The mayor's advantage: Causal evidence on incumbency effects in German mayoral elections

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ABSTRACT

This paper provides empirical evidence on the party incumbency advantage in mayoral elections in Germany. Using a regression discontinuity design on a data set of about 25,000 elections, I estimate a causal incumbency effect of 38–40 percentage points in the probability of winning the next election. Studying the mechanisms behind this effect, I show that the electoral advantage is larger for full-time mayors, increasing in municipality size, independent of the specific partisanship of the mayor and constant between 1945 and 2010. Moreover, it increases with local spending hikes and it is independent of municipal debt.

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1. Introduction

A central feature in most democracies is that the citizens elect members of a party into political positions. It is well known that these incumbents in the political office receive an incumbency advantage in future elections for the same office. Theorists in political science and political economics have long recognized the specific role of incumbents (see, e.g., Besley and Case, 1995; Alesina and Rosenthal, 1995; Persson and Tabellini, 2000). Models of political accountability and political agency are often centered on the behavior of incumbent politicians (see Rogoff and Sibert, 1988; Besley and Case, 1995; Persson et al., 1997). In political science, the question of why incumbents are so hard to beat, has received much attention from leading scholars (see Cover, 1977; Payne, 1980; Krehbiel and Wright, 1983; Gelman and King, 1990; King and Gelman, 1991).

Starting with Erikson (1971), a large strand of empirical literature highlights the issue of incumbency and the intrinsic advantage that parties and candidates derive from holding a political office during reelection campaigns.[1] Much of the focus has been on the case of the U.S., and only in recent years have scholars also started to document the effects outside of the United States (see Miguel and Zahidi, 2004; Uppal, 2009; Hainmueller and Kern, 2008; Ade et al., 2014). This paper investigates the electoral advantage for the party of incumbent mayors in German municipalities.

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[1] Also see among others Jacobson (1987), Levitt and Wolfram (1997), Ansolabehere et al. (2000), Cox and Katz (2002), Ansolabehere and Snyder (2004), Ansolabehere et al. (2006) and Stratmann (2013).

While the literature on incumbency effects recognizes the electoral advantage as a well established fact[2], we have less of an understanding of the determinants that lead to this intrinsic advantage. Several causes, however, have been identified and empirically tested such as: access to resources, increased media presence, name recognition, redistricting, strategic entry and exit, political benefits from economic prosperity, the role of advertisement and campaign spending, legal restrictions to campaign contributions, ballot access, political parties in power and secured pork-barrel spending in the incumbent's district.[3] Along those lines, the contribution of this current paper is that I can study the causal incumbency advantage in a whole array of subgroups (see below).

For the main analysis, I have built a new data set that comprises more than 25,000 independent mayoral elections in the state of Bavaria over the period from 1945–2010. Estimation results from a regression discontinuity design (RDD) show a party incumbency effect in the order of 38–40 percentage points in increasing the probability of winning the next election. The results remain stable over a range of different specifications and a number of tests validate the credibility of the research design.

Lee (2008) was the first to examine the empirical facts of the incumbency phenomenon by applying a regression discontinuity design in which close elections provide the source of exogenous variation. He investigates elections for the US House of Representatives and analyzes the effect of party incumbency on the probability of winning the subsequent election. Lee estimates the intrinsic electoral advantage to be around 45 percentage points in the probability of winning the seat.

Following Lee's analysis, a number of studies use similar designs to estimate the incumbency advantage of parties in different settings. Ferreira and Gyourko (2009) study the effects of incumbency in mayoral elections in the United States, finding an incumbency effect of about 32 percentage points for the probability of reelection.[4] For Germany, Hainmueller and Kern (2005) investigate the party incumbency advantage within districts for federal elections and Ade et al. (2014) show that a positive incumbency advantage also exists in German state elections.

As mentioned above, the empirical analysis in this paper also sheds further light on the mechanisms that make up the incumbency effect. Due to the exceptional richness of the data, I can explore the causal effect in a number of subgroups and analyze the heterogeneity in the average effect. The analysis distinguishes heterogeneity in three main dimensions: (1) the characteristics of the town, (2) the mayor's past performance in terms of local economic indicators and (3) the constitutional setting under which the mayor works.

Concerning the first, I find that the incumbency advantage is larger for towns that employ a full-time mayor and it is increasing in municipality size both of which indicates a role for the level of available resources. Moreover, I show that the effect is independent of the particular partisanship of the mayor that the town elected which highlights that the advantage is indeed universal. Finally, I can look at the electoral advantage in different periods in the observation span and find the effect to be constant over time.

For the second dimension, I use key economic variables to evaluate whether the voting decision on the incumbent mayor is contingent on past economic performance. In the analysis, I find that voters reward the incumbent mayor if spending increases over and above the general level, but they fail to punish if municipal debt levels increase.

In the third part of the heterogeneity analysis, I exploit the fact that mayors in Germany operate under different constitutional frameworks in different German states. To test whether those constitutional differences affect the size of the electoral advantage, I collected additional data for 5 further states and compare RDD estimates from these states to the results for Bavaria. Overall, I find no significant differences in the estimates from different states.

Methodologically, I rely on close elections to identify quasi-experimental variation in the partisanship of the mayor. The identifying assumption is that the precise election outcome is subject to a random component when the election is exceptionally close. As a result, treatment just above the defining threshold of 50% in vote share is assigned quasi-randomly. The party incumbency advantage effect is, then, consistently estimated from the regression discontinuity design, as the continuity assumption directly follows from local randomization. This identification strategy is used in a number of studies, not just to estimate the effect of incumbency, but also in other contexts.[5]

The paper is structured as follows. I describe the institutional background and the data set in Section 2. In Section 3, I lay out the empirical methodology. Section 4 discusses the main results and investigates the validity of the research design. Section 5 concludes the analysis.

2. Data and institutional setting

In Germany, the municipal level is the lowest of the four governmental tiers.[6] Local governments in Germany oversee local public firms, administrate mandated spending allocated by higher tiers and carry out a number of direct responsibilities such as child care provision, expenditures for culture and recreation as well as investments in local infrastructure. The average budget of a German municipality is about 1500 Euro per capita. In total, about $\frac{1}{3}$ of total government spending is allocated to the local level. The municipalities

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[2] Note that, in the context of developing countries the case might be different. Here, researchers actually find substantial negative effects of incumbency (see Linden (2004) and Uppal (2009) for India, Miguel and Zahidi (2004) for Ghana or Titiunik (2009) for Brazil).

[3] See King and Gelman (1991), Serra (1994), Cox and Katz (1996), Levitt and Wolfram (1997), Ansolabehere et al. (2000), Ansolabehere and Snyder (2004), Stratmann (2005, 2006, 2009), Folke (2010), Stratmann (2010), Strömberg and Snyder (2010), Houser et al. (2011), Fink (2012), Costas-Pérez et al. (2012), Ade et al. (2014) and Martins and Veiga (2014).

[4] See also the analysis by Folke and Snyder (2012), who investigate the incumbency advantage and its determinants for US governors.

[5] The idea was first used in parallel discussion papers, which came out in the year 2001, by Pettersson-Lidbom (2008), who evaluates the economic policy consequences of party block majorities in Swedish councils and by Lee (2008) (mentioned above). For further applications, see, e.g., Ferreira and Gyourko (2009), Gerber and Hopkins (2011) and Vogl (2014) on partisan effects of US mayors, Eggers and Hainmueller (2009) on financial benefits to MP's in Great Britain, Brollo and Nannicini (2012) on fiscal transfers in Brazil.

[6] Besides the federal level, Germany is organized in 16 states (of which 3 are city states), about 450 counties and about 12,500 municipalities.

also oversee about 40% of all government personnel. The affairs of the municipality are in the joint responsibility of the mayor and the municipal council.[7]

In this study, I mainly use data on mayors from the German state of Bavaria. Here, the mayor is granted a strong and independent position by the South German Council Constitution (*Süddeutsche Ratsverfassung*). The constitution puts the mayor in charge of the local administration, municipality personnel and all day-to-day decisions. In local politics, the mayor heads the city council (with active voting rights), presides over all council committees and sets the local policy agenda. In many municipalities, she is often the only full-time working politician. Despite this powerful position of the mayor, it should be noted that the council remains the legislative body for all municipal decisions.

Mayors are directly elected by the voters in majoritarian elections.[8] Mayors are elected for a period of 6 years and the election is typically simultaneous with the local city council election. If the first-ballot is indecisive (no candidate above 50%) the law requires a second, run-off, election in which the two leading candidates compete. The position of the mayor can be either full-time or part-time.[9]

In total, I observe the results of 25,180 elections since 1945 for 2056 municipalities.[10] More than 45% of all elections are single-candidate elections, while about 38% had 2 candidates, 11% had 3 candidates, 4% had 4 candidates, and less than 1% had 5 or more candidates. In the analysis, I use the observations of two parties: center-right (CSU — '*Christlich Soziale Union*')[11] and center-left (SPD — '*Sozialdemokratische Partei Deuschlands*'). Results of other parties are not considered in the analysis.[12] As the electoral rule in Bavaria allows for candidates to be supported by several parties, I recode joint nominations to be nominations of the party indicated to be the primary affiliation. Moreover, I use the result of the run-off election, if applicable.

A note of caution is in order to explain why I can use the information on two parties. An incumbency advantage highlights the electoral difference between the competitors and in a two-party system, there no such thing as a party-specific incumbency effect as the effects are mere images of each other (see Ade et al., 2014). Also, if the majority of the data had a competition just between two parties the effects would be very much inflicted. However, in Bavaria, we do not observe this to be the case. Not even 5% of the elections have a two-candidate setting in which the center-right and the center-left are directly competing.[13] If both the center-right and the center-left party field a candidate in a mayoral election, I will treat them as separate observations.[14] Overall, I use both parties jointly in the analysis, because this uses the given data information best and provides a more general illustration of incumbency effects in Bavaria.[15]

Table 1 illustrates the scope of the data set. In total, I have 18,761 observations for which I can link the outcome of a center-left or center-right candidate in $t-1$ to the outcome of this party in a subsequent mayoral election in t within the same municipality. As indicated in the table, about 2/3 of those observations come from the center-right party that participates most often in the local mayoral races. The table also presents the number of observations within subsamples restricted by the size of the margin of victory. To effectively exclude single-candidate elections, I restrict the general sample to be within the 60% winning margin.[16] Moreover, I highlight the number of observations in the samples within the 5%, 2% and 1% margins of victory.

In Table 2, I show descriptive statistics of the main variables used in the analysis. For the full sample, the average number of voters is 3454. Further, 45% of the elections in the data set have candidates competing for a full-time mayoral position. The vote share of the winner in $t-1$ is, by definition, restricted to be greater than 50% and is, on average, 72%. As outcome variables in t, I highlight the vote share of the center-left and center-right party respectively (conditional on participation in t and $t-1$). Panel 2 of Table 2 shows the descriptive figures for the number of voters and the distribution of the mayor status for the sample within the 5% margin. I find that observations for which the election was close in $t-1$ are slightly larger on average and had a larger share of full-time mayors.

To investigate interesting subsamples, I supplement the data with a number of additional variables on fiscal characteristics for the period 1983–2007. In particular, I collected yearly per capita data on total municipality expenditures, local public debt, revenue from local trade tax and an indicator of the tax power (defined as own revenue from local taxes divided by total revenue from all sources).

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[7] See Bundesbank (2000).

[8] Bavaria is in fact only one of two states in Germany (the other being Baden-Württemberg) where the mayor is directly elected since World War II. Most German states only instituted direct mayoral elections at the beginning of the 1990s.

[9] The current law prescribes that a municipality is to have a part-time mayor if it has 5000 or fewer residents, however communities may deviate from this rule. Communities with more than 5000 and 10,000 or fewer residents are expected to have a full-time employed mayor, however, deviations from this rule are allowed. Communities with more than 10,000 citizens are required to have a full-time mayor. In practice, all municipalities with at least 7500 inhabitants or more have full-time mayors.

[10] In Bavaria, there are 2056 municipalities as of 2008. Note that Bavaria saw changes in the municipality structure in the end of the 1960s and beginning of the 1970s.

[11] The CSU is an independent party existing only in Bavaria. At the federal level, the party forms a close alliance with the CDU ('*Christlich Demokratische Union*') and, effectively, acts as one party.

[12] The reason is twofold. For smaller parties, such as the Greens ('*Die Grünen*') or the liberal party (FDP — '*Freie Demokratische Partei*'), winning the mayor's office is very rare and those observations might be special in their own regards. In contrast, local independent parties are often very strong and regularly win mayor elections. However, the local party identity is often not fix over time and such party groups sometimes only form to support a specific candidate.

[13] What I observe is that in smaller towns it is often either the center-right or the center-left that competes with independent local parties. In larger towns it is than often the case that additional candidates from local parties are in the competition together with both the center-right and the center-left.

[14] As those observations might be subject to common shocks, I will cluster standard errors in the analysis at the level of each municipal election.

[15] As pointed out by a referee, the drawback is that it is not the way the literature (which had to focus on two-party systems mostly) has presented the incumbency advantage. To make sure that my results are not in any way manufactured by this assumption, I also reiterated the entire analysis and estimated the effects using only the individual parties. None of the conclusions change when this analysis is implemented (results not included but available upon request).

[16] Thus, in a two candidate election the winning candidate won with a maximum of 80% of the vote. In single-candidate elections, the participant runs against herself and usually receives 80–100% of all votes.

Table 1
Data set description.
Source: Own calculations, based on the data provided by the federal election office.

	All	Center-left	Center-right
Observations			
Total	18,761	6692	12,069
Within 60% margin	13,797	5525	8272
Within 5% margin	1231	817	414
Within 2% margin	487	314	173
Within 1% margin	220	142	78
Elected mayors		4006	9817

Center-left refers to the social-democrats (SPD) and center-right refers to the conservative Christian democrats (CDU).

3. Empirical model and methodology

In this section, I describe the empirical strategy pursued, which is based on a regression discontinuity design (RDD). The object of interest is the effect of party incumbency on subsequent mayoral election outcomes. I denote this treatment with the dummy variable $d_{i,t}^p$, where the superscript p refers to the party identity, i refers to the municipality and t denotes the election period. The treatment variable is uniquely determined by a score variable (also referred to as running variable), the margin of victory, $v_{i,t}^p$. The margin of victory (or loss) is defined as the distance in vote share of the party to the best opponent. If the margin of victory is positive in $t-1$, the party has its candidate in office during the election period t. I say, the party earned incumbency status during this election period.

$$d_{i,t}^p = 1\left[v_{i,t-1}^p > 0\right]. \tag{1}$$

I consider election outcomes from the subsequent mayoral elections within the municipality i as outcome variables and denote them as $y_{i,t}^p$. Note that the outcome is indexed with t, as the outcome will be measured at the end of election period t. As outcome variables, I consider an indicator variable that takes a value of one when the party wins office in t.

The problem of estimation is twofold. First, I am interested in obtaining consistent estimates for the causal effect of political incumbency of a party on future election outcomes. Second, I want to investigate the effect in various subgroups. For clarity, I will turn to each of these problems separately.

I follow Pettersson-Lidbom (2008) and Lee (2008)[17] in their use of RDD.[18] The basic model is given as follows:

$$y_{i,t}^p = \delta_0 + \delta_1 d_{i,t}^p + \epsilon_{i,t} \quad \text{for} \quad |v_{i,t-1}^p| < \Delta \tag{2}$$

where δ_1 is the parameter measuring the incumbency effect. In this limited sample model, the regression analysis is based only on observations within a small margin, Δ, from the threshold (which is at $v_0 = 0$). Alternatively, I also consider a control function approach as follows:

$$y_{i,t}^p = \delta_0 + \delta_1 d_{i,t}^p + h\left(v_{i,t-1}^p, \theta\right) + \epsilon_{i,t}. \tag{3}$$

Here, the analysis can rely on a larger set of observations. The flexible function $h(\cdot)$ then represents the conditional association between the margin of victory and the election outcome, y.

The intuition of the RDD is to focus on the observations just around the threshold and approximate the limits of the conditional mean function from above and below the threshold. Assuming that the margin of victory $v_{i,t-1}^p$ contains a random component and cannot be precisely manipulated by the parties, observations just right and left of this decisive threshold should have the same characteristics both observable and unobservable. The main argument for the validity of the RDD used here is that election results in German mayoral elections are sufficiently prone to random factors that can shift the election outcome within a small margin.[19] Such factors could be things that affect, for example, participation (like weather or simultaneously held higher level elections (see Knack, 1994)[20] or direct shocks in party popularity (e.g. media coverage of political scandals).

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[17] A similar framework is used by Hainmueller and Kern (2008) in the setting of German district candidates in federal election as well as by Ferreira and Gyourko (2009) for US mayors.

[18] The RDD intuition was first developed by Thistlethwaite and Campbell (1960) to test the effect of scholarships on subsequent educational attainment of college students. Hahn et al. (2001) clarified the conditions needed to estimate treatment effects from a RDD.

[19] The argument of randomness in elections is not just a point made by empiricists, also theoretical models in political economy often rely on a similar assumption. Lindbeck and Weibull (1987) introduced the thought of random chance in elections in their model of probabilistic voting which has come to be a standard model of voting theory.

[20] Participation shocks could shift election results especially when they apply to some groups of voters more than to others.

Table 2
Data set — descriptive statistics of the variables.
Source: Own calculations, based on the data provided by the federal election office.

Variable	Observations	Mean	Std. dev	Min	Max
Panel 1: Variables in the full sample					
Number of voters	18,761	3454.7	3689.3	20	38,461
Dummy for mayor status	18,625	0.45	0.50	0	1
Vote share of the winner	18,755	0.72	0.16	0.5001	1
Vote share of the center-right	10,073	0.64	0.24	0.004	1
Vote share of the center-left	4758	0.49	0.25	0.028	1
Panel 2: Variables in the 5% margin sample					
Number of voters	1231	4143.1	4581.3	166	36,876
Dummy for mayor status	1217	0.51	0.50	0	1

Notes: The table shows the descriptive statistics for the variables used in the analysis. The vote share of the winner refers to the election in $t - 1$. The vote shares of the center-right and the center-left party refer to the outcome of these parties in the election at t, conditional on participation in t and $t - 1$. Panel 2 highlights the descriptives for the number of voters and the dummy for the mayor status ($0 =$ part-time and $1 =$ full-time employed) within the sample of elections that was as close a 5% in the margin of victory (in $t - 1$).

The formal identifying assumption required for the RDD to hold is the continuity assumption (see Lee and Lemieux, 2009). Around the threshold, all characteristics, except treatment, must be distributed continuously for the identification to be valid. If no covariates besides treatment changed at the threshold, the effect of treatment on the outcome can be consistently estimated.

The limited sample approach, Eq. (2), makes direct use of this idea. Here I compare election outcomes only for the samples within a small margin from the threshold. In the analysis, I rely on a margin of 2% in the margin of victory. Hence, I compare treatment between observations in which a mayoral race was decided by no larger margin than a 51–49 split. To obtain a consistent estimate of the treatment effect, I must assume that the winner of such a close race was effectively randomly chosen.

By including the control function $h(\cdot)$, the RDD can maintain the same identifying assumption, but allow for estimation with the entire sample. Introducing a flexible functional form of the margin of victory in the full sample regression, any correlation of treatment with omitted variables in the error term can be controlled for. However, the additional assumption then is that the control function is correctly specified. In practice, I use various parametric polynomial specifications of different degrees to illustrate that the effects found are not relying on precise functional form assumptions.

Complementing the parametric approaches, I also implement non-parametric estimations. These models provide data-driven analysis on the basis of kernel weighted local linear regressions.[21] There is a large scientific debate on which optimal bandwidth to choose in those approaches. For the main results, I highlight a wide array of bandwidths and report both the Imbens and Kalyanaraman (2011) (IK) and the Calonico et al. (2015) (CCT) optimal bandwidth (see also Hyytinen et al., 2014).

It is important to note that I estimate the incumbency of parties and not of specific candidates. While it might at first appear to be more intuitive to study the incumbency effects of specific candidates that run for consecutive elections, such an analysis requires significantly more data and econometric modeling. For a detailed discussion of differences between the incumbency party estimator (as proposed by Lee, 2008), the incumbent advantage estimators by Gelman and King (1990) (also see Cox and Katz, 2002) as well as that by Ansolabehere et al., 2000 can be found in Caughey and Sekhon, 2011).

Due to the richness of the data, I can investigate the size of the incumbency party effect in various subgroups. To compare subgroup results, I split the sample and run separate regressions. In practice, the sample is divided into two distinct subsamples ($E = 0$ and $E = 1$) along a specific dimension. The dimensions considered are: status of the mayor (part-time or full-time employed), municipality size (above and equal 5000 voters or below), party identity of the mayor (center-left or center-right), time of the election (before or after 1980), the change of expenditure (high or low changes), the change of debt (high or low changes) and the change of the local tax base (high or low changes). For the fiscal data, I split the samples at the median of the distributions.[22] Finally, I can also run the RDD model for data from different German states. The separate regressions then read:

$$y_{i,t}^p = \gamma_0^E + \gamma_1^E d_{i,t}^p + h\left(v_{i,t-1}^p, \vartheta^E\right) + \eta_{i,t} \quad \text{for} \quad E = \{0, 1\}. \tag{4}$$

Subgroup estimations provide hints as to what are the contributing factors that generate the incumbency effect. They are limited, however, in their potential to identify a specific causal effect of the subgroup characteristic. Say I find, for example, a large incumbency advantage effect for full-time mayors but only a small effect in the sample of part-time mayors. It is now correct to say that within each of those samples, I have estimated a consistent effect. However, I cannot claim that the differences are solely driven by the status of the mayor and not by other sample characteristics.

For predetermined variables (like the mayor status, municipality size, party identity and time of the election) this problem is limited to uncontrolled subsample characteristics. When I also consider sample splits based on postdetermined variables (fiscal characteristics) there is the additional problem of sorting into the specific subgroups. Overall, the heterogeneity analyses can highlight

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[21] I mainly use a specification with triangular kernel as preimplemented by Stata (see Calonico et al., 2014). However, I also experimented with a uniform or an Epanechnikov kernel. The results remain unchanged.

[22] The way I split the sample is similar to Folke and Snyder (2012).

Table 3
Main results — incumbency effect for mayors.
Source: Own calculations.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Probability of winning in ME in t						
d	0.420***	0.389***	0.345***	0.360***	0.392***	0.410***
	(0.030)	(0.048)	(0.078)	(0.063)	(0.016)	(0.035)
N	1231	487	220	1231	13,797	13,797
R2	0.177	0.152	0.119	0.178	0.313	0.314
Sample	5%	2%	1%	5%	60%	60%
Control function	None	None	None	Linear	Linear	4th order

Notes: Significance levels: *p < 0.10, **p < 0.05 and ***p < 0.01. Standard errors in parentheses are robust and clustered on the level of each individual municipality election. The dependent variable is the indicator variable whether the respective party obtains the mayor's office in *t*. The regressions in columns 1–3 are based on a limited sample within the respective margins and include only a constant and the treatment dummy. The estimations in columns 4–6 include a polynomial control function of the degree indicated which is specified to be flexible on both sides of the threshold.

interesting differences of the causal effect in these subgroups, however, interpretation of these disparities needs to be taken with caution.

4. Results

The following section consists of three parts. In the first part, I present the main results of the RDD analysis. The estimation results in various subgroups are highlighted in part two. The third part focuses on the validation of the RD design.

4.1. Main results

Table 3 presents the findings for the causal effects of the electoral advantage for the German mayors. I evaluate the effect of having a mayor of a certain party in office during the election period in $t - 1$ on the election outcome of this party in the next mayoral election in *t*. The dependent variable is an indicator that takes a value of one if the party obtained the mayor's office in *t*. The columns show the basic effects under different specifications. The results are generally stable over all specifications and range within a 35%–42% increase in the probability of holding office after the next election.

Columns 1–3 present the limited sample approach with varied closeness of the elections. In column 2, the estimation uses a margin from the threshold of below 2 percentage points. Each observation in this subsample is such that the party's candidate either won or lost with a distance to the best opponent of below 2 percentage points (hence at a maximum distance of 51% to 49% when there are two candidates). Within this margin, I consider the precise outcome of the local election to be a random event. I estimate the incumbency advantage to be 38.9 percentage points in the probability of winning the election.

Alternatively, I also specify limited sample regressions with a margin of 5 and 1 percentage points accordingly (see columns 1 and 3). The 5 percentage point margin might be hard to defend as still random in treatment. The 1% sample, however, is quite restrictive in the available sample. Using a control function, I present the results from three further specifications (see columns 4–6). The estimation in column 4 uses a linear control function with the 5% sample. Columns 5 and 6 use the full sample and a polynomial control function of degree one and four respectively.[23] All results are within a similar range and none are statistically different from the others.

Graphical evidence on the large scope of the effect is presented in the two panels of Fig. 1. The left panel plots the raw data in bins of the margin of victory in $t - 1$ (1 percentage point bins) against the bin average of the probability of gaining the office in *t* for the entire relevant bandwidth. To visualize the inherent discontinuous jump at the threshold, I superimpose a regression fit from a local linear regression (using a Epanechnikov kernel). The graph illustrates that a party that just lost the last mayoral race only has a 28–30% chance to gain office (on average) compared to the winner of the last election who will win with a probability of just under 70%. In the left panel, I show the robustness of this result to varying the bandwidth across the entire spectrum from 0.02–0.60. I also highlight the results when the optimal bandwidth selections by Imbens and Kalyanaraman (2011) or Calonico et al. (2015) are implemented. The results always remain similar in sign, scope and significance.

I conclude that there is a large and persistent incumbency effect in German mayoral elections. While the effect may appear to be large at the outset, it is only slightly larger than the results for the US mayors. Ferreira and Gyourko (2009) report a discontinuous jump in the probability of winning of 33% for Democratic mayor candidates in US cities. In contrast, authors focusing on developing countries have found zero or even negative incumbency effects Titiunik (2009) for Brazilian mayors, Linden (2004) and Uppal (2009) for Indian parliament, and Miguel and Zahidi (2004) for the parliament in Ghana. They interpret their results to show that politicians engage in rent-seeking activities.

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[23] The polynomial function is flexible on either side of the threshold. I choose a polynomial of degree four as the fifth order was no longer significant. All regressions use robust standard errors, clustered on the level of each individual municipality election.
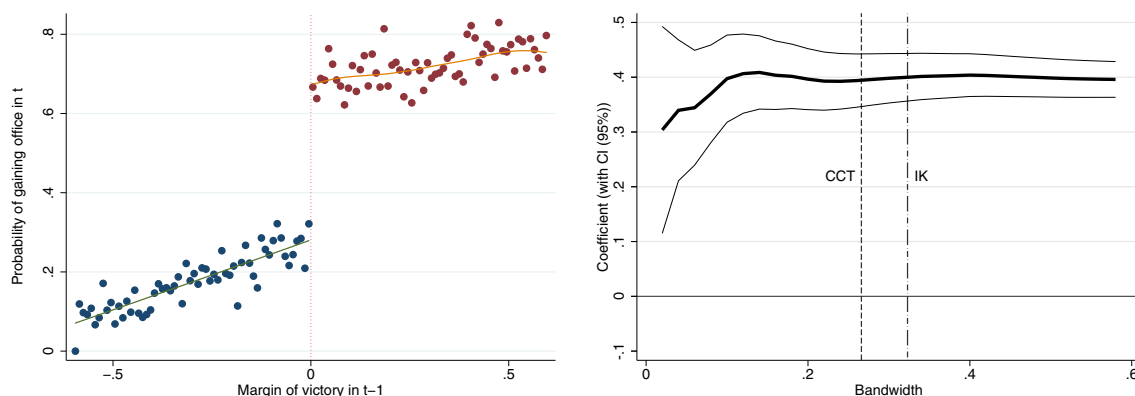
Fig. 1. Main result — incumbency effect. *Notes*: This figure graphically illustrates the effect in the probability of winning in *t* at the zero threshold of the margin of victory in *t* − 1. The left panel shows the data grouped in bins, each bin representing an interval of 1% in the margin of victory. The line fitted onto the data is based on a local kernel regression using endogenous Epanechnikov weights. The right panel shows the non-parametric estimates when the bandwidth is varied between 0.02 and 0.60. The vertical lines indicate the optimal bandwidth according to CCT and IK respectively (using a triangular kernel).
Source: Own calculations.

Interestingly the size of the incumbency advantage for German mayors is larger than the electoral advantage of German politicians in higher level elections. Hainmueller and Kern (2005) report an incumbency effect of about 20 percentage points for the party of a district candidate in the election for the German parliament (*Deutscher Bundestag*). Ade et al. (2014) show that a similar sized incumbency effect also exists for district candidates in German state elections.

While the probability of winning the next mayoral election is ultimately the most informative measure of the incumbency advantage, it is of interest to analyze the underlying mechanisms that comprise this total effect. The probability of winning is, in fact, influenced by two contributing factors: (a) a significantly lower vote share in election at *t* for the "marginal" losers in *t* − 1 compared to the "marginal" winners, as well as (b) an effect on the probability that the party participates in the next election.

Table 4 presents the results of the RDD analysis along those dimensions. Panel 1 highlights the effect of just getting into office on the probability of running a candidate in the next mayoral election. The estimates show that there is a causal treatment effect in the order of 14–16 percentage points. A party that narrowly obtained the mayor's office is therefore about 14–16 percentage points more likely to run a candidate in the next election.

In the second panel, I illustrate the electoral advantage in terms of the received vote share. The incumbent party receives a bonus of 15–17 percentage points in the next mayoral election. These estimates are not to be interpreted as causal effects as these are potentially biased due to selection. I observe vote shares only for parties that participated in the race for mayor. The fact that parties

Table 4
Decomposing the total effect — two mechanisms.
Source: Own calculations.

	(1)	(2)	(3)	(4)
Panel 1: Prob of running in ME in t				
d	0.160***	0.158***	0.141***	0.139***
	(0.034)	(0.043)	(0.020)	(0.022)
N	487	1231	18,761	5349
R2	0.04	0.04	0.15	–
Panel 2: Vote share in ME in t				
d	0.163***	0.147***	0.174***	0.173***
	(0.020)	(0.026)	(0.013)	(0.013)
N	403	1029	14,831	4458
R2	0.14	0.17	0.33	
Sample	2%	5%	Full	21.2% / 21.8%
Control function	None	Linear	3rd order	CCT opt. BW

Notes: Significance levels: *p < 0.10, **p < 0.05 and ***p < 0.01. Standard errors in parentheses are robust and clustered on the level of each individual municipality election. In Panel 1, the dependent variable is the indicator variable whether the respective party ran a candidate in the mayoral election in *t*. In Panel 2, the dependent variable is the vote share that the party received in the mayoral election in *t*. The regression in columns 1 is based on a limited sample within a margin of victory of 2 percentage points and includes only a constant and the treatment dummy. The estimations in column 2 is within the 5% margin and a linear control function and column 3 runs the entire sample including a polynomial control function of the third degree which is specified to be flexible on both sides of the threshold. Column 4 specifies a non-parametric specification using local linear regressions, an optimal bandwidth according to CCT and a triangular kernel.

can be expected to make a strategic choice in whether to even participate or not introduces a selection bias into the estimate of the vote share advantage. Moreover, the bias cannot be determined in sign.[24]

Generally, I can conclude that both mechanisms are of significant importance. The increase in the likelihood of the party participating in the mayoral election can account for about 15 percentage points in the probability of winning. Given a total incumbency advantage of 38 percentage points in the reelection probability, the remaining 23 percentage is due to the electoral gain in terms of vote share.

4.2. Studying the heterogeneous effects

Given the substantial number of elections in the analysis, I can also evaluate the RDD estimate of the incumbency effect on various subgroups. I consider two groups of variables for which I investigate subgroup outcomes. In the final part of this section, I further highlight evidence from additional states both from the former west and the former east of Germany.

Firstly, I analyze subgroup results along specific town characteristics. Here, I consider the position of the mayor (full-time versus part-time)[25], size of the municipality, the specific party identity of the mayor and the time of the elections (before or after 1980).

The subgroup outcomes by position of the mayor and size of the town are of interest as both dimensions are likely to be linked with the amount of resources that the incumbent party can use to regain the mayor's post (see, e.g., Levitt and Wolfram, 1997; Strömberg and Snyder, 2010; Serra, 1994; Folke, 2010; Stratmann, 2009, 2010). Full-time mayors might have a significantly higher electoral advantage as they spend more time on the job, have more contact with the constituency and are likely to have more coverage in the media. Also, parties in larger communities are mostly better organized, have more members and higher electoral campaign budgets.

The analysis of subgroups by the specific partisanship of the mayor is important to illustrate the general nature of the intrinsic advantage.[26] I expect that the findings are neutral with respect to the partisanship of the mayor. Similarly, it is interesting to document potential changes over time. Given that the period of observation goes back all the way to World War II, I can compare estimates from Germany from when the democracy was still young to a political system with more than 60 years of experience and stability (see, e.g., Titiunik, 2009).

The second group of variables comprises information on the fiscal and budgetary state of the municipality over one election period. I ask whether the voters reward the incumbent mayor when the per capita expenditures or the revenue from the local business tax increase and whether they punish when the municipal debt rises. In essence, I ask whether the fiscal measures are of importance for the electoral choice of the voters. This analysis therefore relates to a large literature on economic voting (see, e.g., Folke and Snyder, 2012; Jordahl, 2006; Wolfers, 2007). Moreover, it also helps to evaluate the extent to which the inhabitants vote retrospectively in general (see, e.g., Berry and Howell, 2007; Ferejohn, 1986; Fiorina, 1978).

Table 5 presents the results from the subgroup analyses.[27] Panel 1 shows the results for subgroups of certain town characteristics. Firstly, I split the sample by the mayor status (full-time and part-time employed). I compare the estimates of the incumbency advantage in the sample of only part-time (columns 1 and 2) with the sample of full-time employed mayors (columns 3 and 4). The difference for the two alternative specifications is highlighted in the last columns. I find that full-time mayors receive a significantly larger electoral bonus. The incumbency advantage is 21–34 percentage points larger than those of the part-time mayors.

Next, I divide the sample by municipality size using a population threshold of 5000 voters.[28] The incumbency advantage is larger in municipalities with more individuals, however, the differences are only marginally significant.

The estimates for the above subgroups highlight the specific issue of interpretation of the subgroup estimates. The mayor status for example is, *ex ante*, given and hence exogenous to the incumbent mayor. It is therefore correct to argue that the incumbency advantage is larger in communities with a full-time mayor. However, I cannot claim causality. Towns with a full-time mayor may also have other features in which they differ, for example municipality size. I cannot rule out that it is another mechanism that makes the electoral advantage increase. However, it can be argued that the incumbency advantage estimate is a reliable measure for municipalities with this characteristic.[29]

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[24] On the one hand, one could find it intuitive to argue that only the candidates with a better outlook for the elections, are prone to participate. Under this argument, the vote share (and the probability of winning) just right of the threshold would be the outcome of the better candidates that remained after the less strong politicians dropped out. Hence, the estimates would appear even larger once controlling for participation. On the other hand, it is equally sensible to assume that the better candidates (in the sense of them being more likely to win) have, in fact, better foresight into the outlook of the election and can (given the large incumbency advantage) decide to drop out earlier. Under this argument, it would in fact be the poorer candidates, for example, individuals with a strong ideological component, who remain in the race. Here, the estimates would exhibit an upward bias.

[25] To the extent that the pool of applicants for a full-time and a part-time position differs, this comparison is also linked to the literature of candidate productivity and electoral success (see, e.g., Epstein, 2000; Freier and Thomasius, 2012).

[26] Especially, given the fact that Bavaria is generally considered a conservative stronghold (it has seen no state government other then a conservative since World War II). This subgroup is also interesting as a number of papers have confirmed partisan effects in policies on different governmental level in Germany (see, e.g., Potrafke, 2010, 2012; Freier and Odendahl, 2012).

[27] The analysis here uses the simple limited sample approach (within a narrow bandwidth of 2%) as well as the large sample with a high polynomial control function. In the review process, I also estimated the model using non-parametric estimation (using the CCT algorithm) and found no differences from the estimations above (results not reported but available upon request).

[28] The choice of 5000 eligible voters is arbitrary. The intention was to capture a notion of a larger local center versus a village. The precise division is not of crucial importance and the results remain comparable for alternative thresholds such as 3000, 4000 or 10,000.

[29] I also run estimations in which I include both the full-time versus part-time mayor variables and the measure of municipality size. From that horse race model, I find that it is the mayor's position that prevails (in the same magnitude) and the municipality effect turns insignificant. Results are available upon request.

Table 5
Subgroup analysis.
Source: Own calculations.

| | Dependent variable: Probability of winning | | | | | |
| | E = 0 | | E = 1 | | Difference | |
	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Town characteristics						
Mayor status	0.211***	0.300***	0.546***	0.512***	0.336***	0.212***
(E = 0: part-time, E = 1: full-time)	(0.075)	(0.049)	(0.065)	(0.049)	(0.100)	(0.069)
Municipality size	0.332***	0.377***	0.540***	0.508***	0.208*	0.132*
(E = 0: <5000, E = 1: ≥5000)	(0.057)	(0.040)	(0.093)	(0.069)	(0.109)	(0.079)
Party identity of the mayor	0.359***	0.381***	0.439***	0.452***	0.081	0.071
(E = 0: CDU, E = 1: SPD)	(0.052)	(0.038)	(0.066)	(0.048)	(0.064)	(0.048)
Decade of the elections	0.340***	0.341***	0.411***	0.445***	0.071	0.103
(E = 0: <1980, E = 1: ≥1980)	(0.089)	(0.060)	(0.060)	(0.042)	(0.109)	(0.072)
Panel 2: Fiscal characteristics						
Diff in total expenditures	0.283***	0.373***	0.551***	0.531***	0.267**	0.156*
(E = 0: low, E = 1: high)	(0.091)	(0.080)	(0.092)	(0.088)	(0.128)	(0.093)
Diff in debt	0.407***	0.419***	0.379***	0.433***	−0.028	0.014
(E = 0: low, E = 1: high)	(0.079)	(0.046)	(0.121)	(0.070)	(0.141)	(0.084)
Diff in revenue trade tax	0.366***	0.362***	0.456***	0.503***	0.091	0.141*
(E = 0: low, E = 1: high)	(0.084)	(0.049)	(0.113)	(0.064)	(0.144)	(0.083)
Sample	2%	60%	2%	60%	2%	60%
Control function	None	3rd order	None	3rd order	None	4th order

Notes: Significance levels: *p < 0.10, **p < 0.05 and ***p < 0.01. Standard errors in parentheses are robust and clustered on the level of each individual municipality election. The dependent variables are the indicator variable whether the respective party obtained the mayor's office in t in the respective subsample indicated in the left column. Columns 1 and 3 are based on a limited sample within a margin of 2% for the subsample labeled E = 0 and E = 1 respectively. Columns 2 and 4 consider a 60% sample and a cubic control function within the subsamples. Columns 5 and 6 show the estimated difference between the respective two samples.

I test whether the specific partisanship of the mayor matters for the incumbency effect in the third row. As described above, I use data on candidates for the conservative party ("*CDU*") and the social democratic party ("*SPD*"). Estimating the model on the separate sample, I find no significant effect of the particular party affiliation. Point estimates are slightly higher for SPD candidates, however, the differences are imprecisely measured even if I include further covariates (time dummies, mayor status, municipality size, economic variables).

Further, the electoral advantage is constant over time. I split the sample in half, using observations from before the year 1980 and after. The differences in the estimates are insignificant from zero. The same is the case when I estimate the model by each decade (estimates not shown here). This is interesting as it highlights that the incumbency advantage for German mayors was present and substantial even when Germany was just a young democracy shortly after World War II.

In panel 2 of Table 5, I turn to subgroup analysis using economic variables that proxy the fiscal state of the municipality. At first, I look at the difference in total expenditures (per capita) from the year before the incumbent mayor took office to the year before the next mayoral election. This difference is informative on whether the incumbent mayor was successful in increasing the expenditure level or not. I split the sample at the median of the distribution and compare the half that increased expenditures most to those that increased only slightly or lowered the expenditure level. I find that higher spending correlates with a larger incumbency estimate. The difference is a significant increase of 16–27 percentage points in the probability of winning. Voters reward the incumbent mayor for spending hikes.

In contrast, voters do not take local debt levels into account when voting for the next mayor. I again split the sample at the median of the distribution for new debt and find that the incumbency advantage is similar in both groups. Finally, I also compare municipalities with regard to the increase or decrease in the level of revenue from the local business (trade) tax. This measure is interesting as it proxies for a successful local business activity as opposed to expenditures, which can be increased even if the local economy is not doing well. Here, I find sizable and marginally significant differences in the order of 9–14 percentage points. Note that those effects are notably smaller than the findings for the expenditure level.

As argued above, the findings in the subgroup analysis for the economic variables should not be taken at face value. Issues of selection into the respective groups and problems of omitted variable bias are of large concern in the interpretation of those results. However, comparing the results for expenditures, debt and revenues are still quite informative. Changes in expenditures are clearly visible to the voters and will be associated with the work of the incumbent mayor. Here, I find clear and sizable effects. Voters know if the local economy is booming (proxied by the revenue from trade tax), although, this fact is not directly linked to the mayor's work. The effect reported is smaller, but still meaningful. The local debt level is not directly assessable by the voter and exerts no effect whatsoever.

To infer whether the results of the party incumbency advantage are specific to the state of Bavaria, I also collected data on mayoral elections in further German states both in the former western part and in states from the former east.[30] In particular, I obtained data

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[30] For the general analysis I use only data for Bavaria. The data from the other states is limited as the time series is quite short and economic variables are not generally available.

Table 6
Evidence from additional states.
Source: Own calculations.

	Dependent variable: Probability of winning					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Western states						
d	0.538***	0.496***	0.573***	0.461***	0.469***	0.502***
	(0.073)	(0.106)	(0.142)	(0.047)	(0.066)	(0.074)
N	131	66	131	1153	1153	490
R2	0.30	0.25	0.30	0.32	0.32	–
Panel 2: Eastern states						
d	0.248	0.192	0.066	0.337***	0.398**	0.379***
	(0.152)	(0.229)	(0.284)	(0.080)	(0.164)	(0.114)
N	44	21	44	478	478	232
R2	0.06	0.04	0.08	0.32	0.32	–
Sample	5%	2%	5%	60%	60%	22.7%/ 38%
Control function	None	None	Linear	Linear	4th order	CCT BW

Notes: Significance levels: *p < 0.10, **p < 0.05 and ***p < 0.01. Standard errors in parentheses are robust and clustered on the level of each individual municipality election. The dependent variables are the indicator variable whether the respective party obtained the mayor's office in *t*. Panel 1 highlights the results for the western states of Hessen (1993–2009), Rheinland-Pfalz (1994–2009) and Saarland (1994–2009). Panel 2 investigates the sample of former eastern states Thüringen (1999–2009) and Brandenburg (2001–2010). Columns 1 and 2 are based on a limited sample within margins of 5% and 2%. The estimations in columns 3–5 include a polynominal control function of the degree indicated which is specified to be flexible on both sides of the threshold. Column 6 specifies a non-parametric specification using local linear regressions, an optimal bandwidth according to CCT and a triangular kernel.

on elections in *Hessen*, *Rheinland-Pfalz* and *Saarland* for the west, and *Brandenburg* and *Thüringen* for the east. For generalization, comparing the incumbency advantage estimate from Bavaria with other states is of interest. Bavaria grants mayors a strong position in local politics, whereas other states in Germany have local constitutions with a less powerful mayor position. Also, German states from the former east might be fundamentally different as the democracy there is still young and political competition differs.

In Table 6, I show the results of the RDD analysis in the additional German states. In panel 1, I present the estimates of different specification in the three western states. The party incumbency advantage in those states is a large and significant effect in the order of 46–57 percentage points in the probability of winning in the next mayoral election. In the states of the former east (panel 2), estimation results are more variable, partly due to the smaller sample size, and appear to be smaller.

At first sight, it may appear as if incumbency effects in other German states are quite different from the effects observed in Bavaria, although, the points estimates here are not statistically significantly different. Investigating the differences further, it becomes clear that the sizes of towns in different German states are drastically different. In particular, the other western states generally have an average town size of more than 10,000 inhabitants, while the estimates for the eastern states come from particularly small towns with on average only 2000 inhabitants.[31] To correctly compare incumbency effects, I should therefore consider the estimates from the analysis for different town sizes. For small towns in Bavaria, I estimated an incumbency advantage of about 33–38 percentage points (see Table 5), which compares very well with the numbers for other eastern states. For larger Bavarian municipalities the effect was between 50–54 percentage points which is very well in line with the results for the additional western states. Overall, I conclude that the evidence for the mayoral incumbency effects throughout Germany is very comparable. Despite the fact that Bavarian mayors are granted a stronger position (by state constitution) than other mayors in Germany, incumbency effects remain similar sized. One explanation for this, could be that voters do not in fact perceive the role of the mayor to be different by state.

4.3. Validity of the RDD

The evidence above crucially relies on the validity of the identifying assumptions. While it is impossible to directly observe whether the election outcome and hence the treatment were subject to sufficient randomness, there are two implicit tests. If treatment is indeed randomly assigned close to the threshold, the observations must be comparable in predetermined observables. Also, given random local assignment, I should not observe differences in the number of observation around the threshold.

Table 7 in Appendix A highlights the first test for a broad range of predetermined variables. I distinguish between two groups of variables: political variables of past election periods and elections as well as economic variables. I show the results of the model in Eq. (3) using the predetermined observables as the dependent variable. I thereby test, whether the distribution differs significantly at the threshold. The test confirms the validity of RDD if I find no significant differences. For all variables I use the predetermined observables both for the last and the next to last election (or election period) and I present the estimation results for three different specifications.

As political variables (see panel 1) I use the following observables: Party incumbency status in prior election periods, the vote share of the party in past elections, the participation in the mayoral race, mayoral position (full-time or part-time), number of candidates in

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[31] For the year 1999, the average population of municipalities in Bavaria was about 4300. In the other German states there were the following numbers: Saarland — 20,650, Hessen — 11,000 and *Rheinland-Pfalz* — 14,500 (note that we can only use the set of larger municipalities from this state in the analysis (the so-called *Verbandsgemeinden*)), and Brandenburg — 1484 and *Thüringen* — 1800.

the first round of the mayoral election, number of eligible voters and the turnout rate. I find no significant differences in either of those variables for any specification. Specifically, the fact that the incumbent status and the vote share come out to be well balanced is assuring that the quasi-experiment is valid. Caughey and Sekhon (2011) argue that exactly these variables are of major concern for the validity of the design.[32]

In panel 2, I also check the distributions of the fiscal data just prior to the past elections (the observation refers to the year before the election). Again, I find no predetermined differences in any of the following variables: total municipal expenditures (per year and capita), the stock of debt (per capita), the revenue from trade tax (per capita) and a measure of taxing power (share of tax revenue to total revenue).

The argument of perfectly balanced predetermined variables not only includes the mean of the distribution but also higher moments of the predetermined variable distribution. Therefore, I group the data in bins (one percentage point in the margin of victory) and compute the standard deviation per bin both for past incumbency status and the prior vote shares of the party. Fig. 2 in Appendix A shows that also the 2nd moment of the distribution of these predetermined variable is well balanced around the threshold.

As a second check, I also investigate the number of observations just around the threshold. Given that assignment is random close to the threshold, I should not observe any differences in the observed frequencies. I present two graphs in Fig. 3 in Appendix A showing that this is indeed the case. In the left graph, I use bins of 1% in the margin of victory and the full sample. I superimpose a fitted line based on a linear local regression to allow for comparison directly at the threshold. Similarly, I also present a graph (on the right) in which I use a smaller bin size (0.25 percentage points) and observations that are no further from the threshold than 0.1 in the margin of victory. For both graphs, I observe no difference in the frequencies just around the thresholds.

Overall, the analysis of both the predetermined variables as the frequencies of observations gives a convincing argument for the validity of the research design. Close outcomes in German municipal mayoral elections can be considered a valid research design to establish the causal effect of the incumbency status. Reassuringly, a study by Eggers et al. (2015) that focused entirely on validating close election RDDs around the world confirmed for our data that the research design is indeed valid.[33]

A final test that I estimate a valid treatment effect can be given by running placebo regressions. Table 8 in Appendix A shows the results of simulating alternative thresholds. First, I simulate that a party already obtained access to the mayor's office if the margin of victory was only -0.05. This implies that the candidate of a party that just obtained above 47.5% (against an opponent with 52.5%) already (hypothetically) got the position. Alternatively, I simulate the opposite case, in which a party had to receive a winning margin of 0.05 to get hold of the mayor's office. Both tests show that there is no effect on those simulated thresholds.[34]

5. Conclusions

In this study, I examine the electoral advantage for the party of the incumbent mayor. I use quasi-random variation in the partisanship of the mayor to identify the causal incumbency advantage effect. Estimation results are based on a regression discontinuity design relying on close elections. The data comprises about 25,000 mayoral elections from the German state of Bavaria between 1945 and 2010.

The main results show a party incumbency effect on the order of 38–40 percentage points in the probability of winning the next election. These results are stable over a range of different specifications. The identifying assumptions of the research design are supported in a variety of validity checks.

Decomposing the effect, I find that about 40% of the total effect comes from increasing the probability of participation of that party in the next mayoral election. The other 60% percentage points are increases in the vote share of the party of the incumbent mayor.

In several analyses, I highlight interesting differences of the incumbency advantage in subgroups. First, I show that the incumbency effect is larger for full-time mayors and increasing with municipality size. These results indicate that more time spent with the electorate and more resources available might be important channels that make for the incumbency advantage. Secondly, I can show that the electoral advantage is both independent of the particular party identity of the mayor and constant over the last six decades, which highlights the universal nature of the incumbency phenomenon.

Moreover, I investigate how local fiscal measures are related to the incumbency effect. I find that the treatment effect is larger when local public spending increases, but independent of the municipal debt levels. These results show that voters are at least partly backward looking and take the election as an opportunity to hold a referendum on past performance.

Using data from additional German states, I show that the results from Bavaria are comparable to the electoral advantage for mayors across all of Germany. This indicates that the electoral advantage is in fact independent from the factual constitutional power that mayors hold in Germany.

The incumbency advantage for mayors in Germany appears to be large and they are indeed larger than estimates of incumbency effects for other German politicians. However, they compare well with estimates reported for the seats in the US House of Representatives Lee, 2008 and for US mayors Ferreira and Gyourko, 2009. Compared to negative incumbency effects in developing countries, they further highlight the apparent differences between well established and developing democracies.

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[32] They show that a similar design used by Lee (2008) fails exactly due to predetermined differences in the past incumbency status. The incumbent candidate is significantly more likely to win a close race, which invalidates the research design. The argument that they make, raises concern that the identification strategy of using close election might not be applicable in all instances.

[33] The study by Eggers et al. (2015) asked for the data of this paper and confirmed the same tests that I have just presented.

[34] Note that a specification using a non-parametric approach with CCT optimal bandwidth is not very productive for this placebo exercise. The CCT bandwidth includes the original big jump and the linear specification fails to be flexible enough. Against all visual inspections and the results found above, a non-parametric approach falsely signals that the placebo tests do not work.

Acknowledgments

Appendix A

Table 7
RDD validity — predetermined variables.
Source: Own calculations.

	Predetermined variables from election period in					
	$t-1$			$t-2$		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Political variables						
Incumbency status	−0.030	−0.068	−0.027	−0.027	−0.035	−0.043
	(0.029)	(0.071)	(0.050)	(0.033)	(0.073)	(0.052)
Vote shares	−0.022	−0.047	−0.036	−0.025*	−0.051	−0.037
	(0.014)	(0.033)	(0.024)	(0.015)	(0.036)	(0.025)
Participation in the mayoral race	0.044	0.046	0.046	0.015	0.037	0.004
	(0.029)	(0.049)	(0.037)	(0.033)	(0.057)	(0.041)
Mayor status	−0.040	−0.003	−0.035	−0.022	0.028	−0.007
	(0.026)	(0.040)	(0.028)	(0.027)	(0.038)	(0.028)
# of candidates in the race	−0.025**	−0.013	−0.005	−0.018	−0.066	0.010
	(0.012)	(0.017)	(0.019)	(0.041)	(0.054)	(0.040)
# of voters	−159.14	−56.613	−114.680	−164.49	−125.410	−112.773
	(203.47)	(221.843)	(156.768)	(205.47)	(209.599)	(147.720)
Turnout rate	0.002	−0.002	0.001	0.005	0.002	0.007
	(0.005)	(0.007)	(0.005)	(0.005)	(0.007)	(0.005)
Panel 2: Economic variables						
Expenditures (per capita)	18.926	59.877	2.222	7.338	50.113	44.046
	(38.334)	(55.487)	(43.900)	(50.991)	(81.028)	(56.295)
Debt (per capita)	0.363	0.385	0.772	−4.481	−8.056	−5.490
	(0.304)	(0.370)	(0.638)	(4.218)	(7.668)	(5.333)
Revenue from trade tax (per capita)	−6.304	10.141	0.456	4.000	4.758	3.181
	(11.848)	(14.261)	(12.626)	(13.443)	(16.441)	(13.347)
Tax power	−0.005	−0.010	−0.005	−0.002	−0.009	−0.008
	(0.006)	(0.007)	(0.006)	(0.007)	(0.011)	(0.008)
Sample	Resp. BW	5%	60%	Resp. opt. BW	5%	60%
Control func./opt. BW selector	CCT	Linear	4th order	CCT	Linear	4th order

Notes: Significance levels: *p < 0.10, **p < 0.05 and ***p < 0.01. Standard errors in parentheses are robust and clustered on the level of each individual municipality election. The dependent variables are indicated in the left column. Each regression coefficient represents the result from a RDD analysis on the predetermined outcome. Columns 1 and 4 are based on a limited sample within a margin of 2%. Columns 2 and 5 consider a 5% limited sample and a linear control function and columns 3 and 6 include the full sample (60% margin) and a fourth-order polynomial control function which is flexible on both sides of the threshold.

Table 8
RDD validity — placebo test (−5%, +5%).
Source: Own calculations.

	−5%			+5%		
	(1)	(2)	(3)	(4)	(5)	(6)
d	0.033	0.036	0.032	−0.018	−0.014	0.030
	(0.038)	(0.050)	(0.028)	(0.042)	(0.055)	(0.030)
N	516	1243	13,797	471	1210	13,797
R2	0.00	0.00	0.29	0.00	0.00	0.29
Sample	2%	5%	Full	2%	5%	Full
Control function	None	Linear	3rd order	None	Linear	3rd order

Notes: Significance levels: *p < 0.10, **p < 0.05 and ***p < 0.01. Standard errors in parentheses are robust and clustered on the level of each individual municipality election. The dependent variable is the indicator variable whether the respective party obtained the mayor's office in *t*. Columns 1–3 highlight the results of the placebo test in which we simulate that a party obtained the mayoral incumbency status also if it lost the preceding mayoral election with at most 5 percentage points. Columns 4–6 present the estimates for the reverse placebo test in which a party needed more than a 5 percentage point winning margin to gain the incumbency status. The regressions in columns 1 and 4 are based on a limited sample within a margin of victory of 2 percentage points and include only a constant and the treatment dummy. The estimations in columns 2 and 3 and 5 and 6 include a polynomial control function of the degree indicated which is specified to be flexible on both sides of the threshold.
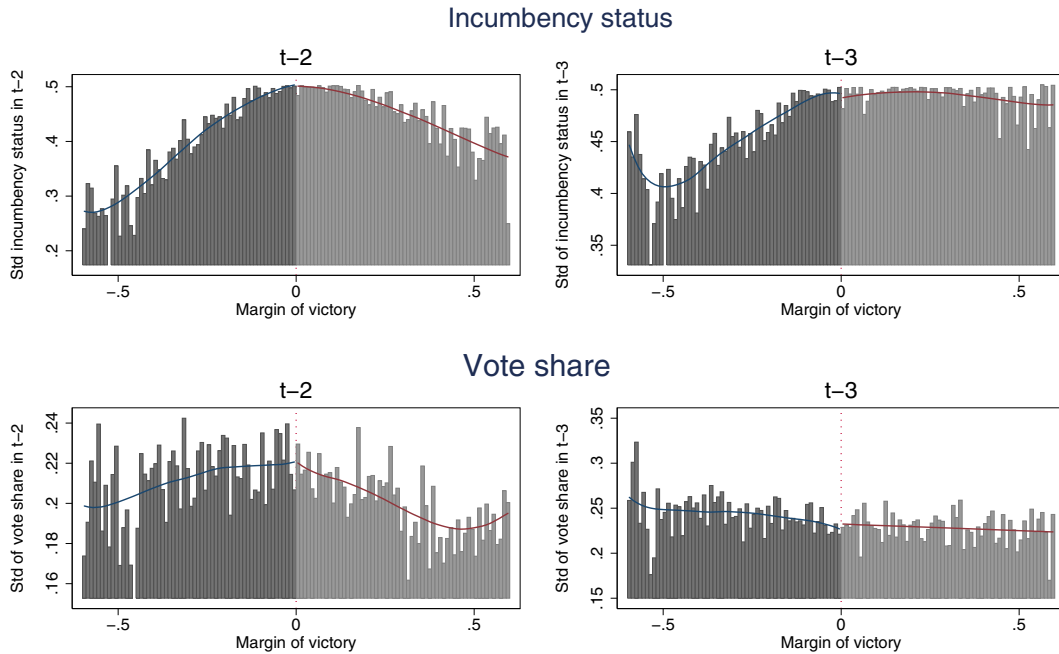
Standard deviations (per cell)

Incumbency status

Vote share

Fig. 2. RDD validity — 2nd order moments of past political performance. *Notes*: This figure illustrates the second moments of the two most important predetermined variables in $t-2$ and $t-3$: the past incumbency status and the vote share in the last mayoral elections. The graph highlights that the standard deviations within group bins of 1% in the margin of victory are not different at either side of the threshold. The line fitted onto the data is based on a local kernel regression using endogenous Epanechnikov weights.
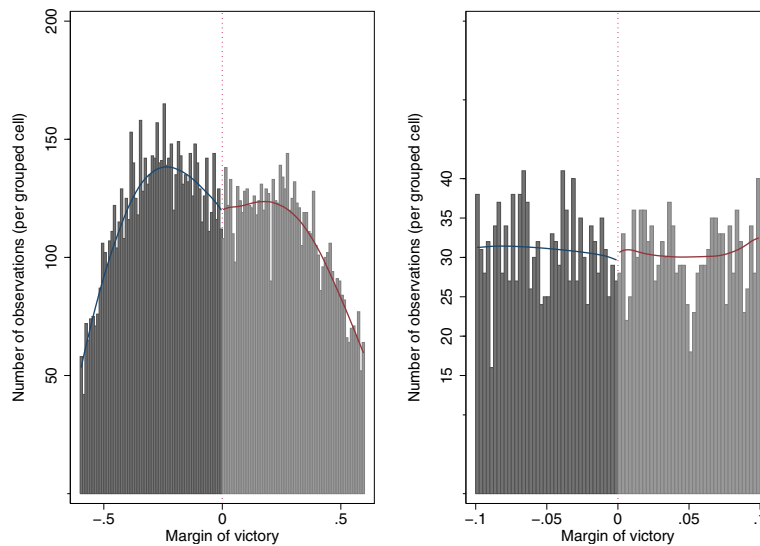*Source*: Own calculations.

Fig. 3. RDD validity — frequency histograms. *Notes*: This figure presents the frequencies of observations in the data with respect to the margin of victory. Each bin in the left graph represents an interval of 1% in the margin of victory. In the right panel, the graph is zoomed in further and represents the frequencies within bins of 0.25% in the margin of victory.
Source: Own calculations.

References

Ade, F., Freier, R., Odendahl, C., 2014. Incumbency effects in government and opposition: evidence from Germany. Eur. J. Polit. Econ. 360 (C), 117–134.
Alesina, A., Rosenthal, H., 1995. Partisan Politics, Divided Government, and the Economy. Cambridge University Press.
Ansolabehere, S., Snyder, J.M., 2004. Using term limits to estimate incumbency advantages when officeholders retire strategically. Legis. Off. Q. XXIX, 487–515.
Ansolabehere, S., Snyder, J.M., Stewart, C., 2000. Old voters, new voters, and the personal vote: using redistricting to measure the incumbency advantage. Am. J. Polit. Sci. (ISSN: 00925853) 440 (1), 17–34 (URL http://www.jstor.org/stable/2669290).
Ansolabehere, S., Snowberg, E.C., Snyder, J.M., 2006. Television and the incumbency advantage in U.S. elections. Legis. Stud. Q. 31 (4), 469–490.
Berry, C.R., Howell, W.G., 2007. Accountability and local elections: rethinking retrospective voting. J. Polit. (ISSN: 1468-2508) 69 (3), 844–858. http://dx.doi.org/10.1111/j.1468-2508.2007.00579.x.
Besley, T., Case, A., 1995. Incumbent behavior: vote-seeking, tax-setting, and yardstick competition. Am. Econ. Rev. 85 (1), 25–45.
Brollo, F., Nannicini, T., 2012. Tying your enemy's hands in close races: the politics of federal transfers in Brazil. Am. Polit. Sci. Rev. 106 (04), 742–761.
Bundesbank, 2000. Zur entwicklung der gemeindefinanzen seit dem jahr. Monatsbericht, July 2007.
Calonico, S., Cattaneo, M.D., Titiunik, R., et al., 2014. Robust data-driven inference in the regression–discontinuity design. Stata J. 14 (4), 909–946.
Calonico, S., Cattaneo, M.D., Titiunik, R., 2015. Optimal data-driven regression discontinuity plots. J. Am. Stat. Assoc. http://dx.doi.org/10.1080/01621459.2015.1017578.
Caughey, D., Sekhon, J.S., 2011. Elections and the regression discontinuity design: lessons from close US House races, 1942–2008. Polit. Anal. 19 (4), 385–408.
Costas-Pérez, E., Solé-Ollé, A., Sorribas-Navarro, P., 2012. Corruption scandals, voter information, and accountability. Eur. J. Polit. Econ. 28 (4), 469–484.
Cover, A.D., 1977. One good term deserves another: the advantage of incumbency in congressional elections. Am. J. Polit. Sci. (ISSN: 00925853) 21 (3), 523–541 (URL http://www.jstor.org/stable/2110580).
Cox, G.W., Katz, J.N., 1996. Why did the incumbency advantage in U.S. House elections grow? Am. J. Polit. Sci. (ISSN: 00925853) 40 (2), 478–497 (URL http://www.jstor.org/stable/2111633).
Cox, G.W., Katz, J.N., 2002. Elbridge Gerry's Salamander: The Electoral Consequences of the Reappointment Revolution. Cambridge University Press.
Eggers, A.C., Hainmueller, J., 2009. Mps for sale? Returns to office in postwar British politics. Am. Polit. Sci. Rev. 103 (4), 513–533.
Eggers, A.C., Fowler, A., Hainmueller, J., Hall, A.B., Snyder, J.M., 2015. On the validity of the regression discontinuity design for estimating electoral effects: new evidence from over 40,000 close races. Am. J. Polit. Sci. 59 (1), 259–274.
Epstein, G.S., 2000. Personal productivity and the likelihood of electoral success of political candidates. Eur. J. Polit. Econ. 16 (1), 95–111.
Erikson, R.S., 1971. The advantage of incumbency in congressional elections. Polity 3 (3), 395–405.
Ferejohn, 1986. Incumbent performance and electoral control. Public Choice 50 (1–3), 5–25.
Ferreira, F., Gyourko, J., 2009. Do political parties matter? Evidence from U.S. cities. Q. J. Econ. 124 (1), 399–422.
Fink, A., 2012. The effects of party campaign spending under proportional representation: evidence from Germany. Eur. J. Polit. Econ. 28 (4), 574–592.
Fiorina, M.P., 1978. Economic retrospective voting in American national elections: a micro-analysis. Am. J. Polit. Sci. (ISSN: 00925853) 22 (2), 426–443 (URL http://www.jstor.org/stable/2110623).
Folke, O., 2010. Parties, Power and Patronage (PhD thesis) Stockholm University.
Folke, O., Snyder, J.M., 2012. Gubernatorial midterm slumps. Am. J. Polit. Sci. 56 (4), 931–948.
Freier, R., Odendahl, C., 2012. Do parties matter?: estimating the effect of political power in multi-party systems. Technical Report. German Institute for Economic Research, DIW Berlin.
Freier, R., Thomasius, S., 2012. Voters prefer more qualified mayors, but does it matter for public finances? Evidence for Germany. Discussion Papers.
Gelman, A., King, G., 1990. Estimating incumbency advantage without bias. Am. J. Polit. Sci. (ISSN: 00925853) 34 (4), 1142–1164 (URL http://www.jstor.org/stable/2111475).
Gerber, E.R., Hopkins, D.J., 2011. When mayors matter: estimating the impact of mayoral partisanship on city policy. Am. J. Polit. Sci. 55 (2), 326–339.
Hahn, J., Todd, P., van der Klaauw, W., 2001. Identification and estimation of treatment effects with a regression–discontinuity design. Econometrica 69, 201–209.
Hainmueller, J., Kern, H.L., 2005. Incumbency effects in German and British elections: a quasi-experimental approach. Working Paper.
Hainmueller, J., Kern, H.L., 2008. Incumbency as a source of spillover effects in mixed electoral systems: evidence from a regression–discontinuity design. Elect. Stud. 27, 213–227.
Houser, D., Morton, R., Stratmann, T., 2011. Turned on or turned out? Campaign advertising, information and voting. Eur. J. Polit. Econ. 27 (4), 708–727.
Hyytinen, A., Meriläinen, J., Saarimaa, T., Toivanen, O., Tukiainen, J., 2014. Does regression discontinuity design work? Evidence from random election outcomes. Government Institute for Economic Research Working Papers 59.
Imbens, G., Kalyanaraman, K., 2011. Optimal bandwidth choice for the regression discontinuity estimator. Rev. Econ. Stud. rdr043.
Jacobson, G.C., 1987. The marginals never vanished: incumbency and competition in elections to the U.S. House of Representatives, 1952–82. Am. J. Polit. Sci. (ISSN: 00925853) 31 (1), 126–141 (URL http://www.jstor.org/stable/2111327).
Jordahl, H., 2006. An economic analysis of voting in Sweden. Public Choice 127, 251–273.
King, G., Gelman, A., 1991. Systemic consequences of incumbency advantage in U.S. house elections. Am. J. Polit. Sci. (ISSN: 00925853) 35 (1), 110–138 (URL http://www.jstor.org/stable/2111440).
Knack, S., 1994. Does rain help the Republicans? Theory and evidence on turnout and the vote. Public Choice 79 (1–2), 187–209.
Krehbiel, K., Wright, J.R., 1983. The incumbency effect in congressional elections: a test of two explanations. Am. J. Polit. Sci. (ISSN: 00925853) 27 (1), 140–157 (URL http://www.jstor.org/stable/2111057).
Lee, D.S., 2008. Randomized experiments from non-random selection in U.S. house elections. J. Econ. 142, 675–697.
Lee, D.S., Lemieux, T., 2009. Regression discontinuity designs in economics February, Working Paper 14723. National Bureau of Economic Research (URL http://www.nber.org/papers/w14723).
Levitt, S.D., Wolfram, C.D., 1997. Decomposing the sources of incumbency advantage in the U.S. house. Legis. Stud. Q. (ISSN: 03629805) 22 (1), 45–60 (URL http://www.jstor.org/stable/440290).
Lindbeck, A., Weibull, J.W., 1987. Balanced-budget redistribution as the outcome of political competition. Public Choice (52), 273–297.
Linden, L.L., 2004. Are incumbents really advantaged? The preference for non-incumbents in Indian national elections. MIT Working Paper.
Martins, R., Veiga, F.J., 2014. Does voter turnout affect the votes for the incumbent government? Eur. J. Polit. Econ. 36, 274–286.
Miguel, E., Zahidi, F., 2004. Do politicians reward their supporters? Regression discontinuity evidence from Ghana. UCB Working Paper.
Payne, J.L., 1980. The personal electoral advantage of house incumbents, 1936–1976. Am. Polit. Res. 80 ((4):0), 465–482.
Persson, T., Tabellini, G., 2000. Political Economics. The MIT Press.
Persson, T., Roland, G., Tabellini, G., 1997. Separation of powers and political accountability. Q. J. Econ. (ISSN: 0033-5533) 112 (4), 1163–1202.
Pettersson-Lidbom, P., 2008. Do parties matter for economic outcomes? a regression–discontinuity approach. J. Eur. Econ. Assoc. 6 (5), 1037–1056. http://dx.doi.org/10.1162/JEEA.2008.6.5.1037.
Potrafke, N., 2010. The growth of public health expenditures in {OECD} countries: do government ideology and electoral motives matter? J. Health Econ. 29 (6), 797–810.
Potrafke, N., 2012. Is German domestic social policy politically controversial? Public Choice 153, 393–418.
Rogoff, K.S., Sibert, A., 1988. Elections and macroeconomic policy cycles. Rev. Econ. Stud. (ISSN: 00346527) 55 (1), 1–16.
Serra, G., 1994. What's in it for me? The impact of congressional casework on incumbent evaluation. Am. Polit. Q. 22, 403–420.
Stratmann, T., 2005. Ballot access restrictions and candidate entry in elections. Eur. J. Polit. Econ. 21 (1), 59–71.
Stratmann, T., 2006. Contribution limits and the effectiveness of campaign spending. Public Choice 129 (3–4), 461–474.
Stratmann, T., 2009. How prices matter in politics: the returns to campaign advertising. Public Choice 140 (3–4), 357–377.
Stratmann, T., 2010. Do low contribution limits insulate incumbents from competition? Election Law J. 9 (2), 125–140.
Stratmann, T., 2013. The effects of earmarks on the likelihood of reelection. Eur. J. Polit. Econ. 32, 341–355.

Strömberg, D., Snyder, J.M., 2010. Press coverage and political accountability. J. Polit. Econ. 118, 355–408.
Thistlethwaite, D.L., Campbell, D.T., 1960. Regression–discontinuity analysis: an alternative to the ex post facto experiment. J. Educ. Psychol. (ISSN: 0022-0663) 51 (6), 309–317. http://dx.doi.org/10.1037/h0044319 (URL http://www.sciencedirect.com/science/article/pii/S0022066307653495).
Titiunik, R., 2009. Incumbency advantage in Brazil: Evidence from municipal mayor elections. University of Michigan Working Paper.
Uppal, Y., 2009. The Disadvantaged Incumbents: Estimating Incumbency Effects in Indian State Legislatures vol. 138. Springer, pp. 9–27.
Vogl, T.S., 2014. Race and the politics of close elections. J. Public Econ. 109, 101–113.
Wolfers, J., 2007. Are voters rational? Evidence from gubernatorial elections. Unpublished manuscript. University of Pennsylvania.