inhabitants in BAY and 10.5 million inhabitants live in 1,101 municipalities in BW.

We obtained information on our outcome variable total expenditures, state transfers, results for the council elections, information on local population as well as population structure from the respective state statistical offices. We calculate municipal expenditures net of transfers, i.e., we subtract the amount of transfers from the respective state government from gross expenditures. This is crucial in order to capture and isolate the discretionary amount of spending by municipalities and to get rid of confounding influences such as spending which is initiated by an upper level governmental tier and is only administered at the municipal level. Beyond that, this transformation helps us to abstract from PBCs in the state level elections, which potentially could otherwise alter municipal budgets through transfers (see Furdas et al., 2014).

From the data for the council elections, we create dummy variables that identify a council pre-election, election or post-election year to capture the legislative PBC. Furthermore, we classify councils by the share of left parties (party members of the social democrats (SPD) and the green party (Grüne)). We summarise all relevant descriptive information in Table 1. We further explain our variable coding in Table A.2 in the appendix.

In BW, the conservative party also headed the state government, however, they did so as the predominant party in a coalition.

[19] As a consequence, also the municipal structure is quite comparable. While BW has slightly larger municipalities on average, these differences are rather small compared to structures in other German states. Together, the two states account for more than 25% of the German population.

[20] Together they account for approximately 75% of the total state redistribution in the German fiscal equalization scheme (see Heinemann et al., 2013).

[21] Municipalities in other German states might have very limited financial opportunities for extraordinary investment projects or other general pork barrel spending before elections.

[22] The time coverage of this study is limited by the availability of data on municipal spending (*Jahresrechnungsstatistik*). Also, data for earlier mayoral elections in BW is hard to obtain.

Table 1: Sample description

Variable	Observations	Mean	Std. Dev.	25 %ile	Median	75 %ile	Minimum	Maximum
Total expenditures in logs (net of transfers)	39 554	15.509	1.145	14.686	15.364	16.186	11.689	22.557
Council elections								
Pre-election year	39 554	0.148	0.355	0	0	0	0	1
Election year	39 554	0.153	0.360	0	0	0	0	1
Post-election year	39 554	0.155	0.361	0	0	0	0	1
Mayor elections								
Pre-election year	39 554	0.130	0.336	0	0	0	0	1
Election year	39 554	0.134	0.340	0	0	0	0	1
Post-election year	39 554	0.132	0.339	0	0	0	0	1
Dummy incumbent runs again	39 554	0.739	0.439	0	1	1	0	1
Dummy full time mayor	39 554	0.608	0.488	0	1	1	0	1
Dummy left mayor	39 554	0.134	0.341	0	0	0	0	1
Age of the mayor	39 554	51.534	8.398	46	52	57	25	85
Share left parties in council	39 554	0.138	0.153	0.000	0.083	0.250	0	0.714
Population	39 554	7.124	28.438	1.732	3.141	6.135	0.096	1280.610
Population squared	39 554	0.859	26.815	0.002	0.009	0.037	0.000	1639.962
Share population $<$ 15 years	39 554	0.180	0.024	0.164	0.180	0.196	0.066	0.343
Share population $\geq$ 65 years	39 554	0.171	0.046	0.136	0.161	0.200	0.054	0.462
State elections								
Pre-election year	39 554	0.202	0.401	0	0	0	0	1
Election year	39 554	0.216	0.412	0	0	0	0	1
Post-election year	39 554	0.196	0.397	0	0	0	0	1
Instruments for incumbent runs again								
Dummy mayor is older than 60 years	39 363	0.312	0.463	0	0	1	0	1
Dummy mayor is pensionable	39 363	0.353	0.477	0	0	1	0	1

Notes: The table shows the descriptive statistics for the sample. We present sample means, standard deviations, mimimum and maximum figures, median as well as the 25% and the 75% percentiles of the distributions for the variables indicated in the left column. In total, we include data from 2049 municipalities in BAY and 968 municipalities in BW.

In Table A.3 in the appendix, we highlight municipal characteristics of the final sample for BW for which we ultimately obtained adequate information on mayoral elections and compare these characteristics with information on the counterfactual full universe. Compared to the total number of 1,101 municipalities and 16,515 municipal-year observations, the estimation sample comprises only 968 municipalities and significantly less years (10,531 municipal-year observations). Especially small municipalities are lost due to missing information on mayoral elections.[23] This is plausible given our research strategy that was based on a questionnaire which smaller municipalities with less municipal staff might not be able to answer. However, we argue that our results do not suffer from a bias given the small differences in the variable means between the two groups.

Obtaining comprehensive data on mayoral elections in BW is a challenging task. While complete administrative data on elections is provided for BAY by the state statistical office, such data do not exist for BW.[24] Due to this lack of official data, we collected data manually by contacting and surveying all 1,101 municipalities with respect to the dates of past mayoral elections. Using obtained responses, we then searched regional newspapers as well as official announcements (*Staatsanzeiger Baden-Württemberg*) to identify further information on the specific election, e.g., the name, age, party affiliation and regular occupation of the elected mayor as well as information on whether the mayor has ran for re-election. Finally, we conducted an intensive internet search on official websites and free internet resources to fill further gaps in our data set.

Similar to council elections, we code a set of dummy variables for mayoral elections indicating the pre-election, election and post-election year in each municipality. Furthermore, we construct dummy variables for mayors indicating a membership of a left-wing party (member of the social democrats (SPD) or the green party (Grüne)), whether the mayor has a full-time position and whether the incumbent mayor re-runs for office in the current election. As the incentives to strategically manipulate public spending should especially be higher in case of the latter, we will construct respective interactions in order to capture the impact on the formation of PBCs. Finally, we include the mayor's age as a further control variable in our regressions which will also be relevant against the background of our instrumental variables approach.

As mentioned above, mayoral cycles may end prematurely due to resignation or death of the mayor. As this may potentially pose problems for the identification of electoral cycles, we exclude non-completed or prematurely ended political terms from our baseline specification. When testing the robustness of our main results, we also run estimations in which we include

[23] The p-values of the mean comparison t-test further show that the difference in the means is statistically significant, i.e., we cannot reject the null hypothesis that there is no difference in the means of the control variables.

[24] We contacted all major authorities such as the state statistical office, the association of municipalities, the state ministry of interior affairs and the state election office. No summary of official data exists for mayoral elections in BW.

all available observations including non-completed terms.

4. Identification

We use the following baseline model to identify political budget cycles in expenditures:

$$
\begin{aligned}
log(Y_{i,t}) = \mathbf{t'^{c}_{i,t}}\boldsymbol{\delta} + \mathbf{t'^{m}_{i,t}}\boldsymbol{\phi} + I_{i,t}\theta + \sum_{k=-1}^{1}(t^{c}_{i,t+k} \times t^{m}_{i,t+k})\beta_{k+2} + \sum_{k=-1}^{1}(t^{m}_{i,t+k} \times I_{i,t})\tau_{k+2} \\
+ \sum_{k=-1}^{1}(t^{c}_{i,t+k} \times I_{i,t})\pi_{k+2} + \sum_{k=-1}^{1}(t^{c}_{i,t+k} \times t^{m}_{i,t+k} \times I_{i,t})\sigma_{k+2} + \mathbf{X'_{i,t}}\boldsymbol{\gamma} \\
+ \lambda_t + \mu_i + h(t,s) + \epsilon_{i,t}.
\end{aligned}
\tag{1}
$$

The dependent variable is the natural logarithm of municipal total expenditures, net of transfers, $Y_{i,t}$. The vectors $\mathbf{t'^{c}}$ and $\mathbf{t'^{m}}$ contain dummies capturing election dates in council (c) and mayoral (m) elections, respectively. In particular, we define these dummies for respective elections $j = c, m$ as

$$
\mathbf{t'^{j}} = \begin{bmatrix} t^{j}_{t-1} \\ t^{j}_{t} \\ t^{j}_{t+1} \end{bmatrix} \text{ and } \begin{cases} =1 \text{ in the pre-election year, 0 otherwise} \\ =1 \text{ in the election year, 0 otherwise} \\ =1 \text{ in the post-election year, 0 otherwise.} \end{cases} \tag{2}
$$

To test for differences in spending if cycles overlap, we estimate interaction terms for congruent pre-, post-, and election years as in Foremny and Riedel (2014). The dummy variable $I_{i,t}$ denotes whether the incumbent mayor re-runs for office at the next election. The indicator is set to zero/one for the whole election period, i.e., we assume that the mayor already knows whether she will re-run for office at the end of her term when she takes office.[25] As a result, the estimation coefficient of the incumbent indicator only reveals spending differences between electoral periods. The estimation of interaction terms with the mayoral election dummies then allows separating general from specific incumbent effects in times of elections. Finally, the triple interactions capture effects of overlapping cycles conditional on the incumbent's decision to re-run for office.

We include general year (λ_t) and municipality (μ_i) fixed effects into the model and allow for state-specific linear and quadratic time trends which we denote by $h(t,s)$. Additional control variables are denoted by $\mathbf{X'_{i,t}}$ and include population and population squared to control for non-linear effects of local population size, population structure indicators, state

[25] We assume that the mayor, at least, has some preferences about this decision which lead to the final decision at the end of her term. Note that, without this assumption, we would condition the incumbent dummy on election years which would render separating general from specific incumbent effects unfeasible.

election indicators, ideological proxies for both the mayor and the council, the age of the mayor and a dummy variable indicating whether the mayor is a full-time politician.

It is important to highlight again how our estimation specification identifies PBCs in council and mayoral elections. As council elections in BAY and BW are held in different years, the effects of council cycles can be separated from general year effects and from state-specific time trends. In contrast, the identification for the mayoral elections is more involved. As highlighted in section 2, mayoral elections in BAY are generally held at the same time as council elections with few exceptions. In BW, however, we observe mayoral elections across all years which are independent from council elections. This is the source of variation, including overlapping as well as non-overlapping elections, we exploit in order to identify individual mayoral election cycles.

A further important condition for the identification of cycles is the exogeneity of election dates. In case of council elections, terms are entirely predetermined by state regulation and cannot be influenced by individual municipalities. While for mayoral elections this is generally true as well, the municipality (and/or the mayor) may influence the timing of elections within limits. In particular, the term of the mayor may end prematurely when 1) the citizens or the council recall a mayor (which is an extremely rare event), 2) the mayor dies or resigns due to sickness (arguably exogenous to our application) or 3) the mayor resigns for other reasons (personal or political reasons).[26] In our baseline specification, we therefore decided to rely exclusively on fully completed mayoral election terms. This ensures that election dates are exogenous and predetermined by state regulation only (eight years in BW and six years in BAY). In the robustness section, we test the sensitivity of our results by including terms that ended prematurely. The results remain similar both in terms of size and significance.

Another issue that might be raised with respect to endogeneity is given by the incumbent's decision to re-run for office. In particular, if this decision is directly linked to the fiscal conditions of the municipality and the availability of sufficient financial means for strategic spending, estimates could not be interpreted as causal. For instance, if a fiscal shock hits the municipality shortly before an election absorbing available financial means initially intended for strategic spending and ultimately inducing the incumbent not to seek re-election, we would falsely attribute pre-election variation in spending to mayoral cycles in cases of incumbents not re-running for office.[27] To deal with this potential endogeneity formally, we follow an instrumental variables approach.

[26] It is clear that a mayor will not return to office if the term ends prematurely due to early resignation. One main reason for resignations in our data is given by mayors taking office in a larger city involving a higher remuneration. While the decision to run for office in another municipality is potentially endogenous, the timing is again exogenous as it is predetermined by the timing of elections in other towns.

[27] Note that a potential incompetency of the mayor would not cause such a pattern. This is the case as incompetency might influence the municipal fiscal position negatively throughout the whole term and is not necessarily attributed to the years around an election.

To this end, we use two different instruments (explained below) to account for the potential endogeneity of the incumbent indicator. However, implementing an instrumental variables approach in the context of our estimation specification (see equation (1)) is associated with increased complexity because the incumbent variable is used both as individual as well as interaction variable. This results in the fact that separate first-stage regressions are necessary to instrument for the single variable and the interaction terms. The procedure is exemplary shown in Equations (3.1) to (4) for the interaction of the incumbent dummy and the mayoral election dummies. In a first step, we separately regress the incumbent dummy (equation (3.1)) and its interactions with the mayoral election dummies (equation (3.2)) on the set of instruments, i.e., the single instruments $\mathbf{Z_{i,t}}$, their interactions with the mayoral election dummies ($\mathbf{t'^{m}_{i,t}} \times \mathbf{Z_{i,t}}$), and the full set of the remaining covariates $\mathbf{C'_{i,t}}$. In a second step, we use the predicted values for the incumbent indicator and its interactions as regressors in the second stage regression (equation (4), see Angrist and Pischke (2009, p. 190ff) and Wooldridge (2010, p. 267f) for more information).[28]

$$I_{i,t} = \mathbf{t'^{c}_{i,t}}\boldsymbol{\alpha_1} + \mathbf{t'^{m}_{i,t}}\boldsymbol{\alpha_2} + \mathbf{Z_{i,t}}\boldsymbol{\alpha_3} + (\mathbf{t'^{m}_{i,t}} \times \mathbf{Z_{i,t}})\boldsymbol{\alpha_4} + \mathbf{C'_{i,t}}\boldsymbol{\alpha_5} + \xi_{i,t} \tag{3.1}$$

$$(\mathbf{t'^{m}_{i,t}} \times \mathbf{I_{i,t}}) \equiv \mathbf{TI_{i,t}} = \mathbf{t'^{c}_{i,t}}\boldsymbol{\kappa_1} + \mathbf{t'^{m}_{i,t}}\boldsymbol{\kappa_2} + \mathbf{Z_{i,t}}\boldsymbol{\kappa_3} + (\mathbf{t'^{m}_{i,t}} \times \mathbf{Z_{i,t}})\boldsymbol{\kappa_4} + \mathbf{C'_{i,t}}\boldsymbol{\kappa_5} + \varsigma_{i,t} \tag{3.2}$$

$$log(Y_{i,t}) = \mathbf{t'^{c}_{i,t}}\boldsymbol{\delta} + \mathbf{t'^{m}_{i,t}}\boldsymbol{\phi} + \widehat{I}_{i,t}\theta + \widehat{\mathbf{TI}}_{\mathbf{i,t}}\boldsymbol{\pi} + \mathbf{X'_{i,t}}\boldsymbol{\gamma} + \lambda_t + \mu_i + h(t,s) + \epsilon_{i,t} \tag{4}$$

Fortunately, the institutional design allows us to construct a set of instruments to get consistent estimates, as they are uncorrelated with the error term of equation (1), but highly correlated with the mayor's decision to re-run for office. We use the following variables and their interactions with the election dummies to instrument the incumbent indicator, all of which we derived from a careful exploitation of the features of the municipal electoral law:[29]

First, we create a dummy variable which is set to one if the mayor is eligible to receive pensions (*dummy mayor is pensionable*). In both states, in general, the mayor is only eligible to receive pensions if she has served as a temporary civil servant for a particular number of years and has completed at least one entire electoral term.[30]

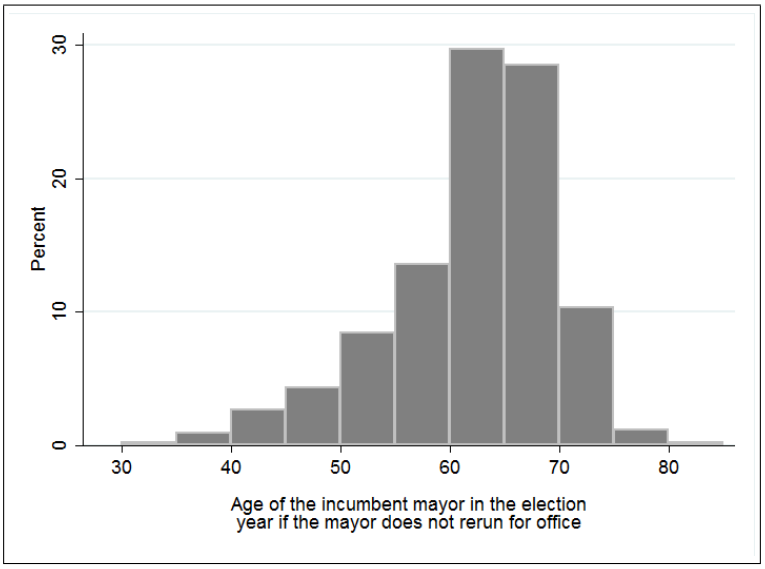
[28] One might falsely consider to estimate the first stage regression exclusively for the single instrument and the incumbent dummy and subsequently compute the interaction term for the second stage regression manually by using the predicted values of the incumbent indicator. This procedure, however, will produce inconsistent estimates. The results of the first stage regression for the incumbent dummy is presented in Table A.5 in the appendix. The results of the remaining first stage regressions for the interaction terms are available upon request. $\mathbf{C'_{i,t}} \equiv \mathbf{X'_{i,t}} + \lambda_t + \mu_i + h(t,s)$.

[29] Again, as for the incumbent runs again dummy variable, both indicators are equal to zero/one for the whole election period.

[30] In BAY, the mayor is eligible to receive pensions if she has served for two complete election periods and was not re-elected at the next election or refused to accept the election. In BW, the ruling is more complex: The mayor is eligible to receive pensions if she has completed the entire election period and a) has served for 18 years and is older than 47 years in the year of the election, b) has served for two electoral terms or c) has served for eight years and is older than 60 years in the year of the election. For

Second, we create a dummy variable which is equal to one if the mayor is older than 60 years in the year of the mayoral election (*dummy mayor is older than 60 years*). This threshold is motivated by the age distribution of incumbent mayors not re-running for office in the year of election (see Figure 2). There is a significant break in the distribution at the age of 60 years, i.e., mayors older than 60 years are less likely to seek re-election.

Figure 2: Age distribution for mayors who do not rerun for office in the election year



The two instruments we constructed fulfill both necessary conditions for an instrumental variables regression: they are relevant in terms of explaining the mayor's decision to run for re-election (mayors above the age of 60 years and mayors who are eligible to receive pensions have less incentives to run for re-election) but are exogenous to local expenditures. In case of the latter, there is no direct link between pension eligibility and public spending. With respect to the mayor's age, in contrast, one might argue that older mayors might have different preferences shaping their spending behavior. However, we account for this possibility by directly controlling for the mayor's age in the regressions. Note that this indicator is insignificant throughout all specifications (see Table A.4 in the appendix).

5. Results

Tables 2 to 4 present the main results of our estimations. Results of the fixed effects OLS regression are reported in Table 2, while Table 3 presents the results for the instrumental variables approach. In both tables, we only show the results for our main variables of interest (council and mayoral election dummies, the incumbent runs again dummy as well as the various interaction effects). The results for the control variables are presented in the

further details see Article 21 KWBG (*Law on local elections and public servants*) (BAY) and §36ff LBG (*Law on state public servants*) (BW).

appendix (see Table A.4).[31] As some of our hypotheses are based on interaction terms and the respective sum of individual coefficients, we refer to Table 4 which presents F-tests of joint significance for the (combination of) estimated effects and is therefore complementary to the other two tables.

Tables 2 and 3 are structured in the same way: in columns (1) and (2), we specify simple PBC models in which we study the council and mayoral election effects separately. While column (1) shows the results for the council elections, effects of the mayoral elections are modeled in column (2). In column (3), we combine both cycles and estimate a joint model. In column (4), we further estimate the interactions between joint council and mayoral election years and explore effects of overlapping cycles. In column (5), we estimate the interaction of the incumbent dummy with the mayoral election dummies. Finally, we present the estimation results of the full model in column (6). Here, we estimate the effects of overlapping PBCs conditional on the incumbent's decision to re-run for office.

Council and mayor cycles

We find sizable and statistically significant election effects throughout all specifications only for the pre-election year in case of council elections. This holds true using the fixed effect OLS or the instrumental variables approach (see Tables 2 and 3).

The dependent variable is given as logarithm of municipal total expenditures (net of transfers), the coefficients must thus be interpreted as semi-elasticities. The estimated effect ranges between 1.3–1.8 percent of total expenditures (except for the result of column (6) in Table 3). For a town of 10.000 inhabitants this amounts to about 300.000 Euro in additional expenditures in the year prior to a council election. This pre-election effect for the council is robust to the inclusion of the mayoral cycle as well the various interaction effects.

For mayoral elections, we do not find evidence for a robust individual cycle in total expenditures. While we do find evidence for unconditional post-election year cycles in mayoral elections (column (2) and (3) in Tables 2 and 3), this effect disappears when further interaction effects are included. Remaining point estimates for the election dummies in case of mayoral elections are quite small and statistically insignificant.

Overlapping cycles and incumbent effects

We find heterogeneous evidence in case of overlapping cycles (column 4). While neither point estimates nor F-tests on joint significance point to cycles in cases of pre-election and election years, post-election years are the exception. Here, municipal expenditures seem to increase

[31] Interestingly, neither the ideology proxies nor the full-time mayor dummy and the mayor's age enter the model with statistically significant effects. While increasing population has a concave effect on local expenditures, the shares of young and old people do not affect spending. The estimation results for the control variables of the instrumental variables regression are available upon request.

in the year after simultaneous elections in both political branches. The mayor post-election coefficients are 0.014** (p-value 0.041, fixed effects OLS regression) and 0.015** (p-value 0.035, instrumental variables regression). This points to a potential collusion between both political branches in order to gain an electoral advantage.

However, the underlying channel though remains unclear in these estimations. We therefore extend the model and include information on whether the incumbent mayor seeks re-election in this municipality in order to explore one potential mechanism behind this result. Therefore, in columns (5) and (6) of either table we augment the model by interactions of a dummy including information whether or not the incumbent mayor seeks for re-election with the cycle variables.

The fact whether the incumbent re-runs for office exhibits a statistically significant and positive unconditional impact on municipal expenditures in case of the fixed effects OLS regressions (see Table 2). However, this result is not confirmed by the instrumental variables approach (Table 3). While point estimates increase in case of the instrumental variables regression, coefficients become marginally insignificant. Nonetheless, the results indicate unconditional higher spending in election periods in which the incumbent is seeking re-election.

To asses the quantitative and qualitative results of columns (5) and (6) in case of multiple interaction terms, we refer to Table 4 which contrasts the results for both columns in case of the fixed effects OLS and the instrumental variables regression. Note that Table 4 reports p-values of underlying F-tests in parantheses. The structure of the table is as follows: while distinguishing between pre-election, election, and post-election years, we compute marginal effects for overlapping council and mayoral elections conditional on whether the incumbent mayor runs for re-election. We then test whether the difference between these effects is statistically different from zero. Furthermore, we compute the marginal incumbent effect conditional on whether there is a simultaneous election. This effect can then be contrasted to the unconditional effects shown in the two baseline tables.

We find a sizable and statistically significant difference in pre-election years for mayors conditional on whether the incumbent re-runs for office (line *Difference D-C*). If the mayor does not run for re-election, local expenditures decrease in the year before the mayoral election. In contrast, if the mayor re-runs, the change in expenditures turns positive with a maximum difference of 5.5 percent (column 4). Furthermore, we find a sizable and significant incumbent effect in the range of 3.2 – 3.8 percent (line *E*) if the mayor re-runs conditional on joint council and mayoral elections in the next year. Note that this effect is much higher than the unconditional point estimates presented in Tables 2 and 3.

As indicated before, results are heterogeneous with respect to the timing of elections. In case of election years, we only find a statistically significant difference for the council but not for mayors. More precisely, if a council election takes place and there is a mayoral

Table 2: PBCs in public expenditure (fixed effects OLS regression)

	Dependent variable: total expenditures in logs (net of transfers)					
	(1)	(2)	(3)	(4)	(5)	(6)
Council elections						
Pre-election year	0.015**		0.013**	0.014**	0.014**	0.018*
	[2.398]		[2.090]	[2.141]	[2.246]	[1.691]
Election year	0.002		-0.002	0.000	-0.002	-0.003
	[0.257]		[-0.296]	[0.037]	[-0.251]	[-0.268]
Post-election year	0.005		0.000	-0.004	0.000	-0.007
	[0.996]		[0.011]	[-0.547]	[0.088]	[-0.672]
Mayor elections						
Pre-election year		0.003	0.001	0.002	-0.018***	-0.003
		[0.876]	[0.193]	[0.462]	[-2.590]	[-0.310]
Election year		0.006	0.006	0.007	-0.007	0.009
		[1.442]	[1.511]	[1.310]	[-0.865]	[0.804]
Post-election year		0.009***	0.009**	0.006	-0.005	-0.009
		[2.612]	[2.420]	[1.251]	[-0.626]	[-0.775]
Mayor elections × council elections						
Joint pre-election year				-0.005		-0.023
				[-0.518]		[-1.344]
Joint election year				-0.004		-0.022
				[-0.452]		[-1.370]
Joint post-election year				0.008		0.012
				[0.865]		[0.775]
Mayor elections × incumbent runs again						
Pre-election year					0.024***	0.007
					[3.209]	[0.627]
Election year					0.017*	-0.005
					[1.763]	[-0.344]
Post-election year					0.019*	0.020
					[1.940]	[1.505]
Council elections × incumbent runs again						
Pre-election year						-0.003
						[-0.263]
Election year						0.005
						[0.493]
Post-election year						0.005
						[0.508]
Joint elections × incumbent runs again						
Pre-election years						0.024
						[1.301]
Election years						0.025
						[1.410]
Post-election years						-0.006
						[-0.388]
Incumbent runs again dummy	0.013***	0.013***	0.013***	0.013***	0.004	0.004
	[2.940]	[3.053]	[3.050]	[3.043]	[0.718]	[0.631]
Control variables	✓	✓	✓	✓	✓	✓
Observations	39554	39554	39554	39554	39554	39554
R^2	0.077	0.077	0.077	0.077	0.077	0.077
Cluster	3017	3017	3017	3017	3017	3017

Notes: All specifications include municipality and time fixed effects. Robust t-values are shown in brackets. ***, (**), (*) denotes significance at the 1-, (5-), (10-)%-level. Error terms are clustered on the municipal level. Interaction effects for election dummies are estimated only for congruent election years. F-Tests for the interaction effects in columns (5) and (6) are shown in Table 4. The estimation also includes a number of additional control variables, see full list in Table A.4 in the appendix. Source: Own calculations.

Table 3: PBCs in public expenditure (instrumental variables regression)

	Dependent variable: total expenditures in logs (net of transfers)					
	(1)	(2)	(3)	(4)	(5)	(6)
Council elections						
Pre-election year	0.016**		0.014**	0.015**	0.015**	0.044**
	[2.477]		[2.194]	[2.266]	[2.293]	[2.103]
Election year	0.002		-0.001	0.001	-0.001	0.012
	[0.282]		[-0.140]	[0.138]	[-0.125]	[0.639]
Post-election year	0.005		-0.001	-0.004	-0.000	-0.003
	[0.918]		[-0.145]	[-0.655]	[-0.002]	[-0.216]
Mayor elections						
Pre-election year		0.003	0.000	0.002	-0.017	0.000
		[0.786]	[0.066]	[0.401]	[-1.459]	[0.017]
Election year		0.004	0.005	0.006	0.003	0.036*
		[1.126]	[1.129]	[0.978]	[0.181]	[1.726]
Post-election year		0.010***	0.010**	0.007	0.033	-0.003
		[2.641]	[2.475]	[1.310]	[1.330]	[-0.138]
Mayor elections × council elections						
Joint pre-election year				-0.005		-0.049*
				[-0.568]		[-1.650]
Joint election year				-0.004		-0.046*
				[-0.375]		[-1.854]
Joint post-election year				0.008		0.068**
				[0.855]		[2.480]
Mayor elections × incumbent runs again						
Pre-election year					0.020	0.001
					[1.511]	[0.065]
Election year					0.002	-0.041
					[0.084]	[-1.599]
Post-election year					-0.033	0.013
					[-1.036]	[0.491]
Council elections × incumbent runs again						
Pre-election year						-0.034
						[-1.413]
Election year						-0.013
						[-0.611]
Post-election year						-0.001
						[-0.042]
Joint elections × incumbent runs again						
Pre-election years						0.054
						[1.547]
Election years						0.057**
						[1.985]
Post-election years						-0.080**
						[-2.293]
Incumbent runs again dummy	0.015	0.017	0.017	0.017	0.012	0.017
	[1.489]	[1.635]	[1.617]	[1.613]	[0.791]	[1.111]
Control variables	✓	✓	✓	✓	✓	✓
Observations	39344	39344	39344	39344	39344	39344
R^2	0.077	0.077	0.077	0.077	0.076	0.075
Cluster	2997	2997	2997	2997	2997	2997
Underidentification test (Kleibergen-Paap rk LM)	888.7	865.4	864.3	863.4	833.2	674.8
Weak identification test (Kleibergen-Paap rk Wald F)	1066.3	1024.9	1023.0	1021.0	150.4	49.2
Overidentification test (Hansen J p-value)	0.824	0.851	0.850	0.848	0.977	0.755

Notes: The instrumented variable is the incumbent runs again dummy. Instruments are a dummy indicating whether the mayor is pensionable, a dummy indicating whether the mayor is older than 60 years, and the interactions of the instruments with the election indicators (if used in the regression, see the results of the first stage regression in Table A.5 in the appendix). All specifications include municipality and time fixed effects. Robust t-values are shown in brackets. ***, (**), (*) denotes significance at the 1-, (5-), (10-)%-level. Error terms are clustered on the municipal level. Interaction effects for election dummies are estimated only for congruent election years. F-Tests for the interaction effects in columns (5) and (6) are shown in Table 4. The estimation includes the full set of additional control variables (the results are available upon request). Source: Own calculations.

Table 4: Marginal effects of interaction terms: Fixed effects OLS regression vs. instrumental variables regression

	Fixed effects OLS		Instrumental variables	
	(1)	(2)	(3)	(4)
Pre-election year				
A: Council | joint pre-election years, incumbent runs again = 0		-0.005		-0.005
		(0.695)		(0.814)
B: Council | joint pre-election years, incumbent runs again = 1		0.016		0.015
		(0.115)		(0.167)
Difference if incumbent reruns (B-A)		0.021		0.020
		(0.138)		(0.424)
C: Mayor | joint pre-election years, incumbent runs again = 0	-0.018***	-0.026**	-0.017	-0.049**
	(0.010)	(0.034)	(0.145)	(0.033)
D: Mayor | joint pre-election years, incumbent runs again = 1	0.006	0.005	0.003	0.006
	(0.155)	(0.559)	(0.431)	(0.475)
Difference if incumbent reruns (D-C)	0.024***	0.031**	0.020	0.055**
	(0.001)	(0.015)	(0.131)	(0.039)
E: Incumbent runs again | joint pre-election years	0.028***	0.032***	0.032*	0.038**
	(0.001)	(0.001)	(0.067)	(0.045)
Election year				
F: Council | joint election years, incumbent runs again = 0		-0.025*		-0.034*
		(0.057)		(0.063)
G: Council | joint election years, incumbent runs again = 1		0.005		0.010
		(0.631)		(0.353)
Difference if incumbent reruns (G-F)		0.030**		0.044**
		(0.039)		(0.047)
H: Mayor | joint election years, incumbent runs again = 0	-0.007	-0.013	0.003	-0.010
	(0.387)	(0.327)	(0.856)	(0.683)
I: Mayor | joint election years, incumbent runs again = 1	0.010	0.007	0.005	0.006
	(0.032)	(0.334)	(0.378)	(0.463)
Difference if incumbent reruns (H-I)	0.017*	0.020	0.002	0.016
	(0.078)	(0.150)	(0.933)	(0.564)
J: Incumbent runs again | joint election years	0.021***	0.029***	0.014	0.020
	(0.005)	(0.002)	(0.296)	(0.175)
Post-election year				
K: Council | joint post-election years, incumbent runs again = 0		0.005		0.065**
		(0.698)		(0.018)
L: Council | joint post-election years, incumbent runs again = 1		0.004		-0.016
		(0.684)		(0.202)
Difference if incumbent reruns (L-K)		-0.001		-0.081**
		(0.906)		(0.025)
M: Mayor | joint post-election years, incumbent runs again = 0	-0.005	0.003	0.033	0.065*
	(0.531)	(0.803)	(0.183)	(0.051)
N: Mayor | joint post-election years, incumbent runs again = 1	0.014***	0.017	0.000	-0.002
	(0.002)	(0.023)	(0.991)	(0.861)
Difference if incumbent reruns (N-M)	0.019*	0.014	-0.033	-0.067
	(0.052)	(0.296)	(0.300)	(0.111)
O: Incumbent runs again | joint post-election years	0.023***	0.023**	-0.021	-0.051
	(0.002)	(0.015)	(0.314)	(0.119)

Notes: The marginal effects are computed by using the coefficients of columns (5) and (6) of Table 2 and Table 3, respectively. Two-sided p-values are shown in parantheses. ***, (**), (*) denotes significance at the 1-, (5-), (10-)%-level. Error terms are clustered on the municipal level. Source: Own calculations.

election in the same year, expenditures are increased by 4.4 percent if the incumbent seeks re-election (line *Difference G-F*, column 4). While the fixed effects OLS regressions again indicate a significant impact of incumbency, the instrumental variables regressions do not confirm these results (line *J*).

The same pattern for the incumbent effect can be observed in post-election years. Here, the results from the fixed effects OLS regression are not confirmed by the instrumental variables approach (line *O*). A result that is obtained from the instrumental variables approach though is given by the difference for council elections conditional on the candidacy of incumbent mayors (line *Difference L-K*). If the mayor did not re-run in the simultaneous elections which took place in the previous year, expenditures are higher than if the mayor re-ran.

Taken together, municipal expenditures increase in joint pre-election and election years if the mayor runs for re-election and increase in joint post-election years if she did not. In case of the first two results, one might argue that these are expected as incentives for strategic spending and collusion with the council are highest if the incumbent seeks re-election. Furthermore, we observe the pattern that in these settings mayors not re-running for office usually decrease spending (e.g., line *C*). The third main result of a negative difference conditional on the candidacy of the incumbent mayor may be justified with shifts in budget over time rather than deficit spending. While incentives for strategic spending previous and contemporary to elections is highest, this may induce shifts of future expenditure to the present causing a decline in post-election expenditure. The observation of a positive and statistically significant council effect in post e-election years conditional on the incumbent not re-running for office (line *K*) may be explained by the new mayor colluding with the council to initiate investment projects promised throughout her election campaign.

6. Robustness checks

We carry out various sensitivity tests to check for the robustness of our findings (see Table 5). First, we include non-completed election periods in the estimation. These periods were excluded in the previous regressions as the timing of mayoral elections could be endogenous. Second, we exclude county-free cities from the estimation sample.[32] PBCs in these cities might differ from the full sample because elections are rather partisan than in smaller municipalities. Third, to check whether the results are affected by the clustering of the error terms, we alternatively cluster at the county level. Fourth, we re-estimate all specifications for data on gross expenditures, i.e., we add state transfers to municipal expenditures. This may provide further insights into the formation of PBCs as municipal spending may be co-financed by upper-level governmental tiers. Finally, we estimate our model using a single instrument rather than two and rely on the dummy indicating whether the mayor is

[32] There are 9 county-free cities in BW and 25 county-free cities in BAY.

older than 60 years in the year of the mayoral election. This is due to the Bavarian state regulation associated with pension eligibility, i.e., there might be a confounding effect as one condition to become pensionable in BAY is that the mayor has ran for re-election (but was not elected or refused to accept her election). Accordingly, a mayor could strategically decide to re-run in order to become pensionable although it is not her intention to take office after the election. However, the instrumental variables regression with only one instrument comes at the cost that we cannot test for overidentification anymore.

The robustness checks are carried out for columns (5) and (6) of Table 3. The results are reported in Table 5. The letters in italic font at the end of the lines correspond to the letters in Table 4. Only the main results of the previous findings are presented, i.e., we show the unconditional coefficient for council pre-election years, the incumbent effect conditional on joint pre-election years, and the difference in spending if the incumbent re-runs conditional on joint pre-election, election, and post-election years. The estimates include the full set of covariates. Again, p-values are shown in parentheses.

The results reveal that the previous findings are highly robust. Both, the economic and statistical significance of the unconditional council pre-election year effect and the conditional incumbent effect are confirmed. Furthermore, there are only minor changes with respect to the difference in joint pre-election, election, and post-election years conditional on whether the incumbent runs for re-election. While the algebraic sign and the point estimates only change slightly, the statistical significance is lost in council election years when we include non-completed election periods (column (2), line *G-F*) and in council post-election years when we carry out the regressions with only one instrument (column (4), line *L-K*).

Nonetheless, the main findings of our study still hold. There is an inversion in the effect for pre-election and election years compared to post-election years conditional on the incumbent's decision to re-run. Expenditures are higher in the year before the election and in the election year if the incumbent runs for re-election and cycles overlap, and are higher in post-election years if the incumbent did not run for re-election and elections did overlap.

Table 5: PBCs in public expenditure: sensitivity test (instrumental variables regression)

	With non-completed terms		Without county-free cities		Clustering on county level		Gross expenditures		Only one instrument	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Council pre-election year	0.014**	0.037*	0.015**	0.046**	0.015*	0.044**	0.023***	0.049**	0.014**	0.042**
	(0.020)	(0.053)	(0.019)	(0.033)	(0.062)	(0.024)	(0.000)	(0.015)	(0.024)	(0.050)
Incumbent effect | joint pre-election years (*E*)	0.028*	0.038**	0.033*	0.038*	0.032*	0.038**	0.035**	0.039**	0.036*	0.041*
	(0.083)	(0.042)	(0.066)	(0.052)	(0.064)	(0.049)	(0.028)	(0.028)	(0.073)	(0.066)
Difference if incumbent reruns given joint elections										
Mayoral pre-election year (*D*-*C*)	0.016	0.050*	0.021	0.056**	0.020	0.055**	0.023*	0.056**	0.022	0.057**
	(0.199)	(0.051)	(0.129)	(0.040)	(0.207)	(0.033)	(0.061)	(0.028)	(0.114)	(0.039)
Council election year (*G*-*F*)		0.033		0.049**		0.044**		0.036*		0.046*
		(0.167)		(0.036)		(0.035)		(0.083)		(0.051)
Council post-election year (*L*-*K*)		-0.069*		-0.076**		-0.081**		-0.067**		-0.054
		(0.052)		(0.036)		(0.026)		(0.040)		(0.370)
Covariates included	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	41354	41354	38861	38861	39344	39344	39344	39344	39425	39425
R^2	0.079	0.078	0.076	0.075	0.076	0.075	0.080	0.079	0.076	0.076
Cluster	3011	3011	2963	2963	140	140	2997	2997	2997	2997
Underidentification test (Kleibergen-Paap)	870.0	729.8	814.3	673.8	92.2	89.9	833.2	674.8	303.6	187.8
Weak identification test (Kleibergen-Paap)	158.8	53.2	146.2	49.7	92.9	43.9	150.4	49.3	89.9	22.3
Overidentification test (Hansen)	0.957	0.742	0.963	0.748	0.976	0.601	0.982	0.627	-	-

Notes: The letters in italic font refer to the corresponding letters in Table 4. The sensitivity analysis is done for columns (5) and (6) of Table 3. In columns (1) and (2), we have included non-completed election periods in our regression. In columns (3) and (4), county-free cities are excluded from the estimation sample. In columns (5) and (6), we cluster the error term on the county level instead of the municipal level. In columns (7) and (8), we replace the dependent variable with the log of municipal gross expenditures, i.e., we add state transfers. Finally, in columns (9) and (10), we only use the dummy indicating whether the mayor is older than 60 years in the mayoral election year (and the interactions of the instrument with the election indicators) as instrument for the instrumental variables regression. Two-sided p-values are shown in parantheses. ***, (**), (*) denotes significance at the 1-, (5-), (10-)%-level. Source: Own calculations.

7. Conclusion

In this paper, we study PBCs in expenditures with a particular focus on overlapping cycles in the executive and the legislative branch of local governments. As the literature on PBC usually cannot separate effects for these two political spheres, this is a distinct feature of our study. Furthermore, we directly account for the potential endogeneity of the incumbent's decision to re-run for office and how this decision affects spending in times of elections. The testing ground is given by German local elections for mayors and municipal councils in the two southern states of *Bavaria* (BAY) and *Baden-Wuerttemberg* (BW). For both states, we observe the universe of all municipalities during the period from 1992-2006.

Our main findings can be summarised as follows: 1) We find sizable and statistically significant unconditional pre-election effects for council elections. Total expenditures are increased between 1.3–1.8 percent in the year before the council election takes place. 2) These budget cycle effects for the legislative branch (council) are robust to the inclusion of election variables for the executive branch (mayor). 3) We find no average unconditional (pre-)election PBC for the mayoral elections. 4) This also holds for the interaction effects when we condition on whether the incumbent mayor runs for re-election. However, if we look at differences for the incumbent effect, 5) we find increased spending in pre-election years if the incumbent re-runs. Finally, 6) we find insightful differences for overlapping cycles conditional on the incumbent's decision to re-run for office. Municipal expenditures increase in joint pre-election and election years if the mayor runs for re-election and decrease in joint post-election years if she did not. These results are all confirmed by estimations using an instrumental variables approach for the potentially endogenous decision of the incumbent to seek re-election.

Our results support the following conclusion: First, joint elections of councils and mayors seem to matter for the formation of PBCs. Separating the local elections can thus lower politically motivated distortions of expenditures before elections. Second, our findings for increased spending before mayoral elections when the incumbent mayor re-runs may justify age and term limits. In BAY and BW, we have (in)direct age limits but no term limit restrictions. Abolishing the age limits would likely increase the number of incumbent candidates re-running and introducing term limits would act in the opposite direction. Nonetheless, we would refrain from drawing direct inferences from our results. On the one hand, strong age and term limit rules could be viewed as limiting overspending before joint mayoral and council elections. In contrast, however, the mayor's incentive to manipulate the single election where she could be re-elected (for instance, if we assume a two-term limit) should even increase. It is thus not obvious whether the introduction of term limits would decrease or increase the overall effect of strategic spending in the long run. This question is thus open for further research.

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A. Appendix

Table A.1: Studies on political budget cycles in expenditures for sub-national levels of government

Study	Dependent variable	Main results	Country	Level of government	Political institution	Variation elections
Aidt et al. (2011)	Deviation from term-mean of investment expenditure, total expenditure, current expenditure and capital expenditure in years of election; as well as their absolute values	Lower average expenditures during the term lead to higher opportunistic deviations in election years, effect intensified with decreasing vote-margins; In case of absolute values, expenditure in election years depends positively on those in pre-election years	Portugal	Municipal	Combined local elections	Time variation
Akhmedov and Zhuravskaya (2004)	Total expenditure, composition of expenditure, growth, inflation	Increased expenditure, expenditure shifts to visible expenditures 1-2 months before elections, magnitude of effects decrease with increasing institutional quality	Russia	Regional	Regional governor elections	Time variation
Alt and Rose (2009)	Total expenditure	Increased expenditure, cycles intensified in case of medium approval ratings for the incumbent, unified government, low level of transparency, low level of media penetration, lacking fiscal rules	USA	State	Gubernatorial elections	Time variation
Baleiras and da Silva Costa (2004)	Investment expenditure	Increased expenditure in pre-election years	Portugal	Municipal	Combined local elections	Time variation
Blais and Nadeau (1992)	Total expenditure, surplus/deficit, composition of expenditure	Increased total expenditure in election years, expenditure shifted to social services and roads, increased deficits in election years	Canada	Provincial	Provincial elections	Time variation
Benito et al. (2013)	Budget deficits, capital spending, revenues	Slight reduction or no change in deficits, stronger reduction if fiscal rule prevalent, increase in revenues before and after elections, increase in expenditure only in year before elections, reduction in expenditure if fiscal rule is prevalent	Spain	Municipal	Municipal legislative elections	Time variation
Binet and Pentecôte (2004)	Per capita tax revenue, per capita capital expenditure, per capita loans	Decreased tax revenues, increased capital expenditures, increased loans in pre-election years	France	Municipal	Municipal council elections	Time variation
Cioffi et al. (2012)	Per capita total expenditure, per capita capital expenditure	Expenditures increase during the years of the election and pre-election years. Cycles are more pronounced if the mayor is not affiliated to a national party.	Italy	Municipal	Municipal council elections	Time variation
Drazen and Eslava (2010)	Composition of expenditure	Expenditure shifted to more targeted categories such as health, infrastructure spending or housing	Colombia	Municipal	Mayor and city-council	Time variation

Continued on next page.

Table A.1: continued

Study	Dependent variable	Main results	Country	Level of government	Political institution	Variation elections
Foucault et al. (2008)	Primary expenditure, operating expenditure, payroll expenditure, investment	Increased expenditures in all types tested in year before election, expenditures decrease in year after the election, effects strongest for investment expenditure	France	Municipal	Municipal council elections	Time variation
Galli and Rossi (2002)	Total expenditure, surplus/deficit, composition of expenditure	Increased expenditure, increased deficits in election years, no clear shifts in expenditure, no ideological cycles	Germany	State	State elections	Time variation
Khemani (2004)	Tax revenues, own revenues, various expenditure categories, budget deficit	No effect of fiscal expansions on overall spending and budget deficits but small manipulation of targeted expenditures, i.e., there is higher investment spending while spending in populist regarded categories is lower. Furthermore, there is lower tax collection for specific producer groups	India	State	State elections	Time variation
Kneebone and Mckenzie (2001)	Primary deficit, total expenditure, revenue, composition of exp.	Increased expenditure, increased deficits in election years, expenditure shifted to schools (effects depend on ideology)	Canada	Provincial	Provincial elections	Time variation
Rose (2006)	Budget deficits, total expenditure, revenues	Deficit increases in election year, weaker increase if fiscal rules prevalent, taxes unaffected, expenditures increase in election years, increase stronger under unified government, effects weakened if fiscal rule is prevalent	USA	State	Gubernatorial elections	Time variation
Rosenberg (1992)	Development expenditures	Increased expenditure in election years, effect intensified if incumbent does not re–run	Israel	City	City-council elections	Between variation
Schneider (2010)	Deficit, total expenditure, composition of expenditure	Decline in deficits, no changes in expenditure, composition of expenditure, expenditure shifted to social security	Germany	State	State elections	Time variation
Seitz (2000)	Total expenditure, composition of expenditure, primary deficit, (tax-)revenues	No partisan impact on total expenditure and its components	Germany	State	State elections	Time variation
Veiga and Veiga (2007b)	Budget balance, taxes, total expenditure, composition of expenditure	Increased deficits, reduced taxes, increased total expenditures in election years, effects intensified for left-wing mayors	Portugal	Municipal	Combined local elections	Time variation

Notes: The summary comprises studies that are either published in refereed journals or as working papers. All papers are cited in our references.

Table A.2: Variable description

Variable	Description	Source
Total expenditures in logs (net of transfers)	Logarithm of total municipal expenditures minus state transfers.	Jahresrechnungsstatistik
Dummy pre-election year	Dummy = 1 if there is a council election, state election, or mayor election in the following year; zero otherwise.	Statistical office (BAY), Questionaire, internet research (BW)
Dummy election year	Dummy = 1 if there is a council election, state election, or mayor election in the current year; zero otherwise.	Statistical office (BAY), Questionaire, internet research (BW)
Dummy post-election year	Dummy = 1 if there is a council election, state election, or mayor election in the preceding year; zero otherwise.	Statistical office (BAY), Questionaire, internet research (BW)
Dummy incumbent runs again	Dummy = 1 if the incumbent mayor runs for re-election; zero otherwise. The variable is equal to one/zero for the whole election period.	Statistical office (BAY), Questionaire, internet research (BW)
Dummy full time mayor	Dummy = 1 if the mayor is working as a full time mayor; zero otherwise.	Statistical office (BAY), Questionaire, internet research (BW)
Dummy left mayor	Dummy = 1 if the mayor is member of the Social Democrats (SPD) or the Green party (Grüne); zero otherwise.	Statistical office (BAY), Internet research (BW)
Dummy mayor is pensionable	Dummy = 1 if the mayor is eligible to receive pensions; zero otherwise. The variable is equal to one/zero for the whole election period.	Own computation based on state regulations
Dummy mayor is older than 60 years	Dummy = 1 if the mayor is 60 years old or older in the elecion year; zero otherwise. The variable is equal to one/zero for the whole election period.	Own computation
Age of the mayor	Age of the mayor in years.	Statistical office (BAY), Internet research (BW)
Share left parties in council	Number of seats of the Social Democrats (SPD) and the Green party (Grüne) divided by the total number of seats.	Statistical offices (BAY and BW)
Population (per thousand)	Municipal population divided by 1,000.	Statistical offices (BAY and BW)
Population (per thousand) squared	Squared population (per thousand).	Statistical offices (BAY and BW)
Share population < 15 years	Number of inhabitants younger than 15 years divided by total population.	Statistical offices (BAY and BW)
Share population ≥ 65 years	Number of inhabitants older than 65 years divided by total population.	Statistical offices (BAY and BW)

Table A.3: Sample selection comparison for BW

	Full Sample		Estimation Sample		t-test mean comparison
	No/Mean	S.D.	No/Mean	S.D.	Hypothesis: Difference $\neq 0$
Number of municipalities	1101	-	968	-	-
Municipal-year observations	16515	-	10531	-	-
Log total exp. (net of transfers)	15.964	1.182	16.116	1.143	$\Pr(\|T\| > \|t\|) = 0.0000$
Population (per thousands)	9.481	25.54	10.800	28.19	$\Pr(\|T\| > \|t\|) = 0.0001$
Population share < 15	0.182	0.024	0.180	0.024	$\Pr(\|T\| > \|t\|) = 0.0000$
Population share > 65	0.151	0.029	0.155	0.029	$\Pr(\|T\| > \|t\|) = 0.0000$

Notes: We test against the null hypothesis that the difference in means is equal to zero, i.e., H0: mean(full sample) - mean(estimation sample) = 0. The p-values show that the difference is not equal to zero.

Table A.4: PBCs in public expenditure: Control variables for Table 2

	Dependent variable: total expenditures in logs (net of transfers)					
	(1)	(2)	(3)	(4)	(5)	(6)
Share left parties in council	0.024	0.024	0.023	0.023	0.023	0.023
	[0.571]	[0.580]	[0.554]	[0.554]	[0.555]	[0.552]
Dummy left mayor	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
	[-0.774]	[-0.771]	[-0.766]	[-0.765]	[-0.762]	[-0.754]
Dummy full time mayor	0.012	0.012	0.012	0.012	0.012	0.012
	[0.815]	[0.797]	[0.807]	[0.805]	[0.809]	[0.800]
Age of the mayor	0.000	0.000	0.000	0.000	0.000	0.000
	[0.700]	[0.863]	[0.836]	[0.840]	[0.133]	[0.140]
State elections						
Pre-election year	-0.003	-0.004	-0.002	0.001	-0.002	0.000
	[-0.527]	[-1.066]	[-0.284]	[0.091]	[-0.341]	[0.048]
Election year	0.011**	0.003	0.010*	0.009*	0.010*	0.010*
	[2.088]	[1.075]	[1.799]	[1.746]	[1.856]	[1.854]
Post-election year	0.021***	0.024***	0.021***	0.023***	0.021***	0.023***
	[4.028]	[7.054]	[4.025]	[4.324]	[3.952]	[4.307]
Population	0.018***	0.018***	0.018***	0.018***	0.018***	0.018***
	[3.377]	[3.418]	[3.402]	[3.409]	[3.404]	[3.407]
Population squared	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***
	[-2.993]	[-3.037]	[-3.029]	[-3.037]	[-3.014]	[-3.029]
Share population $<$ 15 years	0.288	0.293	0.288	0.288	0.290	0.292
	[1.156]	[1.177]	[1.155]	[1.158]	[1.164]	[1.171]
Share population $>$ 65 years	0.131	0.181	0.142	0.151	0.151	0.160
	[0.737]	[1.096]	[0.792]	[0.831]	[0.842]	[0.878]
Trend BAY	0.029***	0.020***	0.030***	0.030***	0.030***	0.030***
	[14.338]	[9.572]	[14.364]	[14.358]	[14.421]	[14.407]
Trend BAY squared	-0.001***	-0.000***	-0.001***	-0.001***	-0.001***	-0.001***
	[-5.980]	[-2.977]	[-6.018]	[-6.015]	[-6.079]	[-6.077]
Trend BW	0.036***	0.025***	0.036***	0.036***	0.036***	0.036***
	[13.353]	[9.853]	[13.396]	[13.344]	[13.352]	[13.345]
Trend BW squared	-0.001***	-0.000*	-0.001***	-0.001***	-0.001***	-0.001***
	[-5.836]	[-1.762]	[-5.912]	[-5.888]	[-5.923]	[-5.923]
Constant	15.153***	15.141***	15.147***	15.146***	15.165***	15.163***
	[226.984]	[229.019]	[225.610]	[224.519]	[219.643]	[218.392]
Observations	39554	39554	39554	39554	39554	39554
R^2	0.077	0.077	0.077	0.077	0.077	0.077
Cluster	3017	3017	3017	3017	3017	3017

Notes: All specifications include municipality and time fixed effects. Robust t-values are shown in brackets. ***, (**), (*) denotes significance at the 1-, (5-), (10-)%-level. Error terms are clustered on the municipal level.

Table A.5: PBCs in public expenditure: First stage regression of Table 3

	Dependent variable: Dummy = 1 if the incumbent runs for re-election					
	(1)	(2)	(3)	(4)	(5)	(6)
Instrument 1: Dummy mayor is pensionable	-0.196***	-0.194***	-0.193***	-0.193***	-0.260***	-0.275***
	[-15.249]	[-15.016]	[-14.993]	[-14.976]	[-17.160]	[-17.086]
Instrument 2: Dummy mayor is older than 60 years	-0.358***	-0.354***	-0.354***	-0.354***	-0.421***	-0.393***
	[-26.568]	[-26.258]	[-26.243]	[-26.240]	[-25.577]	[-22.991]
Council elections						
Pre-election year	0.011		0.021**	0.001	0.029***	-0.014
	[1.113]		[2.064]	[0.114]	[3.319]	[-0.963]
Election year	0.001		0.034***	-0.006	0.043***	-0.026**
	[0.103]		[3.851]	[-0.509]	[5.554]	[-2.121]
Post-election year	0.015**		0.041***	-0.001	0.064***	-0.004
	[2.030]		[4.189]	[-0.122]	[6.973]	[-0.429]
Mayor elections						
Pre-election year		0.006	-0.000	-0.011	-0.020***	-0.047***
		[1.213]	[-0.076]	[-1.626]	[-3.821]	[-5.839]
Election year		-0.054***	-0.061***	-0.096***	-0.077***	-0.138***
		[-8.369]	[-8.696]	[-9.124]	[-9.824]	[-10.386]
Post-election year		-0.042***	-0.054***	-0.089***	-0.416***	-0.585***
		[-4.617]	[-5.129]	[-5.916]	[-32.439]	[-25.287]
Mayor elections × council elections						
Joint pre-election year				0.031*		0.067***
				[1.788]		[3.136]
Joint election year				0.092***		0.153***
				[4.825]		[7.017]
Joint post-election year				0.101***		0.287***
				[4.378]		[10.770]
Mayor elections × instrument 1						
Pre-election year					0.022***	0.091***
					[2.917]	[6.168]
Election year					0.039***	0.154***
					[3.603]	[7.258]
Post-election year					0.480***	0.695***
					[26.536]	[25.584]
Mayor elections × instrument 2						
Pre-election year					0.016*	-0.076***
					[1.912]	[-3.157]
Election year					-0.020	-0.216***
					[-1.544]	[-7.094]
Post-election year					0.465***	0.489***
					[23.333]	[15.409]
Council elections × instrument 1						
Pre-election year						0.086***
						[5.415]
Election year						0.090***
						[6.103]
Post-election year						0.081***
						[5.886]
Council elections × instrument 2						
Pre-election year						-0.102***
						[-3.958]
Election year						-0.152***
						[-6.230]
Post-election year						-0.148***
						[-6.689]
Joint elections × instrument 1						
Pre-election years						-0.182***
						[-5.700]
Election years						-0.256***
						[-7.422]
Post-election years						-0.375***
						[-12.668]
Joint elections × instrument 2						
Pre-election years						0.215***
						[4.644]
Election years						0.385***
						[8.401]
Post-election years						0.136***
						[4.330]
Control variables	✓	✓	✓	✓	✓	✓
Observations	39363	39363	39363	39363	39363	39363
R^2	0.220	0.222	0.222	0.223	0.335	0.343

Notes: All specifications include municipality and time fixed effects. Robust t-values are shown in brackets. ***, (**), (*) denotes significance at the 1-, (5-), (10-)%-level. Error terms are clustered on the municipal level. The estimation includes the full set of additional control variables. Source: Own calculations.