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Citation

Nyhuis, D., Block, S., & Harmening, M. (2026). Campaign spending in mixed member proportional systems: how political and institutional context shapes party strategy. *Electoral Studies*, 99, 103027. doi:10.1016/j.electstud.2025.103027

Version: Publisher's Version

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Note: To cite this publication please use the final published version (if applicable).



Campaign spending in mixed member proportional systems: How political and institutional context shapes party strategy

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ARTICLE INFO

Keywords:

Electoral campaigns
Local campaigning
Campaign spending
Mixed member electoral systems
Mixed member proportional systems
Germany

ABSTRACT

Despite extensive work on local campaign spending, existing research has mostly focused on campaign expenditures in majoritarian systems, while disregarding spending patterns under other institutional arrangements. To help fill this gap, we study how parties allocate their funds in mixed member systems. Based on the notion of contamination between the electoral tiers, we argue that spending is less targeted toward winning the district mandate under mixed electoral rules than would be expected in a pure majoritarian system, as parties stand to benefit from a visible district contender even when they lose the race. Studying candidate survey data collected over the course of four German federal elections between 2009 and 2021, this expectation is confirmed. While the general pattern is evident in all four elections, the shifting political and institutional context of campaigning in Germany has changed party strategies. A more proportional electoral system, along with a more fragmented party system has put a nominal mandate within reach of smaller parties, while larger parties are less sure about winning in their former strongholds, prompting parties to move to more targeted spending on competitive seats.

1. Introduction

Given their promise of combining the benefits of proportional representation with a directly accountable representative, mixed electoral systems continue to be a popular alternative to pure majoritarian and pure proportional systems (Shugart and Wattenberg, 2001b). Political science has made great strides in identifying the unique behavioral consequences that follow from this peculiar institutional arrangement. Yet, while we have learned a great deal about electoral behavior (Crisp et al., 2012; Hainmueller and Kern, 2008; Rheault et al., 2020) and parliamentary practice in mixed systems (Chiru and Enyedi, 2015; Sieberer, 2010; Zittel and Nyhuis, 2021), there are still notable gaps in our understanding of how mixed systems shape political behavior. One of these gaps regards parties' campaign strategies. Whereas a handful of contributions have focused on individual campaigning (Bukow and Angenendt, 2019; Chiru, 2015; Zittel and Gschwend, 2008), we do not know how parties react to the unique incentives of mixed systems.

In an effort to help fill this gap, we study campaign spending in the German mixed member proportional system over the course of four federal elections between 2009 and 2021. This period was characterized by shifts in the political and institutional context. Politically, the period

has witnessed the rise of the first nationally successful far-right competitor in the history of the Federal Republic, which has increased parliamentary fragmentation. The scholarly debate on the success of the AfD has somewhat overshadowed an important change in the institutional framework – a more proportional electoral system (Behnke, 2014). Therefore, in addition to studying the impact of a mixed electoral system on parties' campaign strategies, the changing context provides an opportunity to examine the question: How does the political and institutional context impact parties' campaign spending?

Theoretically, our work ties into research on contamination effects in mixed electoral systems (Ferrara et al., 2005; Herron and Misa, 2001). A long-standing notion in research on mixed electoral systems is that the majoritarian and the proportional tier are interdependent. As parties stand to gain electorally from a strong district contender even when they ultimately lose the race, parties field candidates even in hopeless races (Manow, 2011). Extending this line of reasoning, we suggest that parties spend more money on hopeless races than we should expect under a pure majoritarian system.

Having suggested that campaign spending in mixed systems is generally less sensitive to the odds of winning the district mandate, we expect German parties to have shifted to more targeted campaign

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<https://doi.org/10.1016/j.electstud.2025.103027>

Received 11 May 2025; Received in revised form 19 November 2025; Accepted 19 November 2025

Available online 22 November 2025

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spending in recent years due to the changing political and institutional context of German elections. Institutionally, the 2012 electoral reform has effectively rendered the nominal tier irrelevant for the relative parliamentary strength of parties. Whereas voters used to have an incentive to coordinate around few district candidates, leading to strategically split ballots (Gschwend, 2007; Pappi and Thurner, 2002), they are now free to cast a sincere district vote, as winning district mandates no longer impacts the parliamentary composition. This change alone would have likely resulted in smaller margins of victory on the nominal tier. At the same time – and partly as a consequence –, the German party system has become decidedly more fragmented. Both shifts have resulted in more uncertainty about the winner of the nominal mandate. While larger parties are less certain of winning, smaller parties are less certain of losing. We argue that these changes have altered parties' campaign strategies in favor of more targeted spending on competitive races.

Why does this matter? As winning the district mandate has become a more attainable goal, more parties have begun to compete in earnest for the district mandate, such that more money is spent on competitive races overall. However, not only are more parties competing for the district mandates: As districts have become more competitive and are won with smaller margins, parties need to spend more money to stay competitive, making district campaigning more expensive for the individual parties, a monetary arms race that is fueled by a lack of spending caps (Nassmacher, 2006).

We test these arguments by studying district spending based on candidate survey data from the German Longitudinal Election Study over the course of four federal elections between 2009 and 2021. Both expectations are supported by the data. While there is a sizeable effect of the list vote share on campaign spending, we observe an increasing effect of district competitiveness on spending in more recent campaigns.

2. Local campaigning and local campaign spending: the state of the art

Although there is extensive research on local campaigning and local campaign spending in particular, there are gaps in the literature. First, while few studies have considered the size of local campaign budgets (Fouirnaies and Hall, 2014; Pattie and Johnston, 2015), most research has investigated the effects of local campaign spending. For example, there is an extensive debate on the electoral effects of campaign spending in the US, where challenger spending has often been found to be more effective than incumbent spending (e.g., Jacobson, 1990), although these results have occasionally been challenged on methodological grounds (Gerber, 1998; Moon, 2006). Given the more party-centric political system of the UK, research on British constituency campaigning has focused more on party strategy and has generally noted that parties spend more on competitive races (Fieldhouse and Cutts, 2009; Johnston and Pattie, 1995; Pattie et al., 1995). While these studies have undoubtedly furthered our understanding of local campaign spending, the vast majority of studies on campaign spending has analyzed majoritarian electoral systems, begging the question how parties invest their campaign funds in other systems.

Fewer studies have analyzed campaign spending in proportional systems. Here, too, the focus has been on gauging spending effects rather than on explaining spending decisions. Central to this research has been the presumed difference in spending effectiveness between challengers and incumbents, which has typically been rejected for proportional systems (Benoit and Marsh, 2008, 2010; Sudulich and Wall, 2011). Other research has investigated a possible difference between challenger and incumbent spending in open-list PR systems, also finding little evidence for such a difference (Johnson, 2013; Maddens et al., 2006; Samuels, 2001). Yet, while the evidence is consistent, it does not speak

to the question where parties choose to invest their funds in the first place.

Only a handful of studies have investigated campaign spending in mixed systems. For example, Cox and Thies identify a strong spending effect on votes gained in Japanese elections (Cox and Thies, 2000). Closer to the present research interest is the work by Demirkaya et al. (2022) who study the impact of the mixed electoral system on candidate spending in New Zealand. The authors find that district competitiveness has a positive effect on campaign spending, as does list placement. Demirkaya and colleagues explicitly focus on individual strategy rather than party strategy, not least reflected in their empirical measure of campaign spending, which focuses on individual candidates' surplus spending. An explicitly party-centric perspective on campaign spending in mixed systems is taken by Jacob and Pollex (2023). Analyzing the spending decisions of German parties, the authors find that parties spend more on campaigns under conditions of a fragmented party system. As Jacob and Pollex analyze parties' official spending records, their study remains at the state level, while they cannot assess which specific contests parties choose to spend money on.

Finally, how mixed member systems shape campaign strategies is also at the heart of research on campaigning in mixed systems. Although contributions in this field have not specifically focused on campaign spending, spending decisions have occasionally been used to proxy more general campaign efforts (Bukow and Angenendt, 2019; Gschwend and Zittel, 2015; Wüst et al., 2006; Zittel and Gschwend, 2008).

We can summarize the existing research as follows. First, while there is extensive work on campaign spending in majoritarian systems, there is less evidence on the impact of other electoral institutions. Second, most existing research has focused on spending effects, while determinants of campaign spending have been less commonly studied. Third, much of the research on campaign spending has pursued this question from the perspective of individual candidate strategy, while disregarding party strategy. We aim to fill some of these gaps by analyzing party spending under mixed member systems.

3. Campaign spending in mixed member proportional systems

To develop an account of how parties spend their campaign funds in mixed electoral systems, we proceed in three steps. First, we will briefly introduce contamination effects in mixed systems, which we will use to derive expectations. Second, we will discuss general spending incentives in a mixed member proportional system and how party strategy is impacted by contamination. Third, we will outline how the changing political and institutional context of German campaigning is expected to have altered spending decisions.

We will elaborate the theoretical account with respect to the German electoral system. A more nuanced understanding of the specific electoral rules allows deriving more specific expectations, not least regarding the changing context of German campaigning. While we expect the general effect of mixed member systems on campaign spending to be evident in all such systems, an important distinction can be made between mixed member proportional and mixed member majoritarian systems (Shugart and Wattenberg, 2001a), with likely differences in terms of party strategy. As the German electoral system falls decidedly into the former camp, the arguments are more readily applicable to mixed member proportional systems.

3.1. Contamination in mixed member systems

A long-standing idea in research on mixed systems is that such systems shape electoral behavior in ways that differ from pure list systems and pure majoritarian systems – so-called contamination effects.

Conceptually, we can distinguish between three contamination effects. First, voter choices on the list tier can impact their choices on the district tier, thus impeding voter coordination around few competitors as predicted by a Duvergerian account of district competition. Second, voter choices on the district tier can also impact their choices on the list tier, such that district incumbents can increase their parties' list vote share. Such effects need not be limited to incumbents. A local candidate who represents the party during an electoral campaign can boost the list vote share even without winning the mandate. The second contamination effect gives rise to a third contamination effect, where contamination from the district tier to the list tier incentivizes parties to field candidates in as many races as possible – even in districts where they have no chance of winning.

Despite extensive research on mixed systems, the empirical evidence on contamination effects continues to be mixed (Cox and Schoppa, 2002; Crisp et al., 2012; Ferrara et al., 2005; Moser and Ethan, 2004). Part of the reason for the somewhat inconsistent evidence can be explained by the different types of contamination effects. Moreover, parts of the literature have been somewhat careless with the mixed system label, as the specific institutional set-up is likely to impact the strength of contamination effects. Regarding Germany specifically, research has generally found evidence for contamination effects on all three levels, from the list tier to the district tier (Rheault et al., 2020), from the district tier to the list tier (Hainmueller and Kern, 2008), and regarding candidate entry (Rich, 2015).

3.2. Contamination and local campaign spending

The German mixed member system has always been fairly proportional, making the list vote share key for determining the relative strength of parties in parliament.¹ Before the 2012 electoral system reform, some level of disproportionality would stem from surplus seats (Manow, 2011), which arise when parties win more district seats than they are entitled to according to their list vote share (Behnke, 2007). Both before and after the electoral reform, parties got to keep such surplus seats, leading to a slight disproportionality in parliamentary representation.

Such effects notwithstanding, the list vote share has always been the main determinant for parties' parliamentary representation. Therefore, in order to boost their list vote share, even minor parties tend to field district candidates in as many districts as possible to profit from type 2 contamination effects. We argue that campaign spending follows a similar logic, where the dominant goal of parties' campaign spending is to maximize the list vote share rather than to win districts. This means that parties should spend funds on hopeless districts, as an improved list vote share in the districts matters more for their parliamentary representation than winning the district.

While spending money on all races is a reasonable electoral strategy, spending uniformly is not. Parties should be mindful to spend money where the marginal utility of their funds is greatest. While such utility calculations are not trivial, a simple proxy should be that parties spend more where their voter potential is greater.² Consequently, our baseline expectation is that the general voter potential, indicated by the list vote share at the previous election, is the main determinant of parties' district spending.

H1. Parties spend more funds in districts with a higher list vote share at the previous election.

¹ Voters in German federal elections have two votes, one for individual district candidates, one for the state-level closed party list.

² To be sure, while the marginal utility of spending on a district where a party's list vote share approaches 100 percent decreases, such figures are never reached in practice – and most certainly not in the fragmented multi-party system of contemporary Germany.

3.3. The impact of the institutional and political context on local campaign spending

After decades of stability, recent years have witnessed an intense public debate on reforming the German electoral system. The debate was triggered by a 2008 Constitutional Court case on a somewhat arcane detail of the German electoral system, where in rare circumstances additional votes for a party would result in the loss of a mandate. The Constitutional Court ordered a reform of the electoral system, which was adopted in 2011. The Court struck down the new law, prompting another attempt in 2012, which was applied for the first time in 2013 (Behnke, 2014).

While the 2008 court case focused on a minor facet of the German electoral system, the public debate following the court case quickly turned to more relevant features of the electoral system. Throughout the 1990s and 2000s, the number of surplus seats had been growing (Behnke, 2007), leading to seat shares for the larger parties that were out of proportion with their list vote shares. This effect was due to the increasing party system fragmentation, meaning that the list vote share was split among more parties, while the two major parties, CDU/CSU and SPD, continued to win the vast majority of the 299 district mandates.

To rectify the growing disproportionality, the 2012 electoral system instituted a comparatively major change. The most important innovation was the introduction of compensatory seats. Compensatory seats were awarded to parties disadvantaged by the surplus seats, leading to a near-perfect proportionality of the seat shares.³ In other words, the compensatory seats rendered the district tier meaningless for the composition of the federal parliament, as the relative seat shares of the parties became even more closely tied to their list vote shares.

What are the effects of this change and how might it influence campaign spending? First and foremost, there are fewer incentives for voters to strategically split their ballot after the reform. Under the old system, voters often made the choice to cast their list vote for their preferred party, while casting a district vote for a candidate from one of the two major parties (Gschwend, 2007; Pappi and Thurner, 2002), in the hopes of ensuring surplus seats for their preferred party among the top two. After the reform, voters are free to cast sincere votes on both tiers. Given that the relative composition of the parliament is almost perfectly determined by the list vote share, little can be gained by voting for a less-preferred candidate with the district vote.⁴ In practice, this has increased the vote shares of third-party competitors, while decreasing the margins of victory, putting the mandate in reach of more competitors. At first glance, it is counterintuitive that parties should compete for a political prize that can no longer impact their relative strength in parliament, but it can be explained by contamination effects of type 2. Whereas all district candidates can boost the list vote share of their party, this effect should be most pronounced for district incumbents (Hainmueller and Kern, 2008).

Due to the electoral system reform and the more fragmented party system, district competition has become more multipolar. Particularly

³ Under both the old and the new electoral system, parties got to keep their surplus seats when they won more districts seats than they would be entitled to based on their list vote share. The main difference between the old and the new electoral system is that under the old electoral system, the surplus seats would lead to a slight disproportionality in seat shares. Under the new system, the compensatory seats are awarded to the other competitors to ensure a proportional seat allocation.

⁴ To be sure, a split ticket is rational when voters care about who their specific district representative is going to be: However, since voting in Germany is highly structured by party preferences – and parliamentary politics highly party-centric –, voters are more likely to care about the relative strength of the parties in parliament. This is not least evidenced by the fact that many voters do not know the name of their district representative (Rittmann et al., 2023; Westle, 2009).

the AfD and Grüne, and in some areas Die Linke, have been able to bolster their position and are now viable district competitors. Concurrently, CDU/CSU and SPD have lost electoral support and are no longer the obvious choices at the district level. Overall, district competition has become more uncertain. While winning district mandates has become a real possibility for the smaller parties, the larger parties can no longer be certain of winning anywhere. As voters have learned that the district vote is no longer limited to two parties, it is hard to return to the status quo ante with two strong competitors in every district. This process is self-reinforcing from an economic point of view, as increasing vote shares are supported by more state party funds (Piccio, 2014).⁵

As more parties are seriously competing for the district mandate and parties are more uncertain about their electoral prospects in the districts, parties are expected to spend more to have a shot at the district mandate. More importantly, even though the district mandate is less relevant for the composition of the parliament after the electoral system change, more parties are expected to compete in earnest for the mandate, making district competitiveness a consideration for the spending decisions of more parties, who hope to benefit from the incumbency status for their list vote share.

H2. The district competitiveness has an increasingly strong effect on campaign spending after the change in political and institutional context of German campaigning.

4. Data and methods

To study the impact of a mixed member proportional system on campaign spending, we turn to data from candidate surveys fielded by the German Longitudinal Election Study after four federal elections, 2009, 2013, 2017, and 2021 (GLES, 2012, 2014, 2018, 2023). The dependent variable is the absolute size of the campaign budget that candidates received from their parties. Candidates were asked to indicate the overall size of their campaign budgets and the share of their budgets that they received from the party, from donations, and from private funds. To calculate the dependent variable, we multiply the overall size of the budget with the party share of the budget.⁶ Descriptive statistics of the dependent variable are presented in Table A2 in the Appendix.

The hypotheses suggest that the electoral context impacts campaign spending in two ways. Parties are expected to spend more funds in districts where they have a greater voter potential. Empirically, this is captured through the list vote share in the district at the previous federal election. The previous electoral result provides a decent indicator for parties to gauge where their funds will have the greatest impact.

To assess whether parties' campaign spending is impacted by their chances of winning the nominal mandate, we calculate three related

⁵ We should note that while the electoral system has been in flux in recent years, there have been no major rule changes on party financing (Blumenberg et al., 2018; Koß, 2025).

⁶ While the measure provides a reasonable approximation of how much and where parties choose to spend their campaign funds, it is not without challenges, as the survey does not distinguish between party funds from the federal level, the state level, and the local level. While it is not obvious that candidates would be able to pinpoint the source of their campaign funds to such a level of detail, the lack of distinction is nonetheless a challenge. If the party share of the budget was predominantly comprised of local funds, the resulting measure would capture the wealth of the local party organization rather than party strategy. While this problem cannot be completely ruled out, we do observe considerable variation in parties' district budgets over time, suggesting that the measure is more than a proxy for the financial capacity of local party organizations. A related challenge arises when local parties run the district campaigns of their candidates without transferring funds to the candidates. In responding to the survey, candidates would likely consider the money spent by the local party organization on their campaign, whether or not the money was formally transferred to them.

measures of district competitiveness. For parties who won the district mandate at the previous election, we calculate the difference between that parties' nominal vote share and the vote share of the second-placed candidate at the previous election. For losing parties, we calculate the difference between the winning vote share and that parties' vote share. In either case, we assume that the previous electoral result provides a decent indicator for the chances of winning the nominal mandate at the current election. Note that the underlying assumption is that parties who stood no chance of winning the district mandate have little incentive to go all out in their campaign spending, but neither do parties who won the district by a landslide. Note further that personal incumbency is not assumed necessary for parties to develop a sense of where races might be competitive and where they should spend money.

In addition to this indicator of district competitiveness, we calculate the natural logarithm of the measure, as one might expect a non-linear relationship between district competitiveness and campaign spending. For example, a move from a ten percent difference to a five percent difference should have a greater effect on campaign spending than a shift from a thirty percent difference to a twenty-five percent difference, as the odds of winning the mandate remain effectively zero in the latter case. Based on a similar reasoning, some studies use a binary indicator for district competitiveness (e.g., Zittel and Gschwend, 2008), where differences below a certain threshold are considered competitive. While this indicator has the downside of relying on an arbitrary cutoff, we include a binary indicator as a third measure for district competitiveness for ease of interpretation and to enable a comparison between our findings and existing research. Specifically, vote share differences below ten percentage points are considered competitive. We add party fixed effects to control for different budget levels.

Given the considerable shifts in the German party system and increasing levels of electoral volatility, one might reasonably argue that the previous electoral results become a less reliable indicator of parties' electoral prospects. At the same time, given that German polling data is only published at the national level and because data from the German Longitudinal Election Study does not permit a straightforward assessment of the relative party strengths at the district level between elections, parties have little other way of gauging how they will fare at the district level.

Assuming that parties did have more accurate information about their electoral prospects going into the election, the electoral outcome might constitute a better indicator of that information than the electoral outcome at the previous election, notwithstanding the issue of reversed causality, where electoral outcomes predict spending decisions going into the election. We reestimate all model specifications from the main text with this alternative measure of district competitiveness in Tables B1-B4 in the Appendix. For more recent elections, the website www.zweitstimme.org has generated predictions for the district-level outcomes by extrapolating the national trend to the district level (Munzert et al., 2018; Neunhoeffer et al., 2020). The team has retroactively generated their model predictions for earlier elections to assess the accuracy of their model. We were provided these estimates by the curators of the platform and use them as alternative measures of district competitiveness. The downside of these measures is that they suggest a level of data availability in the run-up to the election that does not reflect the true information environment for earlier elections. The model results using these alternative measures of district competitiveness are presented in Tables B5-B8 in the Appendix.

We employ linear regression models. Given that we have distinct expectations for the last election before the electoral system change (2009) and the three elections after the electoral system change (2013–2021), we estimate separate models for the four elections. While it would be possible to pool the data and to estimate a common model with year-fixed effects and interaction terms between the year-fixed effects and the variables of interest, interpreting the separate models is more straightforward and finding the expected patterns using four separate datasets arguably strengthens the results. We restrict the

Table 1

OLS regression: Party budget 2009 (in 1000 Euros).

	Model 1	Model 2	Model 3	Model 4
List vote share (t-1)	0.219*** (0.057)	0.206*** (0.059)	0.206*** (0.057)	0.215*** (0.057)
Distance to mandate (t-1)		-0.028 (0.037)		
Logged distance to mandate (t-1)			-0.750 (0.488)	
Distance to mandate >10 points (t-1)				-2.149 (1.139)
SPD	7.995*** (1.163)	8.041*** (1.165)	8.130*** (1.165)	8.384*** (1.178)
Grüne	3.032 (1.865)	3.505 (1.968)	3.897* (1.946)	4.103* (1.945)
FDP	0.978 (1.797)	1.490 (1.921)	1.880 (1.889)	2.058 (1.882)
Die Linke	0.112 (1.928)	0.543 (2.011)	0.883 (1.990)	1.113 (1.995)
Constant	0.525 (2.132)	1.329 (2.383)	2.557 (2.507)	-0.511 (2.197)
Observations	485	485	485	485
R2	0.304	0.305	0.307	0.309
Adjusted R2	0.297	0.296	0.299	0.300

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

analysis to pure district candidates and dual candidates.⁷ We further restrict the analysis to candidates from the six major competitors in the current German party system: The center-right CDU/CSU, the center-left SPD, the culturally left-leaning Grüne, the economically liberal FDP, the far-left Die Linke, and the far-right AfD. Given the well-known imbalances in response propensity in candidate surveys (Faas et al., 2009),⁸ we include regression weights to counteract imbalances regarding party affiliation and candidate success.⁹

5. Analysis

To study the hypothesized link between electoral context and campaign budgets, Tables 1–4 display the results from sixteen regression models, where the same four model specifications were estimated for the four elections under investigation.¹⁰ In addition to a model that only contains the list vote share at the previous election, three additional models include the three measures of district competitiveness. All models include party fixed effects.

Table 1 shows the results for the 2009 election. There is a consistently positive effect of the list vote share at the previous election on the party budget. The effect size is fairly large as each additional percentage

⁷ Given the contamination effects, pure list candidates are rather uncommon in German elections and they are less likely to win a mandate than candidates running a pure district candidacy or a dual candidacy (Manow, 2007), not least since pure list candidates tend to run on lower list positions.

⁸ A party-specific breakdown of the response rates in the four surveys is presented in Table A1 in the Appendix.

⁹ While knowing the universe of candidates enables us to correct for imbalances regarding party affiliation and candidate success, there is probably a remaining bias when the most prominent candidates are most likely to be missing from the data, such that we do not observe the highest individual campaign budgets.

¹⁰ Local campaign spending is a right-skewed variable, such that the majority of budgets are below the mean – both with regard to the grand mean, as well as regarding the party-specific means. One simple way to deal with this skew is to estimate models with transformed dependent variables. We discuss the models with untransformed dependent variables, as they enable a more direct interpretation of the effect sizes. As a robustness check, we re-estimated all models with logged dependent variables. All substantive interpretations remain unchanged.

Table 2

OLS regression: Party budget 2013 (in 1000 Euros).

	Model 5	Model 6	Model 7	Model 8
List vote share (t-1)	0.439*** (0.073)	0.367*** (0.077)	0.393*** (0.075)	0.403*** (0.074)
Distance to mandate (t-1)		-0.125** (0.044)		
Logged distance to mandate (t-1)			-1.453** (0.554)	
Distance to mandate >10 points (t-1)				-3.880** (1.206)
SPD	17.092*** (1.474)	16.775*** (1.468)	17.058*** (1.465)	17.360*** (1.463)
Grüne	13.272*** (2.075)	14.256*** (2.090)	14.192*** (2.093)	14.404*** (2.086)
FDP	6.358*** (1.832)	7.458*** (1.862)	7.445*** (1.869)	7.696*** (1.863)
Die Linke	6.493** (2.109)	7.468*** (2.123)	7.340*** (2.122)	7.453*** (2.112)
Constant	-8.960*** (2.560)	-5.035 (2.898)	-4.388 (3.085)	-9.787*** (2.550)
Observations	529	529	529	529
R2	0.335	0.345	0.343	0.348
Adjusted R2	0.328	0.337	0.336	0.340

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

point is associated with a predicted increase of roughly 200 Euros. By contrast, while all three measures of district competitiveness are plausibly signed, none are significantly different from zero. Substantively speaking, we have to conclude that parties did not spend significantly more on races where they had a reasonable shot at winning the mandate compared to races where a district win was a remote possibility. Notably, the effect size for the list vote share is virtually unaffected by the inclusion of the measures for district competitiveness. Moreover, the explained variance does not change between the models with and without the measures for district competitiveness, leading us to conclude that the voter potential was the main driver for parties' campaign expenditures in 2009.¹¹

Turning to the party fixed effects, we find that all parties exhibit a positive coefficient relative to the CDU/CSU baseline, but only strongly and significantly so for SPD candidates. The fact that CDU/CSU candidates consistently outspend candidates from all other parties despite lower party funds can be explained by their far greater success in attracting private donations and, to a lesser extent, by their greater willingness to spend personal funds on their campaigns. A greater access to private funds is reasonable, as CDU/CSU candidates are more likely to win district races than candidates from other parties, affording them and their donors a more likely political payoff from a donation.¹²

In order to get a sense of the magnitude of the estimates, we calculate the model prediction for an SPD candidate who runs in a competitive race in a district with an SPD list vote share of 30 percent at the previous

¹¹ To assess the possibility that parties' list vote shares have a non-linear effect on campaign spending, we estimated a series of models with higher-order polynomials for the list vote share. While none of the coefficients for the third-order or higher polynomials have any effect, there is a slight negative and statistically significant effect of the second-order polynomial in the model specifications for all four elections, suggesting that the effect of the voter potential is slightly diminishing at the highest list vote shares. However, the model fit statistics suggest that the model variants containing only the linear parameter for the list vote share perform nearly as well as the models including the squared term.

¹² The somewhat surprising observation that CDU/CSU candidates exhibit the lowest baseline estimate for access to party funds relative to all other parties in all model specifications can be partly explained by the fact that, on average, the CDU/CSU wins a higher list vote share than the other parties, such that part of the CDU/CSU effect is captured by the coefficient for the list vote share.

Table 3
OLS regression: Party budget 2017 (in 1000 Euros).

	Model 9	Model 10	Model 11	Model 12
List vote share (t-1)	0.438*** (0.084)	0.320*** (0.086)	0.329*** (0.080)	0.388*** (0.083)
Distance to mandate (t-1)		-0.202*** (0.044)		
Logged distance to mandate (t-1)			-4.583*** (0.566)	
Distance to mandate >10 points (t-1)				-6.264*** (1.564)
SPD	18.897*** (2.050)	17.236*** (2.041)	18.147*** (1.930)	18.220*** (2.027)
Grüne	14.919*** (3.169)	15.341*** (3.107)	16.903*** (2.990)	15.085*** (3.122)
FDP	12.023*** (3.427)	12.902*** (3.364)	14.143*** (3.234)	12.059*** (3.376)
Die Linke	9.446** (3.216)	9.711** (3.153)	12.213*** (3.033)	9.550** (3.169)
AfD	13.089*** (3.648)	13.775*** (3.579)	15.055*** (3.440)	13.105*** (3.594)
Constant	-9.884** (3.665)	-1.115 (4.063)	5.915 (3.961)	-9.679** (3.611)
Observations	503	503	503	503
R2	0.313	0.342	0.394	0.335
Adjusted R2	0.305	0.332	0.385	0.326

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

election based on model 4 in Table 1. The estimated budget is 16,458 Euros with a 95 % confidence interval between 14,336 and 18,579 Euros.¹³ While these figures do not incorporate the private share of the budget, they do highlight that district candidates are limited in their ability to run a professional campaign.

Starting with the 2013 election, the models change in several regards compared to 2009, as shown in Table 2. First, the list vote share at the previous election has an even stronger effect on the estimated party budget, ranging from roughly 400 Euros extra for each additional percentage point (2013 and 2017) to approximately 600 Euros in 2021. More importantly, starting in 2013, the district competitiveness has a systematic effect on the size of the party budgets. Whereas the distance to the mandate, as well as the logged distance to the mandate show the expected negative sign, a tight electoral race has a positive effect. All competitiveness indicators are significantly different from zero in all model specifications for the 2013, 2017, and 2021 elections, suggesting that parties have become more targeted in their campaign spending.

A third notable difference are the party fixed effects, which are all significantly higher than the CDU/CSU baseline in the latter three elections. While the magnitude of the party effects broadly reflects party sizes, where larger parties exhibit larger effects, there are exceptions to this rule. Possibly the most notable deviation is the Grüne effect in 2021, which is considerably larger than the SPD effect – and thus larger than the effect of all other parties – for the first time in the period of investigation. While it is difficult to speculate about the specific causes for this particular coefficient, it plausibly reflects a long-term trend in the

¹³ Although we include party fixed effects in all models, one might reasonably wonder whether the fixed effects are able to do away with all party-specific differences. For example, if the marginal utility of one additional Euro in campaign funding is greater for minor than for major parties, this difference would not be controlled for with party-fixed effects. To assess this possibility, we have z-standardized the dependent variable by party and re-estimated all models with the new dependent variable. The results are presented in Tables B9-B12 in the Appendix. While the results are largely unchanged, the downside of the z-standardized dependent variable is that the effects are no longer on a scale that is as easy to interpret as when analyzing the raw campaign funds.

Table 4
OLS regression: Party budget 2021 (in 1000 Euros).

	Model 13	Model 14	Model 15	Model 16
List vote share (t-1)	0.664*** (0.108)	0.482*** (0.120)	0.510*** (0.114)	0.597*** (0.111)
Distance to mandate (t-1)		-0.201*** (0.060)		
Logged distance to mandate (t-1)			-3.347*** (0.875)	
Distance to mandate >10 points (t-1)				-3.893* (1.618)
SPD	13.458*** (2.293)	11.650*** (2.333)	12.345*** (2.279)	12.854*** (2.295)
Grüne	20.195*** (3.276)	19.428*** (3.249)	20.227*** (3.22)	20.147*** (3.259)
FDP	7.990** (3.001)	7.842** (2.970)	8.560** (2.962)	8.166** (2.987)
Die Linke	7.549* (3.150)	6.797* (3.125)	7.419* (3.105)	7.350* (3.135)
AfD	5.887* (2.818)	5.231 (2.795)	6.084* (2.778)	6.018* (2.804)
Constant	-8.606* (3.819)	-0.023 (4.575)	4.015 (5.006)	-8.058* (3.806)
Observations	477	477	477	477
R2	0.257	0.274	0.279	0.266
Adjusted R2	0.247	0.263	0.269	0.255

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

German party system where the SPD has continued to lose votes, while Grüne have been on an upward trajectory. There is also a notable decrease in the size of the AfD coefficients between the 2017 and the 2021 models. This is likely due to the fact that the indicators for parties' general voter potential (list vote share) and the competitiveness of the electoral districts better capture the spending decisions of the AfD in 2021 than in 2017. After entering the federal parliament for the first time in 2017, the party had gained considerable voter support going into the 2021 election, making them viable competitors in many East German districts, such that the party likely focused their spending on districts they considered winnable.

To highlight the magnitude of the effects and the specific competitiveness effect on party budgets, we calculate two more model predictions for the 2021 models. Once again, predictions are made for SPD candidates in a district with an SPD list vote share of 30 percent, based on model 16 in Table 4 – one for candidates in tight races and one for candidates in uncompetitive races. Whereas the estimated party budget amounts to 26,589 Euros in tight races [95 % confidence interval: 23,141; 30,037], the estimated budget is 22,696 Euros otherwise [19,144; 26,248]. A difference of roughly 4000 Euros is substantial, given the overall magnitude of the prediction. With a difference of more than 6000 Euros, the gap is even more pronounced during the 2017 election (predictions based on Model 12 in Table 3), where an SPD candidate in a tight race is estimated to be provided with a party budget of 26,452 Euros [23,546; 29,358] and 20,188 Euros otherwise [17,962; 22,413].

6. Conclusion

What are the local campaign strategies of parties in mixed member systems? While a handful of contributions have studied how candidates react to the incentives of mixed systems in their individual campaigns (Bukow and Angenendt, 2019; Chiru, 2015; Zittel and Gschwend, 2008), we lack an understanding of where parties focus their efforts and how targeted these efforts are. To study these questions, we analyzed the party funds provided to the campaigns of German candidates over the course of four recent federal campaigns. Not only does the evidence shed light on local campaigning in non-majoritarian systems, it provides insights into the impact of the far-reaching political and institutional shifts in the German political system on local campaigning.

Using data from four candidate surveys, we have shown how electoral context impacts party spending, in that parties consistently spend more on districts where their voter potential is high. While this relationship was evident in all four elections, the probability of winning the nominal mandate has only become a relevant factor in more recent elections. It is only in the face of the shifting political and institutional context that parties have become more targeted in their campaign efforts.

While the observations are in line with expectations and have been remarkably consistent across all four elections, the analysis is not without limitations. One in particular bears repeating. Since candidates were only asked to indicate the overall share of their budgets that was provided by their respective parties, we do not know what share of the party funds stems from the local party organization as opposed to the state or the federal party. Local campaign funding is a challenge for the analysis as it might proxy the wealth of the local party rather than party strategy. The structure of the results suggests that this effect is not the driver of the findings. For one, there is considerable variation over time in parties' campaign budgets in the various districts, which we should not expect if campaign budgets were determined by the wealth of the local party organization, as this factor should be fairly stable between elections. Two, the effect of district competitiveness on campaign spending is difficult to explain with the wealth of the local party organization. It is unlikely that the most competitive districts would happen to fall into the districts with the best resourced local party organizations. This is especially true in the German case, where the most competitive districts are in East Germany, which is characterized by less resourced party organizations. Two factors help explain the wealth gap between East and West German parties. One, state party funding is conditional on votes received (Piccio, 2014). As turnout is generally lower in East Germany than in West Germany (Becker, 2004; Haußner and Kaeding, 2019), parties receive less state support. Two, except for AfD and Die Linke, membership figures are lower in the East than in the West (Niedermayer, 2022), such that most East German parties can expect fewer membership dues. Add to that the continued wage gap between East and West Germany (Kluge and Weber, 2018), which is relevant for income-dependent membership fees. Lastly, and mirroring membership figures, the four mainstream competitors also receive fewer donations in the East than in the West (Jacob and Pollex, 2023).

In developing the theoretical argument, we made explicit reference

to the German electoral system. Yet, while the account was presented for a particular electoral system, the general patterns should translate to other mixed systems. Unlike in majoritarian systems, winning a district is not paramount to achieve parliamentary representation in mixed systems, dampening the impact of district competitiveness on party spending, particularly for parties who stand little chance of winning districts. The extent to which the electoral context shapes parties' spending decisions should depend on the specifics of the electoral system, where a greater majoritarian component should result in more targeted spending on competitive districts, and vice versa. An obvious distinction in this regard is the contrast between mixed member majoritarian systems and mixed member proportional systems (Shugart and Wattenberg, 2001a), where the impact of the nominal tier on campaign spending should be greater in the former than in the latter.

The shifting political and institutional context of campaigning in Germany has resulted in an upward trend in campaign expenditures. More competitive races and a more diverse party system have increased uncertainty, leading all parties to spend more in order to have a shot at winning the district mandate and to benefit from the contamination effects between the district mandate and the list vote share (Hainmueller and Kern, 2008). While local campaign expenditures are still roughly comparable with other European countries (Benoit and Marsh, 2008; Pattie and Johnston, 2015), the most recent elections suggest that things might quickly spiral out of control. Unlike Germany (Nassmacher, 2006), a number of countries have introduced spending caps to combat such "arms race" tendencies and to level the electoral playing field (Fouirnaies, 2021). As the political and institutional context of German campaigning is unlikely to change anytime soon, let us conclude by suggesting that it may well be time for Germany to follow suit and finally introduce spending caps.

Credit author statement

All authors contributed equally.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Descriptive statistics

Table A1
Participation rates in GLES candidate surveys

	2009	2013	2017	2021
CDU/CSU	33.21	32.14	19.76	26.87
SPD	34.57	43.56	31.32	30.51
Grüne	47.20	46.45	46.11	55.41
FDP	39.42	39.39	35.97	36.41
Die Linke	39.41	45.48	36.90	40.45
AfD	–	35.46	27.58	15.52
Overall	38.04	39.88	31.60	32.54

Table A2
Descriptive statistics of dependent variable (Party budget in 1000 Euros)

Party	Year	Mean	Median	SD
CDU/CSU	2009	7.75	2.40	12.13
CDU/CSU	2013	5.17	2.05	8.01
CDU/CSU	2017	7.95	2.21	13.96
CDU/CSU	2021	12.31	8.00	16.47
SPD	2009	15.12	12.00	10.55
SPD	2013	17.84	15.81	11.46
SPD	2017	18.98	18.00	12.21
SPD	2021	17.68	15.10	11.37
Grüne	2009	5.10	3.00	5.58
Grüne	2013	8.58	5.11	13.43
Grüne	2017	8.26	5.94	10.73
Grüne	2021	16.43	10.93	16.36
FDP	2009	3.52	2.75	3.89
FDP	2013	3.60	2.00	4.55
FDP	2017	4.03	2.55	5.13
FDP	2021	6.42	4.20	7.24
Die Linke	2009	2.12	1.02	3.11
Die Linke	2013	1.84	1.00	2.51
Die Linke	2017	2.94	1.60	3.80
Die Linke	2021	4.57	2.00	6.21
AfD	2013	1.43	1.10	1.34
AfD	2017	4.42	2.00	6.60
AfD	2021	6.92	4.25	7.26

Appendix B. Additional results

Table B1
OLS regression: Party budget 2009 (in 1000 Euros); non-lagged IV

	Model 1	Model 2	Model 3	Model 4
List vote share (t)	0.297*** (0.059)	0.270*** (0.064)	0.291*** (0.062)	0.277*** (0.060)
Distance to mandate (t)		−0.040 (0.038)		
Logged distance to mandate (t)			−0.138 (0.455)	
Distance to mandate >10 points (t)				−1.689 (1.077)
SPD	10.892*** (1.307)	10.757*** (1.313)	10.880*** (1.308)	10.986*** (1.306)
Grüne	4.255* (1.725)	4.435* (1.733)	4.296* (1.732)	4.582** (1.735)
FDP	1.380 (1.548)	1.628 (1.565)	1.444 (1.563)	1.794 (1.568)
Die Linke	1.160 (1.728)	1.296 (1.733)	1.174 (1.731)	1.335 (1.730)
Constant	−2.194 (2.132)	−0.737 (2.534)	−1.694 (2.698)	−0.627 (2.351)
Observations	518	518	518	518
R2	0.306	0.307	0.306	0.309
Adjusted R2	0.299	0.299	0.298	0.301

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B2
OLS regression: Party budget 2013 (in 1000 Euros); non-lagged IV

	Model 1	Model 2	Model 3	Model 4
List vote share (t)	0.387*** (0.075)	0.334*** (0.076)	0.359*** (0.075)	0.381*** (0.075)
Distance to mandate (t)		−0.123** (0.039)		
Logged distance to mandate (t)			−1.571** (0.495)	
Distance to mandate >10 points (t)				−3.423* (1.339)
SPD	18.448*** (1.708)	18.162*** (1.696)	18.705*** (1.695)	18.834*** (1.706)

(continued on next page)

Table B2 (continued)

	Model 1	Model 2	Model 3	Model 4
Grüne	15.981*** (2.735)	17.416*** (2.751)	17.423*** (2.750)	17.110*** (2.757)
FDP	12.118*** (2.940)	13.719*** (2.960)	13.596*** (2.952)	13.255*** (2.958)
Die Linke	9.485*** (2.824)	10.934*** (2.839)	10.907*** (2.836)	10.603*** (2.843)
Constant	-10.251** (3.149)	-6.192 (3.382)	-5.678 (3.439)	-7.935* (3.261)
Observations	529	529	529	529
R2	0.324	0.336	0.337	0.332
Adjusted R2	0.317	0.329	0.329	0.324

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B3

OLS regression: Party budget 2017 (in 1000 Euros); non-lagged IV

	Model 1	Model 2	Model 3	Model 4
List vote share (t)	0.618*** (0.096)	0.492*** (0.101)	0.516*** (0.098)	0.574*** (0.096)
Distance to mandate (t)		-0.191*** (0.052)		
Logged distance to mandate (t)			-2.829*** (0.694)	
Distance to mandate >10 points (t)				-4.806** (1.456)
SPD	19.349*** (1.904)	18.532*** (1.893)	18.951*** (1.877)	19.782*** (1.890)
Grüne	14.766*** (2.689)	15.522*** (2.663)	15.830*** (2.660)	16.100*** (2.693)
FDP	9.155*** (2.535)	10.203*** (2.520)	10.483*** (2.517)	10.607*** (2.549)
Die Linke	9.203*** (2.720)	9.722*** (2.689)	10.001*** (2.685)	10.499*** (2.721)
AfD	9.671*** (2.742)	10.207*** (2.711)	10.692*** (2.711)	11.006*** (2.745)
Constant	-11.595*** (3.292)	-5.080 (3.700)	-2.033 (4.002)	-7.763* (3.460)
Observations	503	503	503	503
R2	0.331	0.349	0.353	0.346
Adjusted R2	0.323	0.340	0.344	0.337

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B4

OLS regression: Party budget 2021 (in 1000 Euros); non-lagged IV

	Model 1	Model 2	Model 3	Model 4
List vote share (t)	0.656*** (0.108)	0.492*** (0.125)	0.532*** (0.118)	0.593*** (0.116)
Distance to mandate (t)		-0.193** (0.074)		
Logged distance to mandate (t)			-1.676* (0.650)	
Distance to mandate >10 points (t)				-2.446 (1.572)
SPD	3.661* (1.778)	3.972* (1.771)	3.942* (1.770)	3.829* (1.778)
Grüne	10.205*** (2.198)	10.636*** (2.190)	10.820*** (2.197)	10.826*** (2.230)
FDP	1.201 (2.230)	2.237 (2.252)	2.010 (2.239)	1.918 (2.274)
Die Linke	4.112 (2.740)	4.708 (2.733)	4.259 (2.724)	4.343 (2.740)
AfD	1.412 (2.309)	2.037 (2.308)	1.799 (2.300)	1.876 (2.325)
Constant	-2.296 (2.924)	3.441 (3.649)	3.678 (3.716)	0.142 (3.313)
Observations	476	476	476	476
R2	0.256	0.267	0.267	0.260
Adjusted R2	0.247	0.256	0.256	0.249

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B5OLS regression: Party budget 2009 (in 1000 Euros); IVs based on zweitstimme.org

	Model 1	Model 2	Model 3	Model 4
List vote share (t)	0.248*** (0.057)	0.248*** (0.061)	0.227*** (0.058)	0.246*** (0.058)
Distance to mandate (t)		−0.000 (0.033)		
Logged distance to mandate (t)			−0.711 (0.425)	
Distance to mandate >10 points (t)				−0.270 (1.056)
SPD	8.906*** (1.167)	8.905*** (1.169)	8.975*** (1.166)	8.918*** (1.169)
Grüne	3.230 (1.717)	3.233 (1.739)	3.802* (1.748)	3.291 (1.735)
FDP	1.192 (1.652)	1.196 (1.676)	1.787 (1.687)	1.257 (1.673)
Die Linke	0.736 (1.826)	0.739 (1.845)	1.190 (1.843)	0.767 (1.832)
Constant	−0.752 (2.121)	−0.736 (2.412)	1.427 (2.485)	−0.519 (2.309)
Observations	518	518	518	518
R2	0.297	0.297	0.301	0.297
Adjusted R2	0.290	0.289	0.293	0.289

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B6OLS regression: Party budget 2013 (in 1000 Euros); IVs based on zweitstimme.org

	Model 1	Model 2	Model 3	Model 4
List vote share (t)	0.466*** (0.079)	0.396*** (0.081)	0.432*** (0.080)	0.443*** (0.079)
Distance to mandate (t)		−0.142*** (0.041)		
Logged distance to mandate (t)			−1.630** (0.567)	
Distance to mandate >10 points (t)				−3.518** (1.232)
SPD	17.987*** (1.565)	17.644*** (1.552)	18.078*** (1.554)	18.251*** (1.557)
Grüne	13.831*** (2.172)	14.881*** (2.171)	15.013*** (2.196)	14.963*** (2.193)
FDP	10.962*** (2.477)	12.437*** (2.491)	12.323*** (2.505)	12.097*** (2.492)
Die Linke	9.540*** (2.561)	10.982*** (2.569)	10.819*** (2.582)	10.616*** (2.571)
Constant	−10.853*** (2.897)	−6.451* (3.139)	−6.044 (3.328)	−8.297** (3.014)
Observations	529	529	529	529
R2	0.333	0.348	0.344	0.344
Adjusted R2	0.327	0.341	0.336	0.336

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B7OLS regression: Party budget 2017 (in 1000 Euros); IVs based on zweitstimme.org

	Model 1	Model 2	Model 3	Model 4
List vote share (t)	0.462*** (0.089)	0.308*** (0.092)	0.338*** (0.086)	0.406*** (0.089)
Distance to mandate (t)		−0.230*** (0.047)		
Logged distance to mandate (t)			−4.079*** (0.574)	
Distance to mandate >10 points (t)				−6.262*** (1.603)
SPD	18.396*** (1.990)	16.598*** (1.981)	17.535*** (1.901)	17.856*** (1.967)
Grüne	14.581*** (3.124)	14.682*** (3.055)	15.645*** (2.983)	14.751*** (3.081)
FDP	9.344** (2.987)	9.546** (2.921)	10.582*** (2.854)	9.610** (2.946)
Die Linke	8.647** (3.095)	8.515** (3.027)	9.525** (2.954)	8.764** (3.052)

(continued on next page)

Table B7 (continued)

	Model 1	Model 2	Model 3	Model 4
AfD	10.613** (3.266)	10.575*** (3.194)	11.666*** (3.118)	10.834*** (3.220)
Constant	−9.447** (3.603)	0.624 (4.085)	5.306 (4.014)	−2.931 (3.924)
Observations	503	503	503	503
R2	0.313	0.344	0.377	0.334
Adjusted R2	0.305	0.335	0.368	0.324

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B8

OLS regression: Party budget 2021 (in 1000 Euros); IVs based on [zweitstimme.org](https://www.zweitstimme.org)

	Model 1	Model 2	Model 3	Model 4
List vote share (t)	0.852*** (0.116)	0.703*** (0.132)	0.713*** (0.124)	0.798*** (0.119)
Distance to mandate (t)		−0.165* (0.071)		
Logged distance to mandate (t)			−2.778** (0.932)	
Distance to mandate >10 points (t)				−2.963 (1.577)
SPD	15.098*** (2.263)	14.094*** (2.293)	14.745*** (2.248)	15.164*** (2.257)
Grüne	12.874*** (2.265)	12.495*** (2.261)	13.189*** (2.249)	13.606*** (2.293)
FDP	7.753** (2.654)	7.587** (2.643)	8.322** (2.639)	8.356** (2.667)
Die Linke	10.261*** (3.094)	9.803** (3.086)	10.321*** (3.069)	10.473*** (3.088)
AfD	8.005** (2.745)	7.576** (2.739)	8.199** (2.723)	8.336** (2.744)
Constant	−10.916** (3.566)	−4.801 (4.414)	−0.970 (4.862)	−7.947* (3.891)
Observations	477	477	477	477
R2	0.280	0.288	0.293	0.285
Adjusted R2	0.271	0.277	0.283	0.274

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B9

OLS regression: z-standardized party budget 2009 (by party)

	Model 1	Model 2	Model 3	Model 4
List vote share (t−1)	0.034*** (0.008)	0.029*** (0.008)	0.032*** (0.008)	0.033*** (0.008)
Distance to mandate (t−1)		−0.010* (0.005)		
Logged distance to mandate (t−1)			−0.119 (0.065)	
Distance to mandate >10 points (t−1)				−0.240 (0.152)
SPD	0.076 (0.155)	0.092 (0.154)	0.098 (0.155)	0.120 (0.157)
Grüne	0.904*** (0.248)	1.069*** (0.261)	1.042*** (0.259)	1.024*** (0.259)
FDP	0.841*** (0.239)	1.018*** (0.255)	0.984*** (0.251)	0.961*** (0.251)
Die Linke	0.923*** (0.256)	1.072*** (0.267)	1.046*** (0.264)	1.035*** (0.266)
Constant	−1.140*** (0.284)	−0.861** (0.316)	−0.817* (0.333)	−1.016*** (0.294)
Observations	485	485	485	485
R2	0.041	0.049	0.047	0.046
Adjusted R2	0.031	0.037	0.035	0.034

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B10

OLS regression: z-standardized party budget 2013 (by party)

	Model 1	Model 2	Model 3	Model 4
List vote share (t-1)	0.054*** (0.008)	0.044*** (0.008)	0.048*** (0.008)	0.050*** (0.008)
Distance to mandate (t-1)		-0.017*** (0.005)		
Logged distance to mandate (t-1)			-0.193** (0.060)	
Distance to mandate >10 points (t-1)				-0.448*** (0.131)
SPD	0.552*** (0.160)	0.508** (0.159)	0.548*** (0.159)	0.583*** (0.159)
Grüne	1.212*** (0.226)	1.349*** (0.226)	1.335*** (0.227)	1.343*** (0.227)
FDP	0.989*** (0.199)	1.142*** (0.201)	1.134*** (0.203)	1.144*** (0.202)
Die Linke	1.205*** (0.229)	1.340*** (0.230)	1.317*** (0.230)	1.315*** (0.229)
Constant	-1.748*** (0.278)	-1.203*** (0.314)	-1.139*** (0.334)	-1.395*** (0.294)
Observations	529	529	529	529
R2	0.081	0.103	0.099	0.101
Adjusted R2	0.072	0.093	0.088	0.090

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B11

OLS regression: z-standardized party budget 2017 (by party)

	Model 1	Model 2	Model 3	Model 4
List vote share (t-1)	0.056*** (0.009)	0.045*** (0.009)	0.048*** (0.009)	0.053*** (0.009)
Distance to mandate (t-1)		-0.019*** (0.005)		
Logged distance to mandate (t-1)			-0.346*** (0.061)	
Distance to mandate >10 points (t-1)				-0.392* (0.166)
SPD	0.976*** (0.215)	0.822*** (0.215)	0.920*** (0.209)	0.934*** (0.215)
Grüne	1.863*** (0.332)	1.902*** (0.327)	2.012*** (0.324)	1.873*** (0.331)
FDP	2.063*** (0.359)	2.144*** (0.355)	2.223*** (0.350)	2.065*** (0.358)
Die Linke	1.868*** (0.337)	1.892*** (0.332)	2.001*** (0.328)	1.874*** (0.336)
AfD	2.152*** (0.383)	2.215*** (0.377)	2.300*** (0.372)	2.153*** (0.381)
Constant	-2.290*** (0.384)	-1.476*** (0.428)	-1.098* (0.429)	-1.884*** (0.419)
Observations	503	503	503	503
R2	0.076	0.106	0.132	0.087
Adjusted R2	0.065	0.094	0.120	0.074

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Table B12

OLS regression: z-standardized party budget 2021 (by party)

	Model 1	Model 2	Model 3	Model 4
List vote share (t-1)	0.071*** (0.009)	0.053*** (0.010)	0.057*** (0.010)	0.065*** (0.010)
Distance to mandate (t-1)		-0.019*** (0.005)		
Logged distance to mandate (t-1)			-0.290*** (0.076)	
Distance to mandate >10 points (t-1)				-0.337* (0.140)
SPD	0.905*** (0.198)	0.733*** (0.201)	0.809*** (0.197)	0.853*** (0.199)
Grüne	1.720*** (0.284)	1.647*** (0.281)	1.723*** (0.280)	1.716*** (0.282)
FDP	1.528*** (0.260)	1.514*** (0.256)	1.577*** (0.256)	1.543*** (0.259)

(continued on next page)

Table B12 (continued)

	Model 1	Model 2	Model 3	Model 4
Die Linke	1.701*** (0.273)	1.629*** (0.270)	1.690*** (0.269)	1.684*** (0.271)
AfD	1.207*** (0.244)	1.144*** (0.241)	1.224*** (0.241)	1.218*** (0.243)
Constant	−2.276*** (0.331)	−1.459*** (0.395)	−1.183** (0.433)	−1.891*** (0.366)
Observations	477	477	477	477
R2	0.117	0.142	0.144	0.128
Adjusted R2	0.106	0.129	0.131	0.115

Note: Standard errors in parentheses. Reference category for party: CDU/CSU. ***p < 0.001, **p < 0.01, *p < 0.05.

Data availability

The authors do not have permission to share data.

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