

Voter Fatigue and Turnout

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Abstract:

In this study, I examine the effect of the temporal distance between elections on voter turnout. My hypothesis is that temporally close elections demotivate voters in terms of turning out to vote. I exploit a natural experiment in the German state of Hesse, where voters from different municipalities faced the same electoral contest but had different temporal distances with regard to the most recent election, due to the staggered timing of some local elections. I found that in cases where another election happened soon before the studied contest, voter turnout was significantly reduced. This effect is stronger when the election is deemed less important in the eyes of the voters. Moreover, it was found that the demotivating effect ameliorates after approximately six months. Policy recommendations that stem from the findings are either to hold concurrent elections or to allow sufficient time between any two elections.

Key words: Electoral Turnout, Voter Motivation, Behavioral Political Economy, Choice Fatigue, Contextual Inference

JEL classifications: D70, D72, C23

1. Introduction

Political decentralization implies a high “electoral burden” on voters. For example, in a federal country such as Germany, in principle, a citizen could be called to the voting booth nine times within a single year.¹ Such a flood of elections can also be seen in many other countries that are politically decentralized, which is common to Western democracies. In Switzerland and the United States, for example, the high number of elections has even been considered directly responsible for persistently low voter turnout (e.g., Boyd, 1981, 1989; Jackman and Miller, 1995; Franklin, 2001).

A question that emerges is whether citizens could become “tired” of voting, a phenomenon that in the following will be termed “voter fatigue”. Does voter turnout decrease if elections occur too frequently? Surprisingly, while many studies argue that voter fatigue plays an important role in explaining low voter turnout (e.g., Boyd, 1981, 1986, 1989; Jackman and Miller, 1995; Rallings et al., 2003), this explanation has not yet been studied empirically in a convincing setting.² The current study aims to fill this research gap by investigating in a quasi-experimental design whether the time that has passed since the most recent election influences turnout in the present election. If voter fatigue indeed exists, then one would expect that the larger the amount of time that passes (here-

¹ There could be an election for each of the federal parliament, state parliament, European parliament, county council, local municipal council, county executive (*Landrat*), and head of the local public administration (such as mayor or city manager). As the last two of these elections are in most German states organized in the form of a run-off election, this could imply two possible votes for each of these two institutions. There could be even more than nine elections—if, for example, one of the parliaments is elected twice within a single year because it triggered early elections. It is important to note that having many elections in a single year is not merely a theoretical possibility; it has indeed happened. For example, seven elections occurred within a single year in the state of North-Rhine Westphalia, in the June 2009–May 2010 period.

² The estimation approach of Rallings et al. (2003) shows some similarities to the approach taken in the current study. However, the estimation approaches also differ in important ways. Most importantly, Rallings et al. (2003) do not use panel data methods, and they focus on local elections; as such, many potentially important variables differ across jurisdictions and cannot be filtered out as they are with my approach.

after, “temporal distance”) to the most recent election, the larger the electoral turnout would be at the present election, all else being equal. On the other hand, one could argue that a greater number of elections makes voters more interested in politics; if this were true, a small temporal distance between elections would actually increase turnout.

To investigate whether and how the temporal distance between two elections influences turnout, one would ideally like to run a field experiment in which one randomly assigns voters to different last-scheduled elections. As this is infeasible, in my identification strategy, I make use of a natural experiment setting occurring in municipalities of the German state of Hesse. Specifically, while elections to most institutions (such as the German federal parliament, the European parliament, or Hesse’s state government) are scheduled at a uniform date across Hesse’s municipalities, this is not the case for some local elections (e.g., *Bürgermeister* and *Landrat* elections) that, for historical reasons, take place on staggered dates across Hesse’s municipalities and counties. Thus, in elections with uniform dates across municipalities, voters in different municipalities will face the same contest on the same date, but experience the most recent election on different dates. This allows me to control for election-specific effects that could affect voter behavior, such as expected closeness, saliency, or the stakes involved. Furthermore, since I use a large panel dataset of all 426 municipalities in Hesse that covers all elections with uniform election dates over the 1994–2014 period, I am able to control for municipality-specific, time-invariant factors that might affect voter turnout.

A concern that could nonetheless remain is that there may be idiosyncratic, time-variant variables that correlate with both the timing of the *Bürgermeister* and *Landrat* elections and with turnout. Most plausibly, this could happen through the strategic scheduling of

these elections by municipalities and counties. However, I provide numerous arguments and additional results that are inconsistent with such remaining omitted variables bias and which support the exogeneity of my main explanatory variable. Most importantly, I check the robustness of the results by using only a time period in which municipalities were not able to schedule elections—in which this, rather, was the task of the supervisory authority (*Kommunalaufsicht*). Doing so excludes the possibility of self-selection into different days since the most recent election.

My main finding is that the closer in time an election is to the most recent one, the lower its turnout will be. This effect is highly significant and extremely robust. It is visible in the raw data, does not change quantitatively or qualitatively when common control variables are included, and persists (even at larger magnitudes) when only the time period with exogenous *Bürgermeister* and *Landrat* elections is considered. Quantitatively, my results suggest that one additional day between two elections increases turnout at the later election by approximately 0.0016 percentage points—that is to say, if there were a temporal distance of one year between two elections, this would increase turnout at the later election by 0.584 percentage points, *ceteris paribus*. I also find that this effect differs considerably across election types. For example, a one-year time span to the most recent election would imply that turnout for an election to the European parliament—which, as will be discussed in section 2, typically has the lowest turnout in Germany—is more than 2 percentage points larger. In contrast, for federal elections, voter fatigue does not play any role. Furthermore, I investigate the persistence of the voter fatigue effect, and find that it fades approximately six months after an election.

Because voter fatigue might explain why countries with high political decentralization and frequent contests—such as the United States and Switzerland—have typically low voter turnout, the present study contributes to the very scarce literature on how election timing causally influences turnout (e.g., Anzia, 2012; Garmann, 2015). This paucity of research on election timing is surprising, as elections constitute probably one of the most studied institutions in economics and political science (Berry and Gersen, 2011). Moreover, the current study can be categorized as part of an emerging body of literature termed “behavioral political economy” (see Schnellenbach and Schubert [2015] for a recent survey), as it shows that contextual variables (i.e., days since the most recent election, and the number of elections in the recent past [used in robustness checks]) can influence turnout decisions. While context, by determining instrumental motivation, could be an important driver of voter turnout (Franklin, 2001), it has mostly been neglected in the existing literature.³

Finally, this study also relates to a more general body of literature on the behavioral determinants of (sequential) decision-making. Specifically, recent studies have investigated how choice fatigue and choice overload influence decision-making. For example, by undertaking laboratory and field experiments, Iyengar and Kamenica (2010) investigated how the size of a choice set influences the outcomes of decision-making processes. Rather than focus on the outcome of the decision-making process, Iyengar and Lepper (2000) focused on the effect of the size of a choice set on the decision whether to decide. They found that larger choice sets can lead decision-makers to abstain from making a decision. Most closely related to my study, Augenblick and Nicholson (2012) pro-

³ For related research that shows that context matters for voting decisions, see Berger et al. (2008), who show that the location of voting influences election outcomes.

vide evidence in the voting context that more decisions on the same ballot can increase abstention and reliance on decision shortcuts, such as voting for the status quo. This existing literature on choice fatigue, however, examines how (the number of) choices made in the immediate past can affect recent decisions. The current study contributes to the literature by showing that, in the context of voting, choice fatigue can even persist over a longer-term period of several months.

This paper is organized as follows. Section 2 presents the institutional setting and discusses the various elections that take place in Germany. In section 3, I explain the empirical strategy of this study. Section 4 discusses the main results, and section 5 explores their robustness. Finally, section 6 concludes.

2. Institutional Setting and Voter Turnout in Hesse

2.1 Institutional Setting and Data

In Germany, there are four layers of government: the federal government, the 16 German states (including Hesse), the (to date) 402 counties (of which 26 are located in Hesse), and the (to date) 11,197 municipalities (of which 426 are located in Hesse). Elections are held for each layer of government. Furthermore, German voters also have the opportunity to cast a vote at elections for the European parliament. Importantly, all of these elections are typically held on different dates. Thus, as mentioned in the introduction, in some years, any one jurisdiction can experience a multitude of elections.

The European parliament is elected every five years on the same election date across all German municipalities via a proportional election system, in which the entire country of Germany constitutes a single electoral district. The German federal parliament is elected

every four years. However, elections can be held earlier, in some extraordinary circumstances; this happened in 2005, for example, when the ruling social–democratic party (SPD) triggered early elections. All German municipalities vote for the federal parliament on the same day. Unlike the European parliament, the German federal parliament is elected via a mixed-member proportional election system where voters elect both a district representative and a party list. The party list generally determines the number of parliamentary seats that the parties acquire, and it can thus be considered more important. In section 5, where I discuss the robustness checks, I also discuss the relevance of the existence of a mixed-member proportional election system to my identification strategy. A mixed-member proportional election system is also in place for elections for Hesse’s state parliament, which is typically elected by Hesse’s citizens every five years.⁴ However, again, elections can be held earlier, in extraordinary circumstances; this happened in 2009, for example. Again, all of Hesse’s municipalities hold state parliament elections on the same date.

At the county level, there are elections for two political institutions.⁵ First, there are elections to the county parliament (*Kreistag*), which is elected via a proportional election system and for which an entire county forms one electoral district. The date for a county parliament election is uniform across all municipalities. Second, there are elections to the head of the county executive (*Landrat*), where a single politician is elected in a run-off election. In this run-off election, a politician can be elected in the first round if he or she receives more than 50% of the votes. If no candidate crosses this threshold,

⁴ Before 2003, the legislative term had a length of four years.

⁵ The five largest cities in Hesse also have a county status (*kreisfreie Städte*). Thus, for these cities, the county and municipality levels coincide, and neither a county parliament nor a county executive exists. However, this is not problematic with regards to my empirical research design. Moreover, the results would remain completely unchanged if these observations were excluded from the study.

the top two candidates from the first round advance to a second round. The *Landrat* elections are held concurrently in all municipalities within a county, but on different dates across counties. Thus, the municipalities of different counties generally elect their *Landrat* on different dates.

Analogously, at the municipality level, two institutions are elected. The municipal council, as the local legislature, is elected on uniform election dates across Hesse's municipalities. These municipal council elections are held on the same day and at the same voting stations as the county council elections. Thus, in the following, I will refer to the joint election of municipal and county councils as "local council elections." Moreover, the municipal council is also elected via a proportional election system, in which the whole of a municipality constitutes one electoral district. As the second municipal institution, citizens in Hesse elect the head of the public administration of each municipality (*Bürgermeister*). The *Bürgermeister* election dates differ across municipalities. The *Bürgermeister* is elected in the same type of run-off election as the *Landrat*. Importantly, the dates of the *Bürgermeister* and *Landrat* elections need not coincide. In most cases (94.28%, in the study period), they are scheduled for different dates.

For this study, I compile a large panel dataset covering all 426 municipalities in Hesse that were observed for all elections with uniform election dates in the 1994–2014 period.⁶ My dataset, which is drawn from the Statistical Office of Hesse, combines turnout

⁶ Note that it does not make sense to employ a time period before 1994, as the staggered *Bürgermeister* and *Landrat* elections were introduced in 1993. In other words, the European election in 1994 was the first election for which the number of days since the most recent election differed across municipalities. On a related note, in many German states other than Hesse, staggered local elections do not occur regularly; instead, personal elections such as *Bürgermeister* and *Landrat* elections generally occur simultaneously across all municipalities (e.g., through a combination of these elections with local council elections). In such a case, trivially, my identification strategy would not work, because it would not be possible to dis-

data with political, economic, and socio-demographic data from each municipality. Summary statistics for the main variables used in this study can be found in Table 1. The main outcome variable is turnout, in percentage points; this is measured as the number of votes (valid and invalid) divided by the number of eligible voters (and multiplied by 100).⁷ Part (a) of Figure 1 shows a histogram of this outcome variable. In this histogram, turnout appears to be quite left-skewed. Furthermore, a problem with this outcome variable could be that it is bounded and can only assume a value between 0 and 100. A simple linear model applied to a bounded variable can cause problems similar to those seen when a linear model is applied to a binary variable (Wooldridge, 2002). Therefore, in robustness checks, I also consider the transformed outcome variable

$$Turnout_transformed = \ln\left(\frac{Turnout}{100 - Turnout}\right) \quad (\text{Geys, 2006; Aguiar-Conraria and}$$

Magalhães, 2010). As part (b) of Figure 1 shows, this transformation is neither left-skewed nor bounded.

2.2 Voter Turnout in Hesse

In general, electoral turnout in Germany and in Hesse in particular is, compared to some other Western democracies, relatively high. However, there are remarkable differences in terms of electoral turnout across government layers. Moreover, at all government layers, turnout has considerably decreased in recent decades, making the encouragement of voter turnout an issue of public debate in Germany. Turnout at federal elections has been highest among the election types studied here; in my sample of Hesse, it was high-

entangle general election-specific effects from days until the most recent election. These circumstances – together with the availability of a time period with exogenous staggered elections – explain my focus on Hesse during this period.

⁷ Alternatively, as invalid votes and abstention have the same effects vis-à-vis final election results, one might define turnout as the ratio of the number of all valid votes to the number of eligible voters. All results in this study are robust to the use of this alternative definition.

er than 80% in the beginning of my investigation period and at least slightly higher than 70% for the most recent federal election (2013). Second, during the study period, Hesse's state elections have always received turnout levels in excess of 60%. The local council elections in Hesse saw a severe drop in voter turnout over the period studied herein: while turnout was greater than 70% in 1997 and thus higher than for some state elections, it has only attracted approximately 45% of all eligible voters in more recent times. Finally, European elections have consistently scored lowest in terms of turnout. While turnout was already low at the beginning of the investigation period (56.41% in 1994), it became even lower than 40% in 2004 and 2009. In the most recent European election (2014), turnout was at approximately the 42% level.

While I use turnout levels for those elections discussed above as benchmarks of how important these elections are in the eyes of voters, for informational purposes, I briefly also report here the typical turnout levels for the staggered elections. The *Bürgermeister* elections saw, at the beginning of my study period, average turnout levels exceeding 65%. At the end of my study period, however, the average turnout was at least as high as 55%. Thus, while *Bürgermeister* elections are not as important as federal elections, they can be seen as being at least as important as local and state elections, and clearly more important than European elections. In contrast, turnout levels suggest that voters consider *Landrat* elections relatively unimportant: their turnout levels can be considered as most closely resembling those of European elections (i.e., average turnout of 46.8% at the beginning of the study period, and 38.9% near the end).

3. Empirical Strategy

3.1 Natural Experiment

Turnout is likely influenced by a multitude of factors, such as candidate quality (de Benedetto and de Paola, 2014), the stakes involved in the election (Andersen et al., 2014), and the mobilization efforts of political parties. Some factors might be relatively easy to measure and control for, while many others may be difficult to measure or barely observable. Omitted variable bias is thus a serious estimation challenge. A prime example is the *expected* closeness of the election results, from the voters' viewpoint—something that is, according to the standard calculus of voting (Downs, 1957; Dhillon and Peralta, 2002), an important determinant of turnout, but in general is unobservable to the econometrician in real-world elections (Duffy and Tavits, 2008; Garmann, 2014). My empirical approach allows for the control of such contest-specific but unobservable determinants of turnout.

For all these reasons, I make use of a natural experiment that is generated by the existence of staggered timing of some local elections in the German state of Hesse. Specifically, there exist both staggered elections as well as those with a uniform date across municipalities. For elections that are held at uniform dates across municipalities, all contest-level factors that influence turnout—such as expected closeness, popularity of candidates, the stakes involved, or general time and seasonal effects—are equal for all voters,⁸ and can thus be filtered out. For example, the expected closeness in a national election is not determined at the municipality level in Hesse, but at the federal level.

⁸ This is not completely true for local council elections, as (for example) expected closeness likely differs across municipalities. However, the results of this study change neither quantitatively nor qualitatively when these observations are excluded. Because in view of the discussion in section 2 the study of local elections and comparisons between them and other elections are interesting endeavors, I do not exclude these observations from the baseline analysis.

Therefore, I focus on those elections that are held at uniform dates—namely, the election to the European parliament, the federal election, the elections to Hesse’s state parliament, and the local council elections—to filter out any potential contest-level omitted variable. Table 2 lists the elections examined within this study. While all voters face the same contest in these elections, the treatment—that is to say, the number of days since the most recent election—differs across municipalities, due to the staggered timing of some local elections (as explained above). To illustrate my empirical strategy, consider the simple example shown in Figure 2. As one can see, all of Hesse’s municipalities voted for Hesse’s state parliament in January 2009. The next election with uniform election dates was the election to the European parliament, on June 7, 2009; however, some municipalities had an election between these two dates. For example, in Niedenstein—a small municipality with approximately 5,000 inhabitants, located in the county of Schwalm-Eder—*Bürgermeister* elections were held on March 22, 2009.⁹ Thus, as of June 7, 2009, less than three months had passed before the citizens of Niedenstein voted in another election.

Moreover, the 23 municipalities of the county Darmstadt-Dieburg elected their *Landrat* on April 26, 2009. Hence, the residents of these municipalities, when they went to the polls in June 2009, had had an election less than eight weeks previous. Thus, only for those municipalities that did not vote between January and June 2009 had approximately five months passed since their most recent election. It is this variation in exposure to the most recent elections that I will use to estimate the effect of voter fatigue on turnout.

⁹ Many other municipalities held *Bürgermeister* elections between January and June 2009. I concentrate solely on Niedenstein, for illustrational purposes.

The histogram in Figure 3 shows the distribution of the number of days since the most recent election. As becomes clear from part (a), there is a large amount of variation in my treatment variable: elections can be as close together as seven days (this has happened seven times) or as far apart as more than 900 days (i.e., approximately 2.5 years). Part (b) of Figure 3 shows in greater detail the days since the most recent election for the arguably most important parts of the distribution: those elections that were closest in temporal distance to the previous one. (I here choose a maximum of 100 days since the most recent election.) As can be seen, short times between elections do not happen infrequently; for example, for the interval of 0–30 days, there are 178 observations.¹⁰

Formally, I estimate the following model:

$$Turnout_{it} = \alpha_i + \beta Days_{it} + Election_t + u_{it} , \quad (1)$$

where $Turnout_{it}$ denotes the turnout in municipality i and election at time t . α_i is a municipality fixed effect that captures the time-invariant characteristics of municipality i , and $Election_t$ is an election fixed effect that captures contest-specific factors common to all municipalities, as explained above. Of course, year fixed effects are nested within the election fixed effects. u_{it} is an error term clustered at the municipality level. Furthermore, a vector of time-variant control variables can be included in the model in a straightforward way, as will be further detailed below. Finally, the main variable of interest is $Days_{it}$, which denotes the days since the most recent election. A positive coefficient would indicate that temporally close elections lead to lower turnout. Note, particularly with regard to the endogeneity discussion in the next section, that due to the inclu-

¹⁰ The “holes” in the distribution stem from a simple feature of the German election system: elections must be held either on a Sunday or on an official holiday. Thus, the variable “days since the most recent election” mostly takes values that are multiples of 7.

sion of municipality fixed effects, identification stems from within-municipality changes in the variable $Days_{it}$.

3.2 Endogeneity

Although the design used here clears out omitted variables to a large extent, there could still be omitted variable bias if there were omitted variables that are idiosyncratic to a single municipality (i.e., not contest-specific) and correlate with both turnout and $Days_{it}$. This could happen if municipalities self-select into different days since the most recent election based on unobservable, time-variant municipality-specific characteristics. As the dates of the elections shown in Table 2 (i.e., those used in the estimations) are scheduled by higher tiers of government (and are therefore not under the control of the municipalities), municipalities would need to strategically schedule the *Bürgermeister* and *Landrat* elections to influence $Days_{it}$. While the *Landrat* elections are scheduled by the county—and their dates are thus unlikely to be influenced by a single municipality—a potential concern could arise if municipalities were able to strategically time their *Bürgermeister* elections.

For example, an incumbent *Bürgermeister* who would benefit from high turnout might try to schedule the *Bürgermeister* election to be concurrent with major national elections, if he or she fears that the turnout under other circumstances would be low; he or she would do this because concurrent elections are associated with higher turnout (Anzia, 2011; Garmann, 2015).¹¹ This could be the case in municipalities with low civic

¹¹ Note that in the 1999–2014 period, the municipal council could decide on the timing of elections. Thus, for this scenario to occur, the *Bürgermeister* would need to have good ties to the council—something that would be unlikely, if there were a divided government.

engagement. In this case, $Days_{it}$ would likely be relatively large, because no *Bürgermeister* election would have been held since the most recent statewide election. However, if such an explanation were true, the coefficient of interest would likely be downwardly biased, and my conclusions too conservative, because civic engagement—the omitted variable—would correlate positively with turnout and negatively with $Days_{it}$.

For the following reasons, I do not regard the timing of elections by municipalities as a large concern vis-à-vis my identification strategy. For such issues to be a concern, self-selection would need to have been consistently applied: in other words, municipalities with specific characteristics would need to be in a position to frequently schedule *Bürgermeister* elections so as to be shortly before, concurrent with, or shortly after one of the elections listed in Table 2. Such circumstances, however, are very unlikely. The *Bürgermeister* term length is six years (i.e., municipalities are legally obliged to hold *Bürgermeister* elections every six years). There are two scenarios under which there would be earlier elections. First, the *Bürgermeister* could be voted out of office. However, the hurdles¹² for such a procedure in Hesse are very high (Fuchs, 2007); this is why it has only happened seven times thus far. Second, early elections can occur if the *Bürgermeister* steps down before his or her term ends. However, if the *Bürgermeister* does so, he or she will lose all pension entitlements if not re-elected in the upcoming election. This represents a significant monetary loss.

Overall, because neither of these two options is really attractive, early elections have occurred in fewer than 15% of the cases; only a small minority of these (i.e., fewer than

¹² First, the municipal council must decide with a two-thirds majority that such an election should take place. Second, the voters must decide with an absolute majority that the *Bürgermeister* should be turned out of office. Moreover, this absolute majority must represent at least 30% of all eligible voters.

25%) have been combined with one of those elections listed in Table 2 (i.e., in total, fewer than 3.5% of all elections are affected). Thus, the benefits that stem from presumably higher turnout have not been a major motivator of early elections. Instead, political reasons have most likely led to early elections. Therefore, for the average municipality in the sample, the strategic timing of elections was, if at all, merely possible in only a very few cases. Consistent self-selection into different numbers of days since the most recent elections was, in most cases, impossible.

Nonetheless, to address remaining potential endogeneity concerns, I undertake additional analyses, all of which garner results inconsistent with the presence of endogeneity. First, due to the availability of panel data, I can include municipality fixed effects that capture the time-invariant characteristics of each municipality. Many potential determinants of turnout—such as civic engagement or political interest within a municipality—could plausibly be time-invariant. The inclusion of fixed effects therefore reduces even further potential concerns about omitted variables. Importantly, all the results that I generate over the entire 20-year period also hold for shorter periods, in which variables are arguably less likely to be time-variant.

Second, I control for various (time-variant) municipality-specific characteristics that likely influence turnout. In particular, I control for socio-demographic variables such as population size, the number of eligible voters, population density, share of foreigners, the age structure of the population (proportion of people aged below 15 and above 65), and the proportion of the female population. Moreover, I control for real GDP per capita

to capture the influence of income on turnout.¹³ All these variables are measured at the beginning of each year and are therefore predetermined with regard to turnout for the studied contest. To capture political influence, I proxy for the political ideology in the municipality with the vote share of the four major political parties (Christian Democratic Union[CDU], SPD, Greens, and Free Democratic Party[FDP]) at the *most recent* municipal council election. In other words, these variables are also determined before the studied contest, in order to preclude posttreatment bias. Moreover, I control for political competition in the municipality (again, measured after the most recent municipal council election). A proxy for political competition is calculated as the inverse of the Herfindahl index of the sum of squared seat shares of all parties in the municipal council. Furthermore, I include the number of municipality-specific voter associations that listed candidates for the most recent municipal council election; this can serve as a proxy for political interest. Finally, I include a dummy variable for whether any other election was held on the date of the studied contest, as concurrent elections are associated with higher turnout. (Concurrent elections occurred in fewer than 10% of all cases.)

The thinking behind the inclusion of these control variables is that the magnitude of a potential bias within the estimates on account of omitted variables can be assessed by comparing estimates with control variables to those without (Altonji et al., 2005; Andersen et al., 2014). If I were to include observable variables that are presumably important to voter turnout, and if this inclusion does not change the magnitude of the estimates, it will provide strong evidence against the possibility that unobservable variables

¹³ Note that GDP data are available only at the county level (Foremny and Riedel, 2014). In robustness checks, I also include the wage level of a county (Charles and Stephens, 2013) as well as the unemployment rate at the municipality level (Hodler et al., 2015), neither of which is available for the entire study period.

would bias the estimates to any significant extent. Indeed, I find the estimates to remain completely unchanged if a large number of observable variables is included, and this leads me to conclude that my empirical design successfully filters out omitted variables.

Third, I will provide suggestive evidence that $Days_{it}$ is driven by practical rather than strategic considerations. I do so by investigating which observable variables significantly influence $Days_{it}$ in the first place.

Fourth, and most importantly, I study a time period during which municipalities did not have the possibility of scheduling *Bürgermeister* elections on their own. In the 1994–1998 period, scheduling these elections was the task of the supervisory authority (Staatsanzeiger für das Land Hessen, 1998). Thus, estimates that derive solely from this period are not plagued by any concerns of endogeneity through self-selection. Moreover, in this period, not even supervisory authorities were allowed to combine local elections (such as *Bürgermeister* and *Landrat* elections) with elections for higher tiers of government (i.e., European, federal, or state elections). Thus, the arguably largest incentive for the strategic scheduling of local elections—namely, to benefit from higher turnout at major national or state elections—is absent in this period.¹⁴ Therefore, the strate-

¹⁴ Note that it was not prohibited to hold *Bürgermeister* elections on the same day as national, state, or European elections. However, the elections had to be kept strictly separate from an organizational point of view (e.g., separate invitations to voters, separate election assistants, etc.). Most importantly, the voting itself had to take place at different sites. This made elections on the same day very difficult, and removed the incentives for them, because (i) if separate places had to be used, it would be unlikely that turnout would benefit from having two elections on the same day (i.e., marginal transport costs for the additional election are not zero); (ii) it is difficult enough to find election assistants for one election, and finding enough assistants for a separate additional election on the same day is likely too difficult for the mostly small municipalities that I study; and (iii) the small municipalities that I study might experience difficulties in finding enough additional locations where a second election might take place (i.e., the number of necessary locations doubles). Consistent with this, in the 1994–1998 period, of a total of 434 *Bürgermeister* elections, only 12 have been held on the same day as a national, state, or European election. In com-

gic scheduling of elections is likely eliminated if the focus is on European, federal, and state elections in the 1994–1998 period, and this allows for a very clean identification of effects.

Additionally, a reform instituted in 1998 (and whose first application was to the state election in 1999) allows me to apply a robustness check to assess the extent to which strategic considerations by political parties might influence the results. Precisely, the state parliament ruled that starting with the state election in 1999, municipalities would be allowed to combine *Bürgermeister* elections with European, federal, or state elections. However, as further ruled by the state parliament, this was allowed only if the municipal council decided it with a two-thirds majority. For a single party, such a majority is very rare in Hesse’s municipalities, and compromises among parties are thus necessary. Strategic considerations by parties regarding the combination of *Bürgermeister* and major elections would be plausibly absent, if I were to restrict the sample to those municipality-election combinations where no party held more than two-thirds of the seats in the municipal council.¹⁵

3.3 What determines $Days_{it}$?

As indicated above, an important test to assess whether endogeneity through strategic scheduling is a real concern is to investigate what determines $Days_{it}$ in the first place.

For this sake, I regress $Days_{it}$ on the observable covariates for both the full time period

parison, in the 1999–2003 period, from a total of 454 *Bürgermeister* elections, 60 have been held on the same day as one of the three higher-office elections.

¹⁵ Before 1999, *Bürgermeister* elections were allowed to be combined with local council elections; for this reason, I exclude local council elections when the focus is on the 1994–1998 period. However, after 1998, a two-thirds majority was also needed when *Bürgermeister* elections should have been combined with local council elections.

and for the restricted 1994–1998 sample. The results are shown in Table 3. For the full period, only the share of foreigners and the proportion of people aged older than 65 have a significant effect. Both variables have a positive effect on $Days_{it}$.

This effect is most likely driven by the combination of *Bürgermeister* elections with those elections listed in Table 2. If a *Bürgermeister* election is combined with one of these elections, then $Days_{it}$ is large, because no *Bürgermeister* election occurred between the current election and the most recent one with uniform dates across municipalities. The results would then suggest that municipalities with a high proportion of people aged above 65 and a high share of foreigners are more likely to combine *Bürgermeister* elections with other elections. Correspondingly, these effects are insignificant for the restricted sample (column 2) when such a combination was not possible (t-statistics shrink from 4.56 to 0.32, and from 2.78 to 0.26, respectively). By combining *Bürgermeister* elections with other elections, municipalities thus want to spare older, relatively immobile voters the effort of going to the polls twice.¹⁶ Moreover, some foreigners are vote-eligible for *Bürgermeister* elections as well as local council and European elections; thus, by combining *Bürgermeister* elections with other contests, this population group need only go to the polls once. Because all other variables, especially the political variables, have no influence on $Days_{it}$, these results suggest that rather than because of strategic considerations, election timing is driven by practical considerations. Moreover, the results suggest that municipalities base their decisions regarding the timing of elections on a few observable variables that also happen to be available to the econometrician.

¹⁶ Some municipalities even offer transport services to old and immobile voters. Thus, by combining two elections, municipalities might even reduce their expenditures.

4. Results

4.1 Baseline results

As a simple first investigation, I plot turnout against days since the most recent election. Figure 4 shows a strong positive relationship between the two variables (the correlation coefficient is 0.199), i.e., the greater the temporal distance is between two elections, the greater the turnout in the present election will be.

I analyze the influence of the number of days since the most recent election on turnout more formally, via empirical model (1). Baseline results are shown in Table 4, where all elections listed in Table 2 are pooled together. In column 1, to provide a benchmark, I show the results of (1) in the absence of fixed effects or any control variables. As can be seen, the number of days since the most recent election has a highly significant effect on turnout. In column 2, I include fixed effects; the point estimate becomes smaller and suggests that one additional day since the most recent election increases turnout at the studied contest by approximately 0.0016 percentage points. This means that if there were 365 days between two elections, turnout at the later election would be more than 0.58 percentage points higher, compared to an election that is held immediately after the most recent one. This effect is highly significant at the 1% level, and the t-statistic exceeds 6.

Column 3 includes the aforementioned control variables. As explained, one can interpret the change in the coefficient stemming from the inclusion of observable control variables as a good indicator of the extent to which the results may be biased by unobservable omitted variables. Accordingly, it is very reassuring to see that the coefficient

of interest stays almost completely unchanged following the inclusion of the control variables.¹⁷ Inferences do not change, either. From the set of included control variables, eight are significantly associated with turnout: population size, the share of people aged above 65, the proportion of females, the vote share of FDP and of the Greens, local GDP per capita, and concurrent elections each has a significantly positive association with turnout, and the number of eligible voters has a significantly negative association with turnout. As the observable covariates—of which many highly correlate with turnout—do not influence the effect of interest, an unobservable covariate that correlates with turnout must have an extremely large effect in explaining away the voter fatigue effect; this seems highly unlikely.

Columns 4 (without control variables) and 5 (with control variables) restrict the sample to the time period in which municipalities had no possibility of scheduling elections, and in which endogeneity concerns are therefore plausibly absent. As can be seen, the effect of the days since the most recent election on turnout is even larger than before, and still highly significant. Moreover, coefficients before and after the inclusion of the control variables are almost identical. These results suggest that, if anything, endogeneity leads to coefficients that are too low; this reinforces my conclusions. Interestingly, the mechanism mentioned in subsection 3.2 as to why elections would be scheduled strategically is consistent with the larger point estimate in the no-endogeneity case (columns 4 and 5): if municipalities with low civic engagement did schedule *Bürgermeister*

¹⁷ Precisely, the point estimate changes from 0.0016 to 0.0017. However, this minimal change is due not to the inclusion of control variables, but to the fact that I lose 426 observations (i.e., data for the European election in 2014) because local GDP data for 2013 are not yet available. If I restrict the sample to those observations for which local GDP data were available, I again derive a point estimate of 0.0017 when no control variables are included. According to the statistical office, the missing local GDP data will become available in December 2015; at that time, I will update the results.

elections to be concurrent with major races, then one would expect the change in coefficients that we observe here.

4.2 Decomposition by election type

Whereas I have thus far pooled observations from all available elections, it is plausible that the voter fatigue effect is heterogeneous across different election types. Although voters might be tired of elections, they might not want to miss the opportunity to vote at those elections that they consider very important. Therefore, in this section, I decompose the voter fatigue effect by election type.

Judging from the discussion in subsection 2.2 concerning voter turnout levels among different election types and the discussion in the existing literature (e.g., Franklin, 2001), the most important elections in the eyes of voters are most likely the federal elections. Elections to the federal parliament have consistently outperformed other election types in Germany in terms of turnout; the existing literature suggests that the elections considered most important by voters are those where (i) higher tiers of governments are elected and (ii) voters have (at least some) influence on the composition of the executive. As the connection between European elections and the composition of the European Union executive was, at best, loosely in the past, it might be unsurprising that elections to the European parliament have seen relatively low turnout levels. According to the turnout levels discussed in section 2, one would expect the following ordering regarding the voter fatigue effect among the various election types.

$$\hat{\beta}_{\text{European Election}} > \hat{\beta}_{\text{Local Council Election}} > \hat{\beta}_{\text{State Election}} > \hat{\beta}_{\text{Federal Election}} \quad (2)$$

In other words, I expect the estimated voter fatigue effect to be largest for European elections and smallest (or even absent) for federal elections.

Table 5 shows the results of this exercise, both with and without control variables.¹⁸ Interestingly, voter fatigue effects can indeed be ordered in line with the typical turnout levels that the elections receive. For the federal election, no significant voter fatigue effect exists, and the point estimate is virtually zero. However, highly significant voter fatigue effects can be found for all other election types. For European elections, the estimate even suggests that a temporal distance of one year between two elections increases turnout at a European election by more than 2 percentage points; this is a considerable effect, given the relatively low turnout for this election type.

Moreover, these findings make another point as to why endogeneity is unlikely. If the results were indeed caused by endogeneity problems, then unobservable, omitted variables would bias the results in exactly such a way that they would correspond to my priors on the ordering (2) of the voter fatigue effect. As there are no reasonable arguments for why this could be the case, I reassert that endogeneity is a non-issue in the present setting.

4.3 When Does the Voter Fatigue Effect Fade Out? A Time Profile

Thus far, I have assumed that there is a linear relationship between the number of days since the most recent election and turnout. However, it is plausible that the voter fatigue

¹⁸ In September 2013, state and federal elections were held on the same date, as can be inferred from Table 2. Thus, as one cannot clearly assign these observations to either the state or federal category, I have excluded them here. Note that the results for state elections remain completely unchanged if the election results for the 2013 state election are included, while the voter fatigue effect for federal elections would be larger than those cited here. Thus, the exclusion of these observations leads, if anything, to estimates that are overly conservative.

effect fades out at some point in time. This would point to a nonlinear effect: when the most recent election had been held, say, three months previous, there could be a large fatigue effect, but there could be no effect at all when the most recent election had been held, say, two years previous. Even a U-shaped relationship between turnout and days since the most recent election could be possible if one were to assume that an election temporarily increases voter interest and thus increases turnout in the short run.

To allow for a more flexible specification, instead of $Days_{it}$, I now include dummy variables in the specification. $Days1-100_{it}$, for example, takes a value of 1 when the most recent election had been held in the previous 100 days, and 0 otherwise. $Days101-200_{it}$ takes a value of 1 when the most recent election had been held 101–200 days previous, and 0 otherwise, and so forth. I use dummy variables up to 701–800 days. (There are 378 observations with a temporal distance exceeding 800 days since the most recent election; these will constitute the reference category.)

Table 6 shows the results. For elections with a temporal distance of less than 100 days, the turnout is more than 2 percentage points lower. This effect is highly significant, with a t-statistic of approximately 8. For $Days101-200_{it}$, the effect is significant at the 10% level, and it is considerably smaller. For more than 200 days since the most recent election, effects are always insignificant and small. Therefore, a conservative conclusion would be that the effect fades after six months; however, the effect is already quite small when only three or more months have passed.¹⁹

¹⁹ I also performed estimations in which I used smaller intervals. For example, I experimented with interval lengths of 30 and 50 days. The results from an interval length of 100 days are confirmed in these estimations. However, the number of observations in the intervals are sometimes small for these specifica-

5. Robustness checks

I checked the robustness of the results in a variety of ways. First, I use an alternative measure of voter fatigue. Voters might be tired not only by two temporally close elections in a row, but by too many elections over a fixed period. Therefore, as an alternative explanatory variable, I employ a variable that denotes the number of elections in a specific period. Of course, it is not *a priori* clear how long such a period should be; for this reason, I experiment with three different variants: “number of elections in the last 6 months,” “number of elections in the last 12 months,” and “number of elections in the last 24 months.” Importantly, due to the staggered timing of *Bürgermeister* and *Landrat* elections, the variable of interest, again, quasi-experimentally differs across municipalities. Moreover, endogeneity concerns are even lower than in the other regressions, because municipalities have had even less influence than before with regard to the number of elections in the last months. Even if they schedule *Bürgermeister* elections, these runoff elections may well result in a second round if no candidate wins in the first round. Thus, the number of elections might increase without bearing any influence from the municipality.

Table 7 shows the results of using the alternative variables. For each of the three explanatory variables, the number of elections is found to have a highly significant and negative effect on voter turnout. In columns 2, 4, and 6, I also include dummy variables for the number of elections in the considered period. As expected, the largest negative effect on turnout occurs if a very large number of elections has been held over a fixed period.

tions, and the results can depend on a few outliers (especially when the number of days is large). Therefore, the specification reported here is my preferred one.

Furthermore, I included municipality-specific linear and quadratic time trends. These specifications can absorb linear and quadratic differences in turnout trends across municipalities. While unlikely, it could in principle be possible that the turnout trend coincidentally correlates with the temporal distance between elections. Of course, such an exercise is computationally highly demanding, as 426 or even 852 additional control variables would need to be included. These additional control variables absorb a huge amount of variation. However, as the data in columns 1 and 2 of Table 8 show, the coefficient of interest only marginally changes, and it remains highly significant.

As described above, one concern might arise because, for both federal and state elections, a mixed-member proportional election system is in place. In these elections, each voter has two votes (Spenkuch, 2014). The first vote elects for each single-member district a district representative, in a first-past-the-post system. The second vote is the party vote, which determines via a proportional election system how many seats a party obtains in parliament. In a nutshell, the first vote thus only decides which specific representatives acquire some of the seats that a party has received.²⁰ It can, however, not generally determine which parties/party win(s) the elections and form(s) the executive in the new legislative term. Thus, the list vote, for which the relevant area is the entire state/country, is the more important one. It is therefore very likely that voters form expectations about the closeness of the contest based on the list vote. If, by contrast, voters make the decision to turn out based on the contest at the district level (i.e., based on the

²⁰ A rare exception (especially in state elections, where excess seats have only occurred in the 2009 election) is the possibility of excess seats (*Überhangmandate*). In such a case, for specific combinations of the numbers of first and second votes, a party can acquire more seats than that determined by the second vote.

first vote), then the electoral race for federal and state elections would not be the same across all of Hesse's municipalities; rather, they would differ across election districts. For example, voters of different districts will face different (expected) closeness in the electoral race.

Note that there were 55 districts for each state election. For federal elections, Hesse's 426 municipalities were distributed among 21 districts in the years 2002, 2005, and 2009, and 22 districts in the years 1994, 1998, and 2013.

However, this concern can be addressed quite easily, in an econometric manner. A solution is to include—for separate samples of all state and all federal elections—a fixed effect for each district–election combination. In this way, for each election district-specific factors—such as candidate quality or expected closeness of the candidate race—can be captured, because only variation within each of the district–election cells is used.²¹ Columns 3 and 4 of Table 8 show the results when the district–election fixed effects are included. The voter fatigue effect for the federal election remains small and insignificant, while the effect for the state election remains highly significant, although the additional fixed effects absorb a large amount of variation. Thus, the existence of a mixed-member proportional election system for these two election types poses no threat to my identification strategy.

²¹ Note that for state elections, the five largest cities are excluded from this robustness check, as each of these cities has its own district(s). Some of these cities are even divided into two districts. Thus, the fixed effects for district–election combinations in these five cities effectively capture all of the variation in $Days_{it}$. For federal elections, only the largest city (Frankfurt am Main) is excluded.

As explained, a good robustness check to test for the influence of strategic behavior by political actors on the results is to exclude those situations in which a party had a two-thirds majority in the municipal council. In such a case, a party could on its own decide whether to combine *Bürgermeister* elections with some other contest. As in elections, gains for one party imply losses for some other party, strategic behavior of parties likely neutralizes if no one party can unilaterally schedule elections. Column 5 of Table 8 shows that the results remain virtually the same. In addition, nonreported robustness checks, I also exclude from the sample those cases in which one of the most common party blocs in (West) German politics (i.e., the center-right CDU and the liberal FDP versus the center-left SPD and the environmentalist Greens) together has a two-thirds majority in the municipal council. Again, the results remain the same.

A further concern might be that I have thus far excluded referenda from my analysis; I exclude referenda as they are not the same as ordinary elections. Whether or not voters can become fatigued from referenda and thus decide to abstain from voting in the next ordinary election is not *a priori* clear. However, although Hesse introduced direct democracy at the local level in 1993, its influence on the legislative process in Hesse's municipalities has been very restricted. In more than 20 years, there have been only 133 referenda; this figure corresponds to less than one-third of a referendum per municipality. Thus, if I include referenda in the analysis, $Days_{it}$ changes only in very few cases.²²

I re-run my analysis using the modified explanatory variable but, as expected, the results remain completely the same; for this reason, I do not include them here.

²² For $Days_{it}$ to change on account of referenda, it does not suffice for a referendum to have occurred in a municipality: this referendum must also be temporally closer to the studied contested local election. This happens in only a very few cases. The correlation between $Days_{it}$ with and without referenda included, respectively, is therefore 0.9857.

Because the municipalities of the same county hold *Landrat* elections all on the same day, there is likely some correlation of $Days_{it}$ for municipalities within the same county. (However, this correlation must be far from perfect, as *Bürgermeister* elections are usually held on different dates, even among municipalities within the same county.)²³ Likewise, one might suppose that turnout is spatially correlated because, for example, weather shocks are geographically clustered and could influence turnout (e.g., Knack, 1994; Gomez et al., 2007; Fraga et al., 2010). To evaluate the robustness of the results vis-à-vis spatial dependencies, I include in the model a spatially lagged dependent variable. Specifically, I employ a distance matrix that takes a value of 1 if two municipalities share a common border and 0 otherwise. Afterwards, I row-normalize the matrix. Column 6 of Table 8 shows the results: the spatially lagged dependent variable is highly significant. Nonetheless, the voter fatigue effect remains almost completely unchanged and still highly significant. Thus, my results do not seem to be driven by spatial dependencies.²⁴

I perform several additional robustness checks whose results I omit from here due to space considerations. For example, I exclude single elections from the sample, include additional control variables not available for the entire study period (e.g., wage level, unemployment rate), and employ the transformed outcome variable mentioned in subsection 2.1. Furthermore, I restrict $Days_{it}$ to a maximum number of 200 (other cut-offs

²³ Dreßler (1998) writes that municipalities of the same county tend to often hold *Bürgermeister* elections on the same day. However, such a pattern can clearly not be confirmed in my data. There are, if at all, only a very small number of municipalities of the same county that hold *Bürgermeister* elections on the same day.

²⁴ I lose 21 observations because the municipality of Reinhardshagen has no populated neighbors in Hesse. Rather, it borders forest areas (*gemeindefreies Gebiet*). Additionally, Reinhardshagen shares a common border with a municipality of the state of Lower-Saxony.

garner similar results), so as to exclude the possibility that the results are driven by a few large $Days_{it}$ values. Relatedly, I employ $Days_{it}$ in logarithms. The results, however, remain unchanged.

6. Conclusion

This study estimates the effect of voter fatigue on turnout by exploiting a natural experiment in the German state of Hesse. Specifically, due to the staggered timing of some local elections, for elections with uniform election dates across municipalities, different municipalities face the same contest but experience a variety of temporal-distance values with respect to their most recent election. These circumstances allow me to isolate the voter fatigue effect from all contest-specific factors (such as saliency, candidate quality, or expected closeness), most of which would be otherwise difficult to control for. I find that the closer in time the present election is to the most recent one, the lower the turnout tends to be. Moreover, I find that the voter fatigue effect fades after approximately six months.

The results are highly relevant with respect to both policy and academia. First, the results are very important to the design of election schedules. As voter turnout has severely decreased in many democratic countries in recent decades, the issue of how to increase turnout has become a focus of policy-makers. Election scheduling is often suggested as an institutional instrument by which voter turnout can be increased. The results of the current study suggest that to increase turnout, the frequency of elections should be reduced. This finding is particularly relevant for many countries in which, for example, local and national elections are held on different days (as is the case for Cana-

da, Germany, Spain, and the United Kingdom, to name just a few). Moreover, it is relevant for countries such as the United States and Switzerland, which have—due to the roles played by primaries and referenda—a very high frequency of contests. The frequency of election dates can be reduced by holding concurrent elections. In a companion study, I (Garman, 2015) provide causal evidence that concurrent elections lead to higher turnout; on the other hand, Augenblick and Nicholson (2012) suggest that increasing the number of decisions made on the same day increases choice fatigue and therefore the number of abstentions. Therefore, concurrent elections may be beneficial in terms of turnout, but only up to a certain number of decisions. Considering this, a second alternative would be to mandate by law a specific period between two elections. My results suggest that a period of three to six months would suffice.

Second, the results are important to the development of (behavioral) models of turnout. Behavioral models of turnout, pioneered by Bendor et al. (2003), have been developed to explain the paradox of positive turnout in large populations. However, these models have been less concerned with large variations in turnout across jurisdictions (even for the same contest). My results suggest that enriching these models with contextual variables such as the election schedule could help predict positive turnout among large populations that is heterogeneous across jurisdictions.²⁵ In this way, two important empirical regularities can be explained.

²⁵ An alternative approach in explaining different (positive) turnout levels across jurisdictions would be to correlate turnout with genetic predisposition (Fowler and Dawes, 2008). However, Charney and English (2012) call into question the validity of all studies that suggest that genes can explain complex behavior such as voter turnout.

Third, the results of the current study suggest studying the role of choice fatigue in sequential decision-making also for longer-term decisions. This might also be extended to contexts other than voting. For example, it often seems that people tend to own a particular car longer than justified by purely monetary reasons. Often, the cumulative costs of repair are far higher than the net expenditures related to the purchase of a new car (i.e., price of a new car minus the resale value of the old car). While one might suggest that cars also have some personal value for owners, buying cars (and searching for relevant information) could also incur a mental cost that people try to avoid for as long as possible.²⁶ Similar observations might be made in the job or housing markets. This could be particularly salient with respect to relationships, where many people stay in unhappy marriages because of the perceived mental cost of leaving their partner. As such choices might be more important and more fatiguing for people than voting decisions, it might take much more time—perhaps years or even decades—until people are ready to make new choices in these areas.

²⁶ Levav et al. (2010) provide evidence that indeed choice fatigue plays a role in car purchases in the short (i.e. immediate) term.

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Tables

Table 1: Summary statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Turnout	8,946	63.55	15.64	24.46	91.86
<i>Days_{it}</i>	8,946	334.72	234.80	7	910
Number of eligible voters	8,946	10,285.98	23,744.62	552	453,480
Population size	8,946	14,193.44	37,360.48	622	701,350
Population density	8,946	338.90	391.48	20.75	2,823.93
Proportion of old, 65+	8,946	18.31	3.32	8.5	31.7
Proportion of young, 0-15	8,946	15.32	1.95	8.3	22.6
Proportion of female	8,946	50.55	0.99	44.6	55.1
Proportion of foreigners	8,946	6.87	4.84	0	32.7
Real GDP per capita	8,520	5,775.52	3,173.87	1,768.81	50,934.69
Vote share CDU	8,946	0.331	0.123	0	0.726
Vote share SPD	8,946	0.394	0.130	0	1
Vote share FDP	8,946	0.033	0.039	0	0.346
Vote share Greens	8,946	0.052	0.039	0	0.359
Political competition	8,946	2.98	0.669	1	7.45
Number voter associations	8,946	1.16	0.820	0	7
Concurrent election	8,946	0.087	0.281	0	1
Number of elections last 6 months	8,946	0.487	0.672	0	4
Number of elections last 12 months	8,946	0.988	1.02	0	5
Number of elections last 24 months	8,946	2.23	1.26	0	8

Table 2: Elections studied in this paper

<u>Type of election</u>	<u>Election date</u>
Election to the European parliament	June 12, 1994
Federal Election	October 16, 1994
State Election	February 19, 1995
Local Council Election	March 2, 1997
Federal Election	September 27, 1998
State Election	February 7, 1999
Election to the European parliament	June 13, 1999
Local Council Election	March 18, 2001
Federal Election	September 22, 2002
State Election	February 2, 2003
Election to the European parliament	June 13, 2004
Federal Election	September 18, 2005
Local Council Election	March 26, 2006
State Election	January 27, 2008
State Election	January 18, 2009
Election to the European parliament	June 7, 2009
Federal Election	September 27, 2009
Local Council Election	March 27, 2011
Federal Election	September 22, 2013
State Election	September 22, 2013
Election to the European parliament	May 25, 2014

Table 3: What determines the temporal distance to the last election?

VARIABLES	(1) <i>Days_{it}</i>	(2) <i>Days_{it}</i>
Number of eligible voters	-0.001 (-1.165)	0.009 (0.522)
Population size	0.000 (0.130)	-0.014 (-1.065)
Proportion of young, 0-15	-0.726 (-0.214)	5.170 (0.357)
Proportion of old, 65+	13.452*** (4.647)	5.670 (0.360)
Proportion of females	-2.654 (-0.390)	-8.360 (-0.438)
Proportion of foreigners	8.462*** (2.643)	0.409 (0.067)
Population density	0.205 (1.299)	-1.464 (-1.514)
Real GDP per capita	0.008 (1.514)	-0.064** (-2.294)
Vote share CDU	-54.269 (-1.112)	-21.199 (-0.144)
Vote share SPD	-87.108 (-1.354)	-84.421 (-0.449)
Vote share Greens	-75.007 (-0.651)	182.461 (0.646)
Vote share FDP	-99.190 (-0.830)	-14.807 (-0.036)
Political competition	-0.020 (-0.002)	-15.729 (-0.588)
Number of local party lists	-0.013 (-0.002)	-2.447 (-0.146)
Observations	8,520	1,704
R-squared	0.651	0.749
Number of clusters	426	426
Time period	FULL	1994-1998
Elections	E,F,L,S	E,F,S

All regressions include, but do not report, municipality- and election-fixed effects. t-statistics based on clustered standard errors in parentheses. E=European elections, F=Federal elections, L=Local council elections, S=State elections. *Significant at the 10 percent level, **Significant at the 5 percent level, ***Significant at the 1 percent level.

Table 4: Baseline results

VARIABLES	(1) Turnout	(2) Turnout	(3) Turnout	(4) Turnout	(5) Turnout
<i>Days_{it}</i>	0.0023*** (5.3189)	0.0016*** (6.4725)	0.0017*** (6.1590)	0.0028*** (3.9458)	0.0030*** (4.6921)
Number of eligible voters			-0.0002* (-1.7727)		0.0008*** (3.4032)
Population size			0.0002** (2.2465)		-0.0004** (-2.0894)
Proportion of young, 0-15			0.1118 (1.5699)		-0.1597 (-0.6862)
Proportion of old, 65+			0.3081*** (5.5369)		-0.0683 (-0.2907)
Proportion of females			0.2725** (2.2083)		-0.0364 (-0.0950)
Proportion of foreigners			0.0513 (0.9368)		0.0565 (0.5592)
Population density			-0.0020 (-0.3792)		-0.0120 (-1.1570)
Real GDP per capita			0.0008*** (5.2381)		-0.0009** (-2.5776)
Concurrent election			2.6174*** (11.7426)		5.6681*** (3.5595)
Vote share CDU			1.7385 (1.5528)		0.7371 (0.3220)
Vote share SPD			0.6895 (0.5200)		-0.4138 (-0.1564)
Vote share Greens			5.2433*** (3.0552)		12.1683*** (3.5084)

Vote share FDP			6.0139**		4.6454
			(2.2633)		(0.6685)
Political competition			-0.0153		-0.2979
			(-0.0803)		(-0.7776)
Number of local party lists			0.1221		-0.0739
			(0.9178)		(-0.2766)
Observations	8,946	8,946	8,520	1,704	1,704
Municipality-fixed effects	NO	YES	YES	YES	YES
R-squared	0.8888	0.9457	0.9505	0.9591	0.9606
Number of clusters	426	426	426	426	426
Time period	FULL	FULL	FULL	1994-1998	1994-1998
Elections	E,F,L,S	E,F,L,S	E,F,L,S	E,F,S	E,F,S

All regressions include, but do not report, election-fixed effects. t-statistics based on clustered standard errors in parentheses. E=European elections, F=Federal elections, L=Local council elections, S=State elections. *Significant at the 10 percent level, **Significant at the 5 percent level, ***Significant at the 1 percent level.

Table 5: Decomposition by election type

VARIABLES	(1) Turnout	(2) Turnout	(3) Turnout	(4) Turnout	(5) Turnout	(6) Turnout	(7) Turnout	(8) Turnout
<i>Days_{it}</i>	0.0001 (0.3975)	0.0000 (0.0524)	0.0023*** (4.4210)	0.0020*** (4.0515)	0.0032*** (6.3425)	0.0029*** (5.6182)	0.0061*** (6.2381)	0.0060*** (8.6272)
Observations	2,130	2,130	2,130	2,130	1,704	1,704	2,130	1,704
Controls	NO	YES	NO	YES	NO	YES	NO	YES
R-squared	0.9018	0.9142	0.4273	0.4838	0.8854	0.8966	0.8000	0.9262
Number of clusters	426	426	426	426	426	426	426	426
Elections	Federal	Federal	State	State	Local	Local	European	European

All regressions include, but do not report, municipality- and election-fixed effects. t-statistics based on clustered standard errors in parentheses. As explained in footnote 18, the two elections in the year 2013 are excluded from the sample. Regressions with control variables include the same control variables as in Table 4. *Significant at the 10 percent level, **Significant at the 5 percent level, ***Significant at the 1 percent level.

Table 6: Relaxing the Linearity Assumption

VARIABLES	(1) Turnout	(2) Turnout
<i>Days1–100_{it}</i>	-2.1484*** (-7.9274)	-2.3492*** (-8.3688)
<i>Days101–200_{it}</i>	-0.4510* (-1.8350)	-0.3990* (-1.7106)
<i>Days201–300_{it}</i>	-0.0523 (-0.1817)	-0.0553 (-0.1999)
<i>Days301–400_{it}</i>	-0.2525 (-1.0170)	-0.2320 (-0.9977)
<i>Days401–500_{it}</i>	-0.0657 (-0.2429)	-0.0724 (-0.2756)
<i>Days501–600_{it}</i>	-0.1893 (-0.6602)	-0.2564 (-0.9807)
<i>Days601–700_{it}</i>	-0.2765 (-0.9282)	-0.2301 (-0.8214)
<i>Days701–800_{it}</i>	0.2355 (0.7022)	0.0484 (0.1473)
Observations	8,946	8,520
Controls	NO	YES
R-squared	0.9462	0.9513
Number of clusters	426	426
Time period	FULL	FULL
Elections	E,F,L,S	E,F,L,S

All regressions include, but do not report, municipality- and election-fixed effects. t-statistics based on clustered standard errors in parentheses. E=European elections, F=Federal elections, L=Local council elections, S=State elections. *Significant at the 10 percent level, **Significant at the 5 percent level, ***Significant at the 1 percent level.

Table 7: Alternative Explanatory Variables

VARIABLES	(1) Turnout	(2) Turnout	(3) Turnout	(4) Turnout	(5) Turnout	(6) Turnout
Number elections in last 6 months	-1.0577*** (-10.0892)					
Number elections in last 12 months			-0.5953*** (-9.4410)			
Number elections in last 24 months					-0.3561*** (-8.5005)	
One election		-0.7177*** (-3.6895)		-0.2982** (-2.0703)		-0.4421** (-2.2994)
Two elections		-2.2632*** (-9.1960)		-0.9032*** (-5.5118)		-0.3318 (-1.5969)
Three elections		-2.2821*** (-5.7763)		-2.1160*** (-9.5097)		-0.9206*** (-4.2791)
Four elections		-5.8768*** (-5.2477)		-2.1922*** (-6.5688)		-1.4128*** (-6.2959)
Five elections				-3.0632*** (-5.3974)		-1.7087*** (-6.5066)
Six elections						-1.8245*** (-4.0716)
Seven elections						-1.3385* (-1.8473)
Eight elections						-4.5386*** (-12.2848)
Observations	8,520	8,520	8,520	8,520	8,520	8,520
Controls	YES	YES	YES	YES	YES	YES
R-squared	0.9511	0.9512	0.9508	0.9509	0.9507	0.9508
Number of clusters	426	426	426	426	426	426
Time horizon	Last 6 months	Last 6 months	Last 12 months	Last 12 months	Last 24 months	Last 24 months

All regressions include, but do not report, municipality- and election-fixed effects, as well as the control variables mentioned in Table 4. t-statistics based on clustered standard errors in parentheses. *Significant at the 10 percent level, **Significant at the 5 percent level, ***Significant at the 1 percent level.

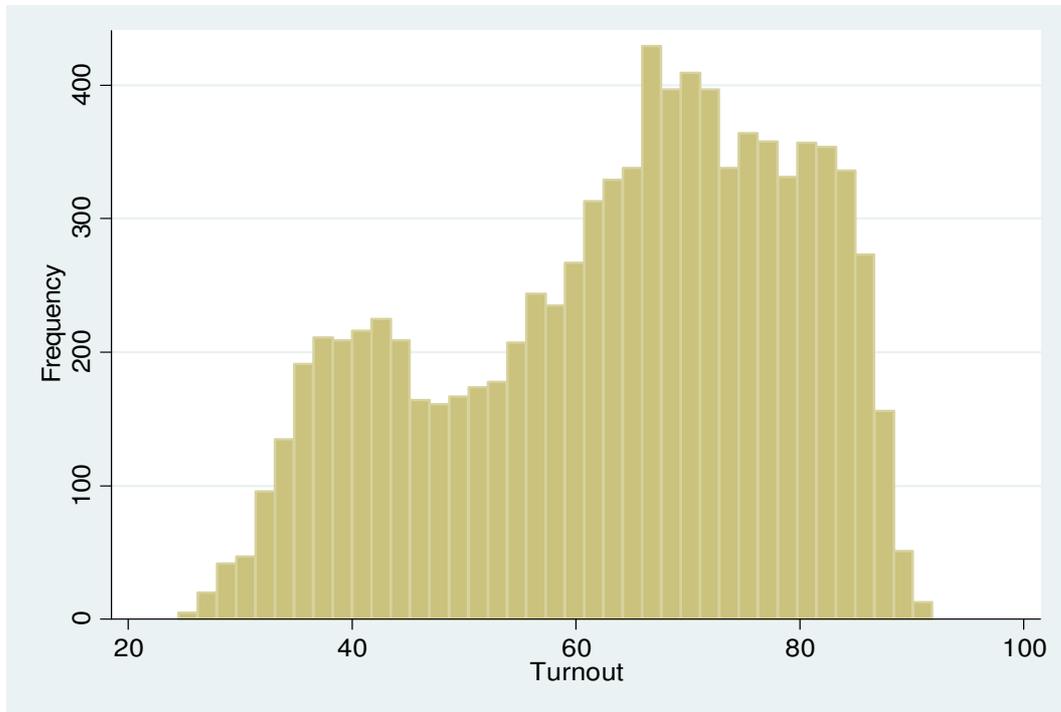
Table 8: Robustness checks

VARIABLES	(1) Turnout	(2) Turnout	(3) Turnout	(4) Turnout	(5) Turnout	(6) Turnout
<i>Days_{it}</i>	0.0018*** (6.2900)	0.0015*** (4.8700)	-0.0003 (-1.2381)	0.0011** (2.1166)	0.0017*** (6.0179)	0.0014*** (5.9637)
Spatially lagged turnout						0.8156*** (33.6639)
Observations	8,520	8,520	2,125	2,105	8,271	8,500
Controls	YES	YES	YES	YES	YES	YES
R-squared	0.9550	0.9565	0.9266	0.7593	0.9511	0.9674
Number of clusters	426	426	425	421	424	425
Elections	E,F,L,S	E,F,L,S	Federal	State	E,F,L,S	E,F,L,S
Robustness check	Linear Time Trend	Quadratic Time Trend	Election-District Fixed Effects	Election-District Fixed Effects	Only cases where seat share of strongest party in municipal council below 2/3	Spatially lagged dependent variable

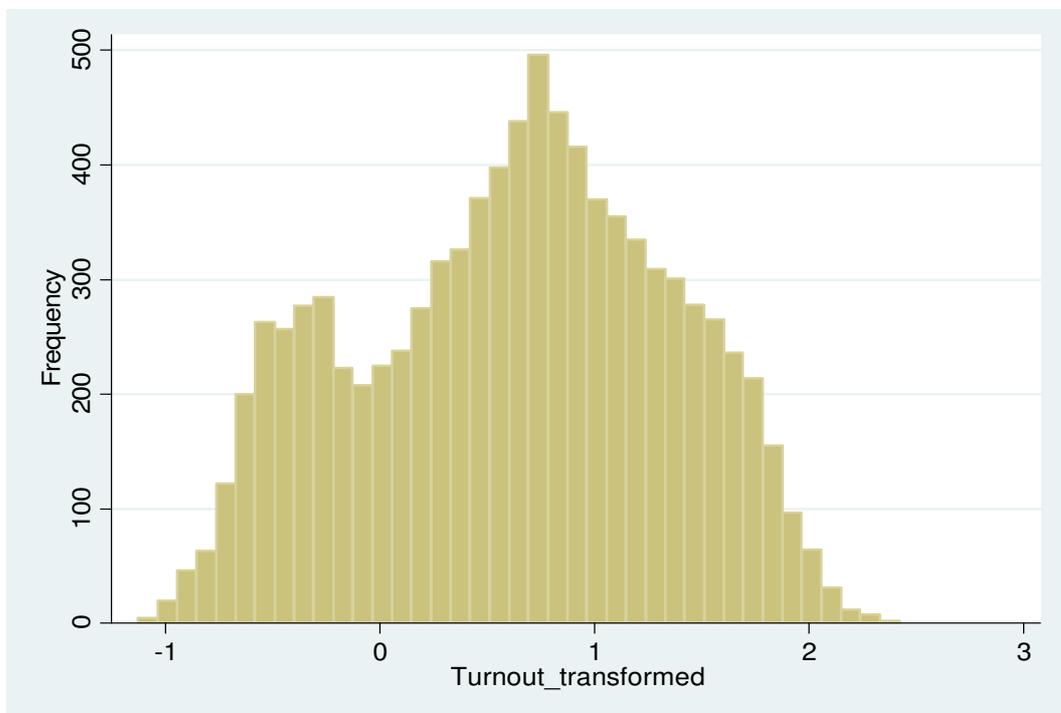
All regressions include, but do not report, municipality- and election-fixed effects, as well as the control variables mentioned in Table 4. E=European elections, F=Federal elections, L=Local council elections, S=State elections. t-statistics based on clustered standard errors in parentheses. *Significant at the 10 percent level, **Significant at the 5 percent level, ***Significant at the 1 percent level.

Figures

Figure 1: Histogram of outcome variables



(a) Turnout



(b) Transformed Outcome Variable

Figure 2: Illustration of empirical strategy

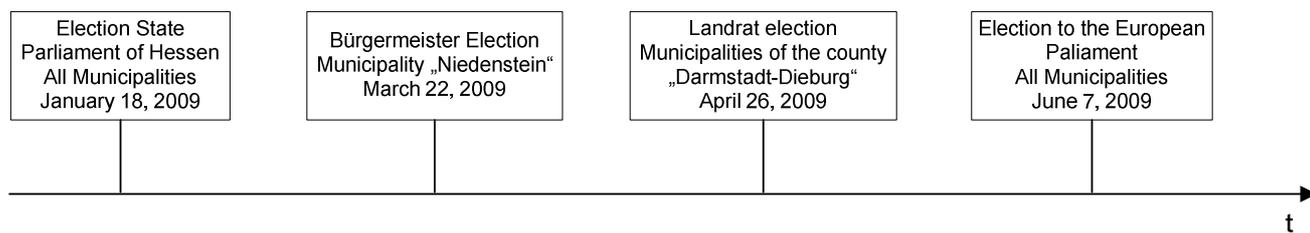
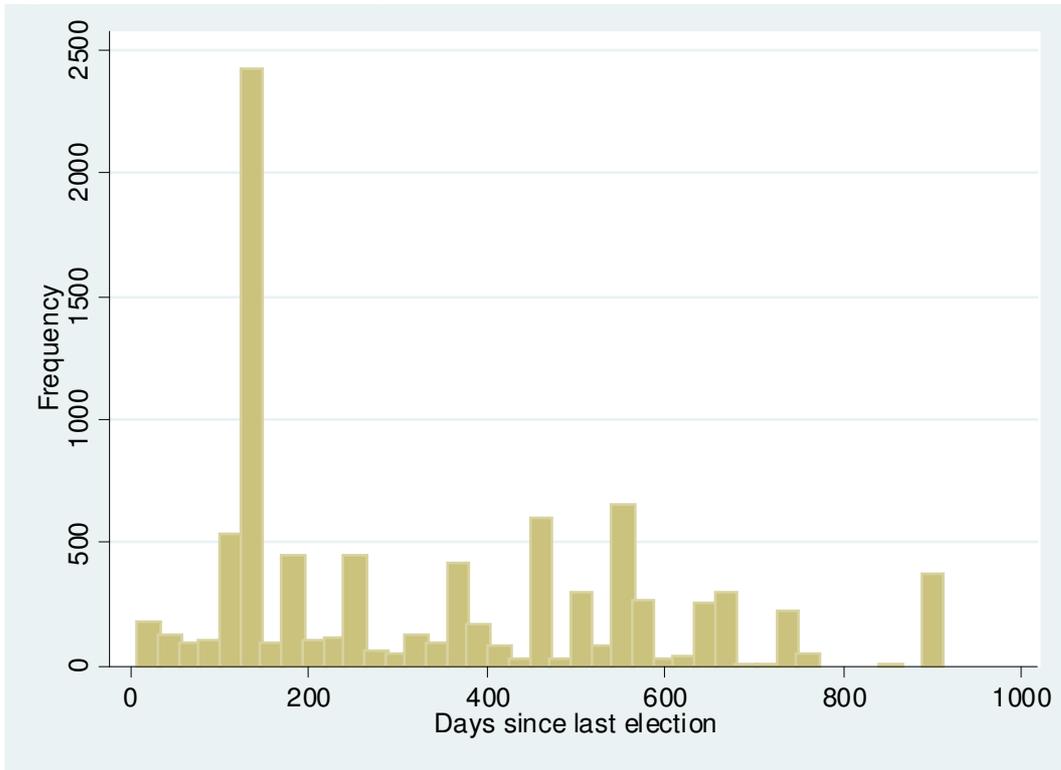
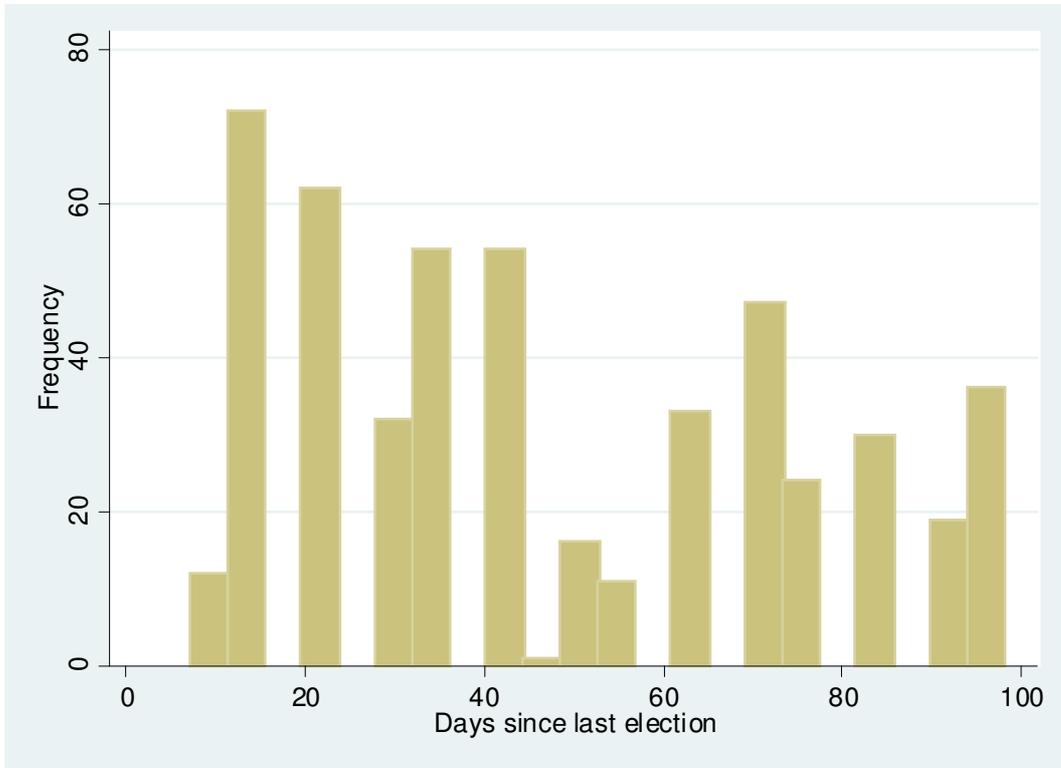


Figure 3: Distribution of days since last election



(a) Full Distribution



(b) Distribution for $Days_{it} < 100$

Figure 4: Plot of turnout against days since most recent election

