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Electoral Turnout During States of Emergency and Effects on Incumbent Vote Shares^{*}

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Abstract

Bavarian mayors are elected by majority rule in two-round (runoff) elections. Between the first and second ballot of the mayoral election in March 2020, the Bavarian state government announced an official state of emergency with measures to fight the spread of Covid-19, including a shutdown of public life. For the second ballot, voting in person was prohibited and only postal voting was allowed. We contrast turnout of the first and second ballot in 2020 with the first and second ballots from previous elections in a difference-in-differences setting. The state of emergency led to a more than 10 percentage points higher turnout in Bavarian municipalities. We employ the state of emergency induced higher turnout from the difference-in-differences setting as an instrument to analyze the effect of turnout on the vote shares of local incumbents. A 10-percentage point increase in turnout leads to a 3.4 percentage point higher vote share for incumbent mayors. Our results point to the relevance of turnout related incumbency effects.

Keywords: Incumbency effects, turnout, mayoral elections, voting in crises.

JEL Classification: D72

Declarations of interest: none

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I. INTRODUCTION

Reelection constraints contribute to making incumbents more accountable. Despite the disciplining function of elections, individual voters may prefer to abstain from voting given that the cost of casting a vote usually exceeds the likelihood that their vote will be decisive (e.g., Downs, 1957; Riker and Ordeshook, 1968; Feddersen, 2004). A large literature investigates drivers for turnout and decreasing the costs of voting is usually associated with higher turnout (e.g., Hodler et al., 2015; Schelker and Schneiter, 2017). Analyzing the effects of higher turnout on the electoral success of incumbents entails endogeneity issues: turnout may increase due to unobservable aspects of electoral competition or the valence of other candidates and these aspects are, at the same time, usually negatively related to the vote share of the incumbent (Grofman et al., 1999). Thus, high voter turnout is often associated with a low vote share of the incumbent, but high turnout does not necessarily cause lower vote shares.¹

To identify a causal effect of turnout on the vote share of the incumbent, we exploit a large, unexpected, and sudden increase in turnout from the first to the second ballot of the mayoral elections in the German state of Bavaria in March 2020. Between the two ballots, the Bavarian state government issued a declaration of a state of emergency due to the spread of Covid-19. Using the state of emergency induced increase in municipal turnout in the second ballot in an instrumental variable setting, our results indicate that incumbent mayors gain from a higher turnout.

Our empirical setting is informative: Elections in all Bavarian municipalities are held every six years and mayors are elected by majority rule in two-round (runoff) elections. Second ballots are held two weeks after the first ballot if no candidate gained an absolute majority in the first ballot. On Sunday, March 15, 2020 the first round of municipal elections in Bavaria was held as planned without any restrictions regarding voting in person and postal voting was

¹ E.g. Hansford and Gomez (2010), Martins and Veiga (2014) or Godbout (2013) provide mixed evidence for the link of turnout and incumbent's vote shares.

as always possible.² On Monday, March 16, the day after the first round of municipal elections a state of emergency was officially declared by the Bavarian state government, along with a centralization of decision-making powers and restrictions to individual mobility. The date for the second ballot of the municipal election remained Sunday, March 29, 2020 but voting in person was prohibited and only postal voting was allowed. Employing a difference-in-differences strategy to contrast the difference in turnout between the first and second ballot in 2020 to the difference in turnout in first and second ballots in previous elections, municipal turnout during the state of emergency increased by more than 10 percentage points (usually turnout falls in the second ballot).³ The increase in turnout is credibly exogenous to local political competition or valence of candidates and incumbents. We use the state of emergency induced increase in turnout as identified through the difference-in-differences analysis in an instrumental variable setting to investigate the share of votes captured by incumbents. A 10-percentage point increase in (instrumented) turnout leads to an increase of the vote shares of incumbents by about 3.4 percentage points. By contrast, when not accounting for endogeneity issues from omitted variables related to political competition, we would observe substantial negative bias, that is, the association of turnout and the vote shares of incumbents would be negative instead of positive (Grofman et al., 1999; Hansford and Gomez, 2010).

The remainder of this paper is structured as follows: Section II describes related literature. Section III presents the institutional setting and the state-wide emergency response due to the pandemic. We present our data and identification strategy in section IV. Estimation results are presented in Section V, and Section VI offers concluding remarks.

² The WHO's pandemic declaration was issued four days prior to the first ballot of the local election in Bavaria. The neighboring State of Vorarlberg in Austria cancelled their local elections scheduled for the same day.

³ Mandatory postal voting and the fact that the ballot papers were sent directly to eligible voters as well as the lack of alternative activities during the shutdown of public life might be possible explanations for the increase in turnout.

II. RELATED LITERATURE

There is a vast literature on the drivers of turnout in elections: longer opening hours and proximity to polling stations (Gimpel and Schuknecht, 2003; Haspel and Knotts, 2005; Garmann, 2017; Cantoni, 2020; Potrafke and Roesel, 2020), early voting (Kaplan and Yuan, 2020), concurrent elections (Fauvelle-Aymar and François, 2015; Garmann, 2016; Leininger et al., 2018; Garmann, 2019), and – partly for evident reasons – compulsory voting (Fowler, 2013; Jaitman, 2013; Ferwerda, 2014; Bechtel et al., 2016; Hoffman et al., 2017; Bechtel et al., 2018; Gaebler et al., 2020) have been shown to have a positive link with turnout. The relocation of polling stations (Brady and McNulty, 2011), information on the reduction of fines for missed votes (León, 2017) or knowledge of exit poll information (Morton et al., 2015) have a negative association with turnout. The option for postal voting is believed to increase turnout (Luechinger et al., 2007; Gerber et al., 2013; Hodler et al., 2015; Schelker and Schneider, 2017), but a heterogeneous effect of postal voting regarding the absence of social pressure may reduce incentives to go to the polls (Funk, 2010). Moreover, physical factors such as the weather have been shown to affect turnout: while most studies find a negative effect of bad weather (Shachar and Nalebuff, 1999; Gomez et al., 2007; Hansford and Gomez, 2010; Artés, 2014; Arnold and Freier, 2016; Arnold, 2018; Garcia-Rodriguez and Redmond, 2020), some studies find there is no effect (Knack, 1994; Persson et al., 2014; Meier et al., 2019), and some even suggest a positive effect of bad weather on turnout (Lind, 2020).

Some contributions analyze turnout after emergencies with inconclusive results: In the *aftermath* of natural disasters, turnout has been shown to be both higher (Fair et al., 2017) and lower in more affected areas (Sinclair et al., 2011; Rudolph and Kuhn, 2017). Some studies do not find a relevant effect of having been exposed to natural disasters on turnout or intentions to vote (Bechtel and Hainmueller 2011; Bodet et al., 2016; Lasala-Blanco et al., 2017). Health crises and the local prevalence of contagious diseases are shown to discourage from in person voting (Godefroy and Henry, 2016; Urbatsch, 2017). By contrast, Blesse et al. (2020) and

Leininger and Schaub (2020) analyze local exposure to Covid-19 prior to the state of emergency in the first round of the Bavarian local elections in 2020 and find a slightly higher turnout in counties that reported infected persons. We employ a difference-in-differences strategy to analyze the effects of voting *during* a state of emergency and compare first and second ballot turnout in mayoral elections across municipalities in Bavaria over different years.

Investigating implications of higher turnout regarding electoral outcomes is potentially more relevant for decision makers than understanding the multitude of the reasons for voter participation. Studies frequently employ rainfall (bad weather) or institutional changes as instruments to estimate the impact of higher turnout, particularly on party vote shares: some evidence suggests that left-wing parties profit from high turnout (Hansford and Gomez, 2010; Fowler, 2013; Finseraas and Vernby, 2014; Fowler, 2015; Arnold and Freier, 2016), other research indicates that smaller parties profit (Artés, 2014; Ferwerda, 2014), and some do not find any specific effect of higher turnout on parties' vote shares (Knack, 1994). Recent evidence suggests that rainfall may not only increase voting costs but may change voting behavior of those who cast a ballot, affecting voters through their emotions which would raise questions regarding the exogeneity assumption when employing rainfall as an instrument (Meier et al., 2019).

Directly associated to our study is a smaller literature that looks at the effect of turnout on incumbents' vote shares. High turnout in elections where the incumbent stands for re-election might be due to an incumbent's lack of popularity and the attempt to vote him/her out of office, and this would therefore coincide with low vote shares. In turn, low electoral competition is associated with low turnout but high vote shares of the incumbent (Grofman et al., 1999). Conversely, if turnout increases for reasons unrelated to competition, valence or performance and more occasional voters participate in the ballot, higher turnout may lead to higher vote shares for the incumbent. Results by Godbout (2013) tend to suggest that incumbents may not always suffer from high turnout when there are electoral coattails. Other

studies suggest that an increasing turnout can be detrimental to incumbents when analyzing elections for higher levels of government (Hansford and Gomez, 2010; Trounstein, 2012; Martins and Veiga, 2014). We directly contribute to this strand of literature by analyzing the effect of turnout on incumbent vote shares in the context of the Bavarian mayoral elections in 2020. We leverage the large and unexpected increase in turnout due to the state government's declaration of a state of emergency. The state of emergency is credibly unrelated to electoral competition or valence of candidates in local elections. Being interested in the causal effect of turnout, we hypothesize along with Grofman et al. (1999) that such an increase in turnout leads to higher vote shares of the incumbents in mayoral elections.

III. INSTITUTIONAL BACKGROUND AND ELECTIONS DURING THE PANDEMIC

Mayoral elections

Bavarian mayors are heads of the municipality's council and its administration. In municipalities with more than 10,000 inhabitants, they are civil servants for the duration of their 6-year-term. In smaller municipalities, mayors are either temporary civil servants or honorary mayors (see Art. 34-39 BayGO for further information on the status of mayors in Bavaria and their duties). Municipalities in Bavaria provide local infrastructure, primary education facilities, cultural and sport facilities, social and housing assistance, in addition to the organization of local, state and federal elections. Their revenues are composed of taxes set locally like business taxes or property taxes, fees and rule-based budget allocations from the state and federal government.

Mayors are directly elected by majority rule in two-round (runoff) elections. A second ballot is held two weeks after the first ballot if no candidate obtained the majority of votes. Only the two candidates with the most votes in the first ballot enter the runoff election. Mayoral elections take place on the same date in all 2,056 Bavarian municipalities every six years and are always jointly organized with elections for the municipal council and elections at the county

level.⁴ Voting dates only differ from the election cycle if mayors have withdrawn or died in previous terms. For the mayoral elections, eligible voters receive all necessary information regarding the election like date, time, and polling station, as well as information how to request postal voting. Voters may request postal voting until shortly before the election day; in response they receive the ballot paper and an envelope with prepaid postage.

Regarding political landscape, the center-right party *Christian Social Union* (CSU) is traditionally the dominating party in local, state, and federal elections in Bavaria. Over the whole period of our analysis, the CSU was leading the Bavarian state government. The CSU's position is less prominent for mayoral elections though. Other state-wide parties that frequently have candidates in mayoral elections are the *Social Democratic Party* (SPD), *Free Voters* (Freie Wähler) and the green party *Bündis90/Die Grünen*. In addition to state-wide party affiliations, voters' choices for mayors are determined by factors like personal characteristics, candidates' abilities, or their electoral programs. There are local associations that do not directly affiliate with a state-wide party in numerous municipalities and their candidates regularly win the mayoral elections.⁵

Elections and the Covid-19 State of Emergency

In February 2019, the mayoral elections for the subsequent year were scheduled for March 15, 2020. Candidates could register until January 23, 2020. At this time, it is unlikely that the number and composition of candidates and the incumbent's decision run were influenced by the spread of Covid-19 as it had not arrived in Germany yet. The first infection with Covid-19 in Bavaria (and Germany) was officially registered January 27, 2020. This infection chain was stopped. However, as was the case in other countries, the number of recorded infections started rising with the beginning of March 2020. The cumulated number of recorded infections

⁴ Next to the mayor, municipalities belonging to a county elect their municipal council and the council of the county by proportional rule. In 25 so-called "district-free" cities only the municipal council along with the mayor is elected. Councils of the city districts are additionally elected in the state capital Munich.

⁵ In some municipalities the CSU declines to nominate a candidate, or it even supports another party's candidate.

increased to 886 in Bavaria (Bavaria has a population of about 13 million) as of March 15, 2020. As of that date, four people infected with Covid-19 had died according to the Robert Koch-Institute.⁶

Before the first round of the mayoral election on March 15, authorities at the county level were responsible for deciding on case-related health measures. The strategy for dealing with Covid-19 concentrated on complying with hygiene standards, detecting and preventing infection chains, and isolation of infected persons and their contacts. Rulings by the Bavarian state government only prohibited large gatherings with more than 1,000 people. Prior to the election, the Bavarian state government gave assurances that the risk of infection in polling stations was low. Precautionary measures on the election day included the provision of information material, some hand sanitizers, and permission to vote using one's own pencil. Anecdotal information suggests a small rise in postal voting in comparison to previous local elections, but demand for ballot-by-mail was high even before the pandemic.⁷ Increases in postal voting have been a general trend in previous elections in Germany.

Besides its threat to public health, Covid-19 brought unexpected restrictions to individual mobility and public life (Chan et al., 2020). In the two weeks before the second ballot on March 29, 2020, rising numbers of infections prompted a sudden and drastic change in communication and a quick proliferation of measures to fight the pandemic. One day after the local elections on March 16, the Bavarian state government declared a state of emergency, and with that declaration, centralized decision-making regarding health-related measures, among others. Schools and kindergartens were closed. It also decided to shutdown public life by generally prohibiting events and gatherings, closing leisure facilities, restaurants, and shops. Election campaigns based on physical contact were no longer possible. On March 20, the state government prohibited leaving home for any reason except to work, do one's grocery shopping,

⁶ See https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/2020-03-15-de for more information (accessed December 23, 2020).

⁷ A reason why voters apply for ballot-by-mail in local elections is the size [literally!] of the ballot papers.

seek medical care, or take a walk for exercise (“stay at home order”).⁸ The measures taken against the spread of Covid-19 also affected the conduct of the second ballot. In accordance with the Ministry of Interior, Sports and Integration, the Bavarian Ministry of Health and Care decreed that the second ballot would be conducted only by postal vote. Eligible voters were sent the ballot papers directly, that is, they did not have to apply for them separately as in previous elections. The second ballot was held as planned in all municipalities – yet under the state of emergency – on March 29, 2020. On the same day, the Bavarian Agency for Health and Food Safety reported more than 13,000 infections and 110 fatalities linked to the pandemic.

IV. DATA AND IDENTIFICATION STRATEGY

Data

We manually compile a dataset for mayoral elections using reports published by the Bavarian State Agency for Statistics of the local elections in 2008, 2014 and 2020. The official reports include electoral results in first and second ballots for all municipalities with more than 10,000 inhabitants at the time of the election. We gather data on the number of eligible persons, voters, valid votes, incumbents, candidates, their party affiliation, and election results. From this information, we construct turnout and vote shares as well as variables for the candidate’s gender based on first names. Data for the number of infections and fatalities due to Covid-19 at the county level is taken from the Bavarian Agency for Health and Food Safety.

We employ data on municipalities with more than 10,000 constituents for reasons of consistency: Results from mayoral elections in smaller municipalities are provided, if at all, either by the counties or the municipalities themselves. Data availability, structure, and level of detail vary considerably over counties/municipalities in former electoral cycles. Besides that, the number of candidates and extent of electoral competition is usually low in small

⁸ See press statement of the Bavarian State Ministry for Health and Care <https://www.stmgp.bayern.de/presse/ausgangsbeschraenkung-in-bayern-wegen-coronavirus-pandemie-gesundheitsministerin-huml/>, accessed May 26, 2020.

municipalities such that second ballots are rarely held when incumbents run for reelection. In 2020 for instance, 48.4% of all municipalities with more than 10,000 inhabitants had a second ballot while the share of second ballots is only 11.3% in smaller municipalities. As we will show, we receive the same results using our identification strategy to estimate the effect of the state of emergency on turnout in a sample of *all* Bavarian *counties* electing the county commissioners.

The data from the Bavarian State Agency for Statistics cover 682 mayoral elections in 233 distinct municipalities from 2003 to 2020.⁹ This includes rescheduled elections, that is, elections needed when a mayor died or left office prior to the official election cycle. We complement missing data in the statistical reports retrieved from municipalities' webpages or newspaper articles for the first ballots of rescheduled elections. As we aim to contrast the difference in turnout from the first and second ballot in 2020 with the difference in turnout from first and second ballots in previous years for empirical identification purposes, we analyze all 263 mayoral elections with a first and second ballot. Therefore, we obtain a sample with 526 observations from the respective first and second ballots. From the 233 municipalities contained in the statistical reports, 90 municipalities held a second ballot once between 2003 to 2020, 58 have a second ballot twice, and 19 municipalities three times. 66 municipalities did not have a second ballot in the period analyzed.

Summary statistics for our final sample are provided in Table A1 in the Appendix. Turnout ranges between a minimum value of 34.3% and a maximum of 77.6%. Mean turnout is 57.3% with a standard deviation of 7.6%. Table A2 in the Appendix shows the distribution of mayoral elections with second ballot over time and regions. The absolute number of observations in 2020 is higher than in 2008 and 2014 for two reasons that are unrelated to the state of emergency: First, many rescheduled mayoral elections were adjusted in 2020 to take

⁹ Note that 682 is not a multiple from 233. Some municipalities are below the threshold of 10,000 inhabitants and not contained in the reports in some electoral cycles while others have more than the regular three elections due to rescheduled elections and shortened tenures.

place on the normal election dates again.¹⁰ Second, in 2020, more candidates competed in the first ballot, resulting in a higher likelihood of a second ballot.

Identification Strategy (Part 1): Establishing an Instrument for Municipal Turnout

To establish an instrument for municipal turnout, we first investigate the effect of the state of emergency on turnout in a *difference-in-differences* setting. The state of emergency was declared by the Bavarian state government after the first and before the second ballot in 2020. Hence, the presence and intensity of state-wide mandatory measures is credibly exogenous to municipal politics. Empirically, we contrast differences between first and second ballots in 2020 to previous years' differences and estimate:

$$(1) \quad \text{Turnout}_{itb} = \beta_1 \text{2nd ballot}_b + \beta_2 (\text{Election 2020}_t * \text{2nd ballot}_b) \\ + \text{Covid-19}_{itb} \gamma + X_{itb} \delta + \theta_i + \mu_t + \varepsilon_{itb}$$

Our unit of observation refers to a municipality in a year and for a certain ballot (first or second ballots), that is, the outcome variable is *Turnout* in mayoral elections in municipality *i*, in year *t* and for ballot *b*. *2nd ballot* is a dummy variable that takes a value of one for second ballots. The coefficient β_2 for the interaction term (*Election 2020* * *2nd ballot*) yields the effect of the state of emergency and its associated measures on turnout, that is, it identifies the difference between (1) the difference between the first and the second ballot in normal times and (2) the difference between the first and the second ballot during the state of emergency. We control for the local exposure to *Covid-19* at the county level to account for the local risk of infection. We also add a vector of control variables X_{itb} that captures ballot characteristics, municipality fixed effects θ_i , and we account for common time trends and the pandemic by including election year fixed effects μ_t . The error term is denoted by ε_{itb} and standard error estimates are clustered at the municipal level.

¹⁰ In our final sample, this applies to 26 municipalities.

We expect the sign of β_2 to be positive for at least three reasons: First, working hours and leisure activities were reduced due to the lockdown which reduces the opportunity costs of voting. Second, the mandatory postal voting is likely to decrease the costs of casting a ballot. Third, feelings of civic duty at the start of the crisis may include civic spirit considerations that lead to higher participation.

Identification Strategy (Part 2): Employing Instrumented Turnout to Explain Vote Shares

Analyzing the effect of turnout on the vote share of incumbents is usually prone to endogeneity issues from omitted variable bias, as turnout and vote shares may be affected by various aspects of competition or the valence of candidates which are commonly unobservable (see e.g., Grofman et al. 1999; Hansford and Gomez, 2010). For example, incumbents who performed badly or were even involved in a scandal may be subjected to able candidates in the next election and a high level of competition. Turnout is expected to be high in such elections. Particularly in local elections, one aspect of valence is the capacity to motivate voters to cast a ballot at all. Good administration and popularity in contrast may discourage able challengers to enter the election, leading to reduced competition and, consequently, less electoral participation. Overall, valence of candidates and competition are likely to correlate positively with turnout. Voting results of the incumbent negatively correlate with these factors. It is likely that incumbents achieve lower (higher) vote shares when competition is high (low) or more (less) able candidates run for election. Omitting the valence of candidates or political competition therefore leads to a relevant downward bias when estimating the effect of turnout on the vote share of the incumbent (Grofman et al., 1999).

To account for such endogeneity issues, we exploit variation in turnout that is exogenous to valence and competition. More specifically, we exploit the variation in turnout due to the state of emergency declared between the first and second ballot in 2020 of equation (1) as an instrument. We implement the following IV approach:

$$(2) \quad \text{Incumbent's vote share}_{itb} = \alpha_1 \widehat{\text{Turnout}}_{itb} + \alpha_2 \text{2nd ballot}_b \\ + \text{Covid-19}_{itb} \pi + X_{itb} \lambda + \varphi_i + \tau_t + v_{itb}$$

The dependent variable measures the *Incumbent's vote share* in municipality i , year t and ballot b . $\widehat{\text{Turnout}}$ is the predicted turnout from the difference-in-differences strategy of equation (1) which is implemented through a standard 2SLS, that is, our instrument is the interaction effect (*Election 2020 * 2nd ballot*). As before, we include an indicator variable for second ballots, a control for local exposure to *Covid-19*, a vector of municipality and ballot specific covariates X_{itb} , municipality fixed effects φ_i and year fixed effects τ_t .

To serve as a valid instrument, the interaction term in the first stage equation (1) needs to be correlated with *Turnout* (which will be shown). The instrument further needs to be orthogonal to the second stage error term v_{itb} , conditional on other covariates, that is, it may influence the *Incumbent's vote share* only via *Turnout*. The introduction of the state of emergency between first and second ballot was decided at the state level and can reasonably be assumed to be independent of specific municipal policies and incumbent's electoral results. The instrument therefore identifies variation in turnout that is unrelated to common sources of endogeneity like competition or the valence of candidates (e.g., Grofman et al., 1999; Hansford and Gomez, 2010). Regarding the exclusion restriction, we may separate the state of emergency from any direct effect of the pandemic: Both ballots in 2020 took place during the pandemic (the official declaration of the pandemic by the WHO was before the first ballot) such that time fixed effects capture effects of voting during a pandemic on incumbents' vote shares. Accounting for the local number of cases or fatalities additionally allows to control for potentially time variant effects of being locally exposed to Covid-19. It might be argued that policy measures enacted to slow down the spread of Covid-19 may affect voters' perceptions regarding local politics. However, one day after the first ballot, the Bavarian state government declared a state of emergency to centralize decision-making with respect to the pandemic. From that moment on, mayors and therefore incumbents who stand for re-election were not only

bound to the general instructions and decrees, but essentially lost decision-making competences related to the pandemic. In Bavaria, the Prime Minister Markus Söder (CSU) holds the perceived position of main actor in the crisis receiving approval in Bavaria for his policies during the state of emergency and the first wave.¹¹ Thus, rather than an incumbent from another party, we might expect candidates from the CSU to potentially profit from the state of emergency and voters' perceptions. We therefore include a control for the CSU as the party of the incumbent in our 2SLS regressions.

Finally, there is a theoretical econometric argument for our instrument (see Nunn and Qian, 2014; Aggeborn, 2016; Nizalova and Murtazashvili, 2016): The coefficient of an interaction term between an exogenous treatment variable and a potentially endogenous regressor is estimated consistently with OLS, if the exogenous treatment variable and an endogenous regressor are independent. This already holds for the interaction *Election 2020 * 2nd ballot* in the first stage such that from a theoretical econometric view our instrument should allow a consistent estimation of the causal effect of turnout on the incumbent's vote share.

All these arguments foster our assumption that the interaction term of equation (1) serves as a valid instrument to identify the effect of turnout in equation (2) on the vote share of incumbents.

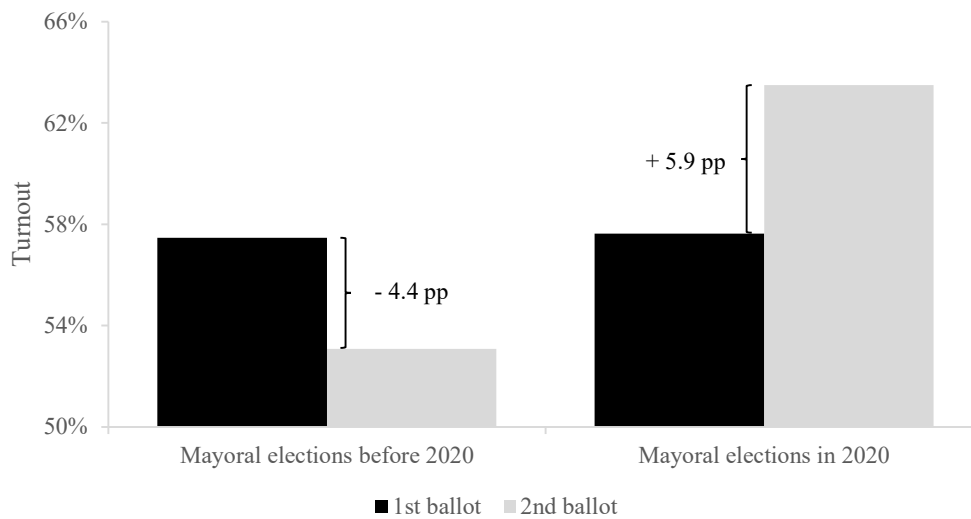
V. RESULTS

Establishing the Instrument

Figure 1 intuitively summarizes our identification strategy for the effect of the state of emergency on turnout.

¹¹ See, for example, an article in the online magazine of the Spiegel about Markus Söder as the main manager in the crisis in March 2020 (<https://www.spiegel.de/politik/deutschland/coronavirus-markus-soeder-als-krisenmanager-a-ab180d76-bf2a-45f5-bcc6-375ddf52b6a5>, accessed 01.06.2020) or survey results, according to which Markus Söder has become the most popular politician during the crisis in Germany (<https://www.oldenburger-onlinezeitung.de/nachrichten/umfrage-soeder-erstmal-beliebtester-politiker-deutschlands-36787.html>, accessed 01.06.2020).

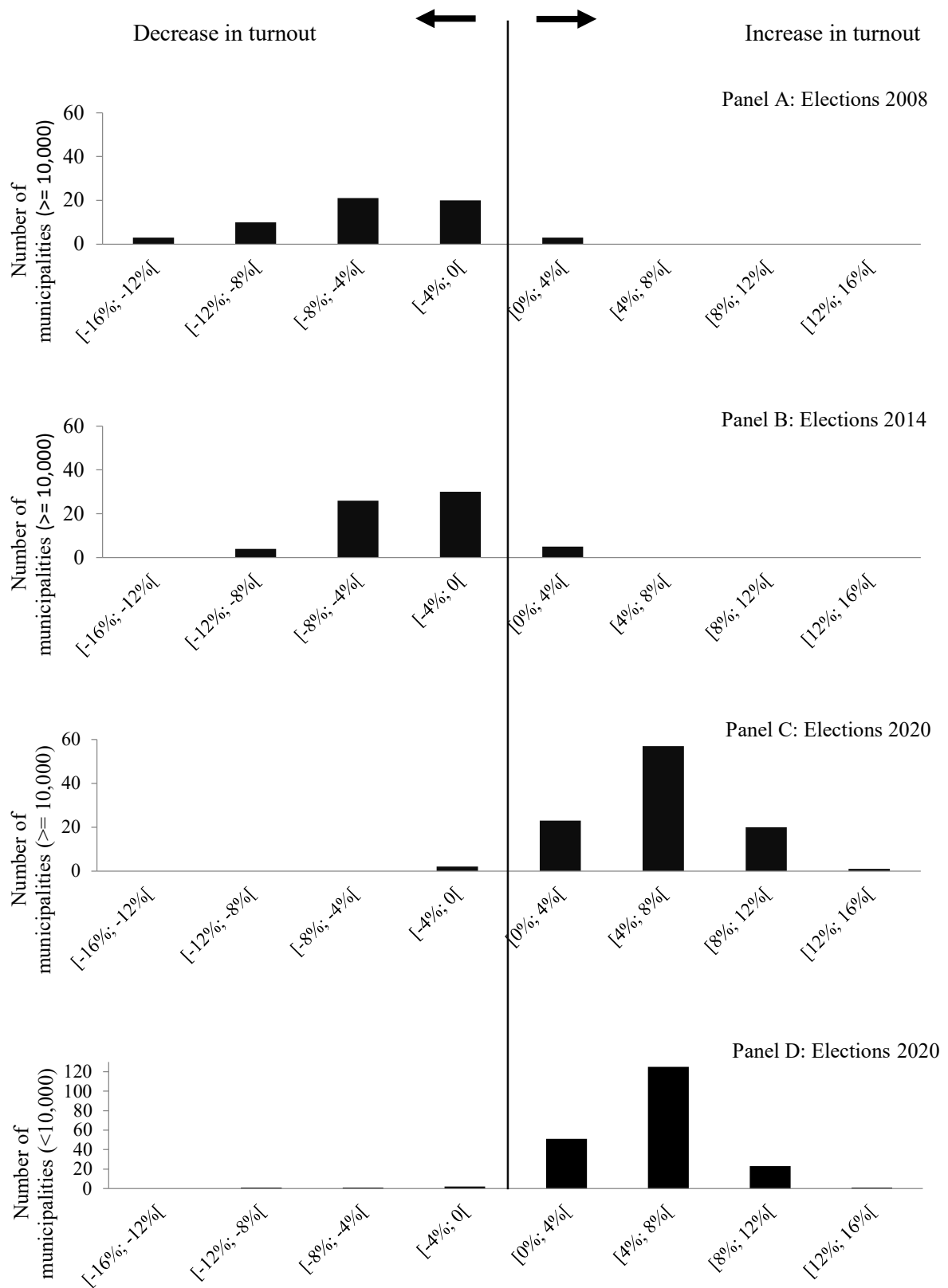
Figure 1 Average turnout in first and second ballots in 2020 and former mayoral elections



Turnout in the first ballot of 2020 is 57.6% on average and it increased by 5.9 percentage points to 63.5% in the second ballot. Turnout in previous first ballots was 57.5% on average (which is statistically identical to turnout in 2020), but turnout in previous second ballots was 53.1% and consequently 4.4 percentage points lower. The effect of the state of emergency on turnout or the *difference-in-differences* is a staggering $5.9\text{pp} - (-4.4\text{pp}) = 10.3\text{pp}$.

Panels A-C in Figure 2 show histograms for the change in turnout within municipalities from first to second ballot in 2008, 2014 and 2020. Turnout in second ballots generally decreased in 2008 and 2014. It is reasonable to assume that turnout would have evolved similarly in 2020 if the Bavarian state government had not introduced a state of emergency. In contrast, turnout in 2020 is systematically higher in second ballots across all but a handful of municipalities.

Figure 2 Change in turnout within municipalities between first and second ballot



Panel D shows changes in turnout in 2020 for all municipalities with less than 10,000 inhabitants which is very similar to the larger municipalities' histogram in 2020.¹²

Column (1) of Table 1 reports estimation results from a parsimonious model of equation (1) which only includes a dummy variable for the elections in 2020 and second ballots as well as the interaction term (*Election 2020 * 2nd ballot*) for the effect of the state of emergency. The results correspond fully to Figure 1.

Table 1 The effect of the state of emergency on turnout.

Dependent variable	Turnout			
	(1)	(2)	(3)	(4)
Election 2020	0.00167 (0.00647)			
2nd ballot	-0.0438*** (0.00284)	-0.0438*** (0.00285)	-0.0438*** (0.00286)	-0.0290*** (0.00610)
(Election 2020)*(2nd ballot)	0.102*** (0.00374)	0.0995*** (0.00418)	0.105*** (0.00394)	0.107*** (0.00387)
Cumulated Covid-19 infections		1.63e-05 (1.51e-05)	0.00060*** (0.000217)	0.00054*** (0.000201)
(Cumulated Covid-19 infections)*(2nd ballot)			-0.00057*** (0.000202)	-0.00052*** (0.000185)
Incumbent running				0.00518 (0.00516)
Effective candidates				0.00923*** (0.00287)
Female candidates				-0.00503 (0.00486)
Year fixed effects	No	Yes	Yes	Yes
Municipality fixed effects	No	Yes	Yes	Yes
Party controls	No	No	No	Yes
Observations	526	526	526	526
Adj. R ²	0.218	0.636	0.646	0.659

Notes: Year fixed effects include controls for the main elections 2008, 2014, and 2020. Rescheduled elections form the control group. Party controls include controls for candidates from the major parties CSU, SPD, BÜNDNIS90/DIE GRÜNEN, FREIE WÄHLER and FDP. Standard error estimates are clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

¹² We profit from data on turnout in small municipalities in the 2020 elections collected by the Ippen-Digital-Zentralredaktion and provided by the newspaper Merkur (<https://www.merkur.de/bayern/stichwahl-buergermeister-ergebnisse-kommunalwahl-2020-bayern-buergermeisterwahl-karte-13595420.html>). Comparing panel C and D suggests that voters in smaller municipalities reacted similarly to the state of emergency regarding turnout as voters in our sample of large municipalities.

The large and significant effect of the state of emergency on turnout remains if we add time and municipality fixed effects as well as the number of reported *Cumulated Covid-19 infections* at the county level (the variable is zero for the ballots prior to 2020) in column (2), allow *Cumulated Covid-19 infections* to have a differential impact on turnout in the first and second ballot in 2020 by introducing an interaction in column (3), and if we include further controls for parties, the number of *Effective candidates* and indicators for incumbents and female candidates in column (4). In the most complete model in column (4), the coefficient for the interaction term identifying the effect of the state of emergency on turnout corresponds to a 10.7 percentage points increase and is statistically highly significant. A 10.7 percentage points increase corresponds to 18.7% of the mean value of turnout (57.3%).

The effect of the state of emergency is statistically and quantitatively robust to the inclusion of further control variables like parallel elections, vote margins, fatalities from Covid-19, the use of municipality-year fixed effects, and the composition of the sample of municipalities over time (Table A3 and descriptions in the Appendix). Moreover, there is no evidence that the sample of municipalities holding a second ballot is affected by the pandemic (Table A4): Infections until the first ballot of 2020 did *not* systematically affect turnout of the first ballot and the winning vote margin in the first ballot, nor the probability of a second ballot. The direction and magnitude of the effect of the state of emergency on turnout is not restricted to our sample of municipalities (Table A5, columns 1 and 2): Turnout also increased by 11.5 percentage points for the 18 Bavarian counties that held second ballots during the state of emergency. Finally, there is no effect of the state of emergency on the share of invalid votes (Table A5, columns 3 and 4).

Table 2 Summary of subsample regressions regarding a potential heterogeneity of the effect of the state of emergency

			(1)	(2)	
	Sample split by variable	Sample	#Obs	Interaction term	90% confidence intervals
(1)	Vote margin in first ballot	(a) Vote margin in first ballot is smaller than median	262	0.106*** (0.0063)	[0.096; 0.117]
		(b) Vote margin in first ballot is larger than median	264	0.114*** (0.0058)	[0.104; 0.124]
(2)	Effective candidates	(a) Three or less effective candidates in first ballot	318	0.106*** (0.0047)	[0.098; 0.114]
		(b) Four or more effective candidates in first ballot	208	0.111*** (0.0078)	[0.098; 0.124]
(3)	CSU candidate	(a) No CSU candidate competes in second ballot	84	0.111*** (0.0069)	[0.100; 0.123]
		(b) CSU candidate competes in second ballot	442	0.107*** (0.0046)	[0.099; 0.114]
(4)	Incumbent	(a) Incumbent not competing in second ballot	298	0.101*** (0.0063)	[0.090; 0.111]
		(b) Incumbent competing in second ballot	228	0.112*** (0.0057)	[0.102; 0.121]
(5)	Experience of Incumbent	(a) No incumbent or incumbent with one tenure in second ballot	424	0.106*** (0.0040)	[0.099; 0.113]
		(b) Incumbent with at least two tenures in second ballot	102	0.109*** (0.0142)	[0.085; 0.132]

Notes: Every row shows regression results for two subsamples of the divided main sample. Column (1) reports the respective point estimates and standard error estimates for the main explanatory variable (*Election 2020*)*(2nd ballot) using the most stringent model as in Table (1) column (4). Column (2) presents the 90% confidence intervals. We drop the variable *Effective candidates* from row (2), the dummy variable for a CSU candidate competing in row (3) and the variable *Incumbent running* in rows (4) and (5).

Table 2 shows that the effect of the state of emergency is not heterogeneous with respect to various characteristics associated with competition and the valence of candidates. In row (1) and row (2), we split the sample according to the closeness of the election captured by vote margins in the first ballot and the number of effective candidates, respectively. Row (3) forms subsamples depending on whether voters have the option to elect a candidate from the dominant party (CSU) in the second ballot, as opposed to municipalities where the CSU candidate did not reach the second ballot. Row (4) investigates subsamples with and without incumbents competing in the second ballot. Row (5) explores subsamples according to the experience of incumbents. Results for all subsamples of Table 2 show that the effect of the state of emergency on turnout are as large and statistically significant as in our main regressions of Table 1.¹³ All point estimates in complementary subsamples have 90% confidence intervals that overlap. All results suggest that there are no heterogeneous effects of the state of emergency on turnout, that is, the difference-in-differences effect does not vary across subsamples regarding magnitude and statistical significance. This is reassuring for our instrumental variable strategy as the state of emergency induced increase in turnout is statistically unrelated to competition, valence, or candidates from the state-wide dominant party.

The Effect of Turnout on Vote Shares: Evidence from IV Estimates

To analyze whether incumbents profit from (an exogenous) increase in turnout, we use observations from first and second ballots of mayoral elections where the incumbent is running in the second ballot.

¹³ Table A6 in the Appendix shows further subsample regressions according to turnout, the size of municipalities and local exposure to Covid-19.

Panel A of Table 3 shows the conditional correlation of *Incumbent's vote share* and *Turnout* from OLS regressions. Panel B reports the second stage results of an IV regression employing the state of emergency as an instrument for turnout. Panel C shows the respective first stage regression result for the instrument.¹⁴

Table 2 The Effect of *Turnout* on *Incumbent's vote share* – 2SLS estimates.

Dependent var. (panels A and B)	Incumbent's vote share					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: OLS estimates</i>						
Turnout	-0.157 (0.106)	-0.275* (0.142)	-0.238* (0.129)	-0.147 (0.137)	-0.238* (0.129)	-0.147 (0.137)
Adj. R ²	0.480	0.518	0.543	0.569	0.543	0.569
<i>Panel B: 2SLS estimates</i>						
Turnout (instrumented)	0.337*** (0.118)	0.340** (0.171)	0.338** (0.171)	0.343** (0.161)	0.318* (0.171)	0.332** (0.161)
<i>Panel C: First-stage estimates</i>						
Dependent variable (panel C)	Turnout					
(Election 2020)*(2nd ballot)	0.107*** (0.00586)	0.109*** (0.00735)	0.110*** (0.00739)	0.111*** (0.00752)	0.110*** (0.00735)	0.111*** (0.00748)
(Cumulated Covid-19 infections)*(2nd ballot)					0.000300 (0.00050)	0.000184 (0.00047)
<i>F</i> -statistic	331.6	218.9	221.6	216.4	114.0	111.4
Hansen <i>J</i> -statistic (<i>p</i> -value)					0.151	0.156
Controls (for all panels):						
2 nd ballot	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Covid-19 related controls	No	Yes	Yes	Yes	Yes	Yes
Personal controls	No	No	Yes	Yes	Yes	Yes
Election related controls	No	No	No	Yes	No	Yes
Observations	228	228	228	228	228	228

Notes: Year fixed effects include controls for the main elections 2014 and 2020. Elections from other years form the control group. Covid-19 related controls include the variables *Cumulated Covid-19 infections* and *Fatalities from Covid-19*. Personal controls include controls for the incumbent's *Gender* and *Tenure*. Election related controls include *Effective candidates*, *Election county administrator* and *Incumbent is from CSU*. Standard error estimates are clustered at the municipality level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

¹⁴ As in Table 1, the point estimates indicate that the state of emergency leads to a statistically significant increase in turnout of about 10.7 percentage points. The first stage *F*-statistic for the excluded instrument suggests that the interaction term is *not* a weak instrument.

In column (1), the OLS results would indicate a negative but statistically insignificant association, that is, the incumbent's vote share tends to be low when turnout is high. However, OLS results suffer from omitted variable bias (Grofman et al., 1999) that induces a negative bias between turnout and an incumbent's vote share, as discussed above. Thus, IV results are necessary to obtain consistent estimates. IV estimates in panel B show that the sign for the effect of an (exogenous) increase in turnout is *positive* and statistically significant in specification (1). In terms of magnitude, an increase in *Turnout* of 10 percentage points leads to an increase in *Incumbent's vote share* by 3.37 percentage points which is quantitatively sizable for mayoral second ballots.

We add the cumulated number of infections and an indicator for fatalities related to Covid-19 at the county level in column (2). In column (3), we include controls for the incumbent's gender and tenure. The negative coefficients for the effect of *Turnout* on *Incumbent's vote share* from OLS regressions in panel A increase in absolute terms and turn statistically significant at the 10%-level. In contrast, the IV results remain *positive* and statistically significant. The magnitude of the effect of an increase in turnout is similar to column (1). Thus, incumbents actually benefit from an exogenous increase in turnout.

In column (4), we control for parallel elections at the county level and the incumbent's party. As soon as we add the number of effective candidates as additional control, the point estimate from OLS regressions decreases in absolute terms and becomes statistically insignificant. This is suggestive for the relevance of competition as a potential omitted variable when estimating the association of turnout on incumbents' vote share when taking account of endogeneity issues. However, the number of effective candidates does not seem capture all aspects of competition or the valence of candidates as there is still a substantial downward bias of OLS estimates. The second stage IV results remain as in previous specifications, that is,

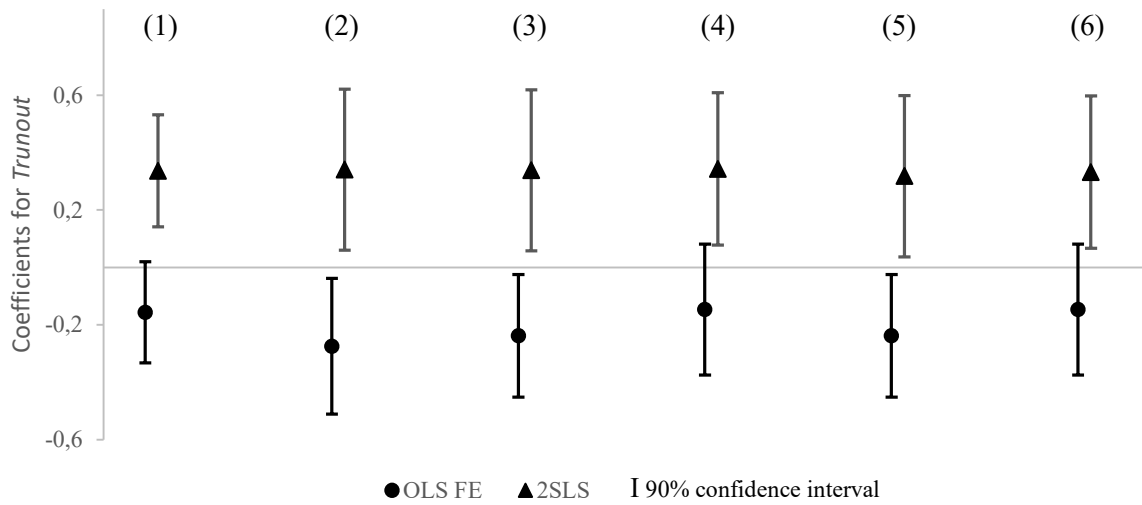
instrumented turnout has a statistically significant and positive effect on the vote share of the incumbent.

In columns (5) and (6), we introduce *Cumulated Covid-19 infections* interacted with *2nd ballot* as an additional second instrument for *Turnout*. First stage results suggest that the effect of a rising cumulated number of infections on turnout is slightly larger in the 2nd ballot, but the estimate for this interaction is statistically insignificant.¹⁵ A second instrument allows us to conduct a Sargan-Hansen test of overidentifying restrictions as an econometric test for exogeneity. We do not reject the null hypothesis that the instruments are uncorrelated with the error term. Thus, next to arguments provided for our identification strategy, standard econometric tests are suggestive that our IV setting gives a causal estimate of the effect of *Turnout* on *Incumbent's vote share*. Second stage results closely resemble those in columns (3) and (4), that is, they suggest a positive and statistically significant effect of *Turnout* on *Incumbent's vote share*.

Overall, columns (1)-(6) point to a substantial downward bias of OLS regression results, potentially due to omitted variables such as valence or competition (Grofman et al., 1999). Figure 3 provides a graphical illustration of this downward bias: OLS estimates and respective confidence intervals are always smaller than results from 2SLS estimations. IV results are remarkable similar across all specifications. If turnout increases due to reasons unrelated to political events (such as the state of emergency), our results suggest that incumbents profit from higher voter participation. A 10 percentage point increase in turnout leads to roughly a 3.4 percentage point increase in the vote share of the incumbent.

¹⁵ Note that the second instrument compares to the number of infected persons being interacted with (*Election 2020*)*(*2nd ballot*) as there were always zero infected persons in years before 2020. If we believe the pandemic and the state of emergency to be exogenous from local politics, the interaction term should be suitable as an additional instrument.

Figure 3 Graphical illustration of omitted variable bias: *OLS FE estimates* and *2SLS estimates* from Table 3 for the effect of *Turnout* on *Incumbent's vote share*



It seems reasonable that incumbents profit from exogenously higher turnout in the context of mayoral elections: If turnout increases due to reasons unrelated to valence or political competition, occasional voters are likely to have cast a ballot. Note that due to the state of emergency *more* voters participated in the second ballot in 2020 than in first ballot which is uncommon. Occasional voters are likely to be less familiar with the candidates than voters who have already voted in the first ballot. Such voters tend to be rather uninformed and may therefore be more likely to use cues like incumbency (e.g., Hodler et al., 2015).

Heterogenous Effects of Turnout

We study whether there are heterogenous effects of an exogenous increase in *Turnout* on the *Incumbent's vote share* in Table 4.

Table 4 The Heterogeneity of the Effect of *Turnout* on *Incumbent's vote share* – 2SLS estimates.

Dependent variable	Incumbent's vote share				
	(1) Vote margins	(2) Incumbent from CSU	(3) Experience	(4) Fatalities from Covid-19	(5) Female incumbent
Turnout	0.560** (0.244)	0.619*** (0.205)	0.359** (0.175)	0.279* (0.147)	0.402** (0.165)
Turnout*Indicator	-0.361 (0.277)	-0.553** (0.249)	-0.0296 (0.252)	-0.285 (0.242)	-0.471** (0.220)
1 st <i>F</i> -statistics (first stage)	116.6	116.3	107.7	187.8	106.8
2 nd <i>F</i> -statistics (first stage)	150.4	85.79	72.47	154.5	83.42
Controls:					
2 nd ballot	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes
Covid-19 related controls	Yes	Yes	Yes	Yes	Yes
Personal controls	Yes	Yes	Yes	Yes	Yes
Election related controls	Yes	Yes	Yes	Yes	Yes
Observations	228	228	228	228	228
Indicator:					
Column (1): Vote margins	Indicator = 1 in first ballot and runoff election if vote margin in first ballot is lower than median; = 0 otherwise				
Column (2): Incumbent from CSU	Indicator = 1 if incumbent is from CSU; = 0 otherwise				
Column (3): Experience	Indicator = 1 if incumbent has experience from at least two tenures; = 0 otherwise				
Column (4): Fatalities from Covid-19	Indicator = 1 for first ballot and runoff election 2020 if there has been at least one fatality from Covid-19 in county until the runoff election in 2020; = 0 otherwise				
Column (5): Female incumbent	Indicator = 1 if incumbent is female; = 0 otherwise				

Notes: 2SLS estimates are shown for the two endogenous variables *Turnout* and *Turnout*Indicator*. *Indicator* is a placeholder for five dummy variables as defined above to explore the heterogeneity of the effect of (exogenous) *Turnout* on *Incumbent's vote share*. *(Election 2020)*(2nd ballot)* and *(Election 2020)*(2nd ballot)*(Indicator)* are used as instruments. Year fixed effects include controls for the main elections 2014 and 2020. Elections from other years form the control group. Covid-19 related controls include the variables *Cumulated Covid-19 infections* and *Fatalities from Covid-19*. Personal controls include controls for the incumbent's *Gender* and *Tenure*. Election related controls include *Effective candidates*, *Election county administrator* and *Incumbent is from CSU*. We omit *Tenure* in column (3), *Fatalities from Covid-19* in column (4) and *Gender* from column (5). First stage *F*-statistics for the excluded instruments are reported. The first *F*-statistic is from the first stage regression with *Turnout* as the dependent variable and the second *F*-statistic from the first stage with *(Turnout*Indicator)* as the dependent variable. Standard error estimates are clustered at the municipality level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

To study whether incumbents' electoral success varies depending on the level of competition in the mayoral election, we include an interaction term in our 2SLS setting and interact *Turnout* with a binary *Indicator* variable for a competitive environment. The indicator takes a value of one if the vote margin in the first ballot of a mayoral election is below the median of first ballots' vote margins and zero otherwise.¹⁶ Specification (1) shows that the coefficient for *Turnout* is positive and statistically significant as before. The coefficient for *Turnout* interacted with the *Indicator* for competition is negative but statistically insignificant. Nevertheless, as the interaction term is comparatively large, this may suggest that the effect of higher turnout on the incumbent's vote share could be partly mitigated when competition is high. Calculating the total effect of an increase in turnout when competition is high (coefficient *Turnout* plus coefficient *Turnout*Indicator*), we find that the effect of turnout on the vote share of the incumbent when competition is high is positive (+0.200) but not statistically different from zero (se = 0.163). This may suggest that when first round elections were particularly competitive, even occasional voters may be better informed about candidates' characteristics so that they do not only rely on incumbency as a cue which mitigates the positive effect of turnout for the incumbent. Conversely, in uncompetitive environments, an exogenous increase in turnout by 10 percentage points leads to a 5.6 percentage points higher vote share for the incumbent.

Regarding party affiliation of incumbents to the state-wide dominant, center-right CSU party, we find that incumbents from parties different to CSU profit from higher turnout (column 2). For incumbents from the CSU, no such relationship exists, and the total effect (coefficient *Turnout* plus coefficient *Turnout*Indicator*) is almost zero (+0.066) and statistically insignificant (se = 0.187). This finding is consistent with other evidence that particularly left-

¹⁶ Empirically, we employ the triple interaction of the binary variable for the level of competition interacted with (*Election 2020*)*(2nd ballot) as a second instrument besides the interaction term for the state of emergency itself.

wing parties tend gain from higher turnout (e.g., Hansford and Gomez, 2010; Finseraas and Vernby, 2014; Arnold and Freier, 2016).

There is no evidence that points to a heterogeneity of the effect of turnout with respect to the experience of the incumbent as shown in column (3). More and less experienced incumbents tend to gain from higher turnout. Being longer in office is therefore no additional advantage when turnout increases due to reasons unrelated to electoral competition.

Regarding other potential heterogeneities we note that the interaction between turnout and an indicator for fatalities from Covid-19 at the county level is not statistically significant (column 4).¹⁷ Interestingly, higher turnout has only an effect for male incumbents but not for female incumbents as shown in specification (5): The interaction term for female incumbents is negative and of similar size as the baseline effect of turnout. The total effect of higher turnout for female incumbents is -0.068 and statistically insignificant ($se = 0.227$). Thus, male incumbents profit particularly from increases in turnout that are unrelated to valance or political competition.

VI. CONCLUSIONS

We analyze the effect of a turnout on the success of incumbents running for reelection, leveraging the two-round system (runoff) mayoral election in Bavaria held *during* a state of emergency for our study. Having declared a state of emergency *after* the first ballot in 2020, state authorities centralized all relevant decision-making *prior* to the second ballot and introduced lockdown measures. State policies aimed at controlling the spread of the pandemic are credibly independent from municipal politics and characteristics of local politicians. Employing a difference-in-differences setting to contrast turnout in the first and the second ballots, we find a statistically significant and positive effect – amounting to more than 10

¹⁷ The total effect of higher turnout in a situation where there are fatalities related to the pandemic (Turnout plus Turnout * Indicator) is close to zero and statistically insignificant.

percentage points – of the state of emergency on turnout in municipal elections. We employ this increase in turnout as an instrument to explain vote shares of incumbents in the second ballot.

Analyzing the effect of turnout on voting outcomes is prone to endogeneity issues due to omitted variable bias (e.g., Grofman et al., 1999; Hansford and Gomez, 2010 Martins and Veiga, 2014). Using higher turnout due to the state of emergency as an instrument, we find a positive effect of turnout on vote shares of incumbents: a ten percentage point increase in turnout translates into a 3.4 percentage point increase of the incumbent's vote share. This effect of turnout on the vote share of incumbents is intuitive: If – due to reduced costs of voting – substantially more voters cast a ballot in a second round than in the first round, such voters are likely to be less familiar with municipal politics. Instead of gathering information on the complexity of local issues, they may use shortcuts to come to a decision (Stadelmann and Torgler, 2013). Voting for somebody you know, that is, voting for the incumbent, is a simple shortcut. More generally, our results provide evidence that incumbents profit from a sudden, unexpected rise in turnout that is unrelated to political competition or valence of candidates.

Our analysis also contributes to research investigating the determinants of turnout in times of crisis (e.g., Bechtel and Hainmueller 2011; Sinclair et al., 2011; Bodet et al., 2016; Fair et al., 2017; Lasala-Blanco et al., 2017; Rudolph and Kuhn, 2017). Our paper distinguishes itself from that literature as we do not analyze elections in the aftermath of a natural disaster but voting *during* a state of emergency. One factor that may explain the increase in turnout in the mayoral elections during the state of emergency could be that the state government closed polling stations and voting in person was prohibited while only postal voting remained possible. In addition, opportunity costs of voting further decreased as most alternative activities were impossible during the lockdown. Finally, higher turnout during the state of emergency

might also be due to an increased sense of civic spirit and trust during a (at the start) non-political crisis and a disaster (Toya and Skidmore, 2014; Bol et al., 2020).

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ONLINE APPENDIX

Table A1 Summary Statistics

Variable	Dummy	Obs.	Mean	Std. Dev	Min	Max
<i>Dependent variables</i>						
Turnout	No	526	0.573	0.0764	0.343	0.776
Incumbent's vote share	No	228	0.452	0.0922	0.195	0.717
<i>Covid-19 related controls</i>						
Cumulated Covid-19 infections	No	526	39.92	131.0	0	2,078
Lagged cumulated Covid-19 infections	No	526	35.66	114.3	0	1,839
Fatalities from Covid-19	Yes	526	0.103	0.304	0	1
<i>Control variables</i>						
Incumbent running	Yes	526	0.452	0.498	0	1
Effective candidates	No	526	2.658	0.812	2	5
Female candidates	Yes	526	0.517	0.500	0	1
Election county administrator	Yes	526	0.492	0.500	0	1
Election state	Yes	526	0.002	0.0436	0	1
Winning vote margin	No	526	0.133	0.104	0.0003	0.604
Eligible voters in thousands	No	478	31.27	104.0	7.551	1,111
Candidate from CSU	Yes	526	0.916	0.277	0	1
Candidate from SPD	Yes	526	0.741	0.438	0	1
Candidate from FREIE WÄHLER	Yes	526	0.186	0.390	0	1
Candidate from Bündnis90/Die Grünen	Yes	526	0.325	0.469	0	1
Candidate from FDP	Yes	526	0.181	0.385	0	1

Table A2 The number of municipalities with second ballots by region and year

year region	Rescheduled election	2008	2014	2020	Total
Oberbayern	18	24	29	49	120
Niederbayern	4	4	6	12	26
Oberpfalz	1	3	4	6	14
Oberfranken	5	2	3	7	17
Mittelfranken	5	13	7	14	39
Unterfranken	2	7	7	4	20
Schwaben	3	4	9	11	27
Total	38	57	65	103	263

Table A3 Testing for the robustness of the effect of the state of emergency on turnout

Dependent variable	Turnout					
	(1) Further controls	(2) Fatalities	(3) Lagged infection numbers	(4) Municip. year dummies	(5) Only 2014 and 2020 elections	(6) Municip. with 2nd ballots in both 2014 and 2020
2nd ballot	-0.0253*** (0.00622)	-0.0290*** (0.00608)	-0.0290*** (0.00611)	-0.0189*** (0.00475)	-0.0116** (0.00548)	-0.0107 (0.00875)
(Election 2020)*(2nd ballot)	0.108*** (0.00423)	0.105*** (0.00585)	0.107*** (0.00392)	0.111*** (0.00382)	0.102*** (0.00373)	0.0950*** (0.00608)
Cumulated Covid-19 infections	0.0005** (0.000186)	0.0005*** (0.000201)		0.0002 (0.000201)	0.0004*** (7.15e-05)	0.0003*** (5.95e-05)
(Cumulated Covid-19 infections)*(2nd ballot)	-0.0005*** (0.000171)	-0.0005*** (0.000185)		-0.0002 (0.000183)	-0.0003*** (6.90e-05)	-0.0003*** (5.60e-05)
Incumbent running	0.00132 (0.00569)	0.00529 (0.00517)	0.00529 (0.00515)	-0.000347 (0.00725)	-0.00716 (0.00684)	-0.00740 (0.00719)
Effective candidates	0.00816*** (0.00280)	0.00927*** (0.00288)	0.00922*** (0.00285)	0.0140*** (0.00259)	0.0135*** (0.00325)	0.0146** (0.00579)
Female candidates	-0.00310 (0.00448)	-0.00512 (0.00493)	-0.00495 (0.00487)	-0.00105 (0.00364)	0.00133 (0.00448)	-0.00269 (0.00718)
Election county administrator	0.00441 (0.00501)					
Election state	0.0376*** (0.00568)					
Winning vote margin	-0.00993 (0.0178)					
Eligible voters in thousands	-3.14e-05 (0.00135)					
Fatalities from Covid-19		0.00301 (0.00752)				
Lagged cumulated Covid-19 infections			0.0007*** (0.000254)			
(Lagged cumulated Covid-19 infections)*(2nd ballot)			-0.0007*** (0.000234)			
Year fixed effects	Yes	Yes	Yes	No	Yes	Yes
Municipality fixed effects	Yes	Yes	Yes	No	Yes	Yes
Party controls	Yes	Yes	Yes	Yes	Yes	Yes
Municipality year fixed effects	No	No	No	Yes	No	No
Observations	478	526	526	526	336	148
Adj. R ²	0.718	0.658	0.659	0.752	0.839	0.832

Notes: Year fixed effects include controls for the main elections 2008, 2014, and 2020. Rescheduled elections form the control group. Party controls include controls for candidates from the major parties CSU, SPD, BÜNDNIS90/DIE GRÜNEN, FREIE WÄHLER and FDP. Standard error estimates are clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

In table A3 we explore further election related covariates like parallel elections, winning vote margins as a measure for political competition, and the number of eligible voters in thousands. We also include an indicator variable for fatalities from Covid-19 at the county level to account for this dimension of the pandemic. As elections take place on Sundays, reporting

of new infections might be delayed. We thus employ the lagged cumulated number of persons infected with Covid-19 in one specification. The effect of the state of emergency on turnout remains positive, statistically significant, and almost identical in magnitude as in Table 1 (columns 1-3). The two-tiered structure of mayoral elections allows us to use municipality-year fixed effects (column 4). The point estimate of the interaction term becomes, if anything, slightly larger.

Our analysis is restricted by design to municipalities that hold a second ballot. The estimated effect of the state of emergency on turnout does not depend on the changing composition of municipalities with second ballots. If we drop all observations from mayoral elections except those in 2014 and 2020, our results remain robust in terms of statistical significance and magnitude (column 5). If we keep only municipalities that hold a second ballot both in 2014 and 2020, our results again remain robust in terms of statistical significance and magnitude of the effect in this balanced sample.

Table A4 Estimating the effect of local exposure to Covid-19 in the first ballot of the mayoral election on different electoral outcomes

Dependent variable	Turnout	Second ballot is needed (LPM)	Winning vote margin
	(1)	(2)	(3)
(At least one Covid-19 infection)* (Elections 2020)	0.00916 (0.00694)	0.00132 (0.0763)	-0.0329 (0.0383)
Year fixed effects	Yes	Yes	Yes
Municipality fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	653	653	653
Adj. R ²	0.433	0.499	0.462

Notes: This table shows the regression results for the model $Turnout_{it} = \alpha + \beta(At\ least\ one\ Covid-19\ infection_i) * (Elections\ 2020_t) + \delta_i + \mu_t + v_{it}$ for observations from first ballots only. Year fixed effects capture election specific characteristics and municipality fixed effects capture municipality specific characteristics that are constant over time. Controls include the variables *Incumbent running*, *Effective candidates*, *Female candidates*, *Election county administrator*, *Winning vote margin* (not in column (3)), *Eligible voters* and controls for the parties of the competing candidates. Year fixed effects include controls for the electoral years 2020, 2014 and 2008. Standard error estimates are clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

In Table A4, we exploit the fact that some counties reported zero infected persons at the time of the first ballot in a difference-in-differences setting concentrating on first ballots only (see also Blesse et al. 2020). Column (1) shows that having at least one infection at the county level is positively associated with turnout, although not at statistically significant levels. Having an infection at the time of the first ballot in 2020 does not alter the probability of no candidate achieving a majority, nor the winning vote margins (columns (2) and (3)). Thus, there is no evidence that the sample of municipalities holding a second ballot is affected by the local exposure to the pandemic in the first ballots in 2020.

Table A5 The effect of the state of emergency on turnout in a sample of Bavarian counties and the effect of the state of emergency on the share of invalid votes.

Sample	Bavarian counties		Municipalities	
Dependent variable	Turnout		Share of invalid votes	
	(1)	(2)	(3)	(4)
2nd ballot	-0.133*** (0.0105)	-0.122*** (0.0164)	-0.00171*** (0.000461)	-0.00526*** (0.000748)
(Election 2020)*(2nd ballot)	0.120*** (0.0147)	0.115*** (0.0170)	0.000204 (0.000847)	-0.000386 (0.000823)
Cumulated Covid-19 infections	0.000580* (0.000311)	0.000670 (0.000430)	-1.57e-05 (1.40e-05)	-1.67e-05 (1.38e-05)
(Cumulated Covid-19 infections)*(2nd ballot)	-0.000515* (0.000258)	-0.000705 (0.000419)	2.03e-05 (1.60e-05)	2.12e-05 (1.57e-05)
Incumbent running		0.0161 (0.0104)		-0.000134 (0.000495)
Effective candidates		0.00374 (0.00918)		-0.000786* (0.000422)
Female candidates		-0.00186 (0.0112)		-0.000198 (0.000436)
Year fixed effects	Yes	Yes	Yes	Yes
Municipality fixed effects	No	No	Yes	Yes
County fixed effects	Yes	Yes	No	No
Party controls	No	Yes	No	Yes
Observations	114	114	480	480
Adj. R ²	0.853	0.889	0.0782	0.190

Notes: Year fixed effects include controls for the main elections 2008, 2014, and 2020. Rescheduled elections form the control group. Party controls include controls for candidates from the major parties CSU, SPD, BÜNDNIS90/DIE GRÜNEN, FREIE WÄHLER and FDP. Standard error estimates are clustered at the county level in columns (1) and (2) and municipality level in columns (3) and (4). *** p<0.01, ** p<0.05, * p<0.1

In Table A5 we explore the effect of the state of emergency on counties. Reports from the Bavarian State Agency for Statistics include results from the parallel elections for the county commissioner from *all* 71 counties besides the mayoral election results. County commissioners are elected in similar two-round (runoff) elections by majority rule so that 18 counties had a second ballot for the county commissioner during the state of emergency. Employing the same estimation strategy, columns (1) and (2) of Table A5 in the Appendix show that the state of emergency's effect on turnout is 11.5 percentage points in the sample of Bavarian counties with runoff elections.

For the sample of municipalities, column (3) and (4) further show that the share of invalid votes in the elections during the state of emergency is unaffected. This suggests that the share of voters who seriously cast their ballot for one of the eligible candidates is similar to other elections despite the lower voting costs.

Table A6 Summary of further subsample regressions with regard to potential heterogeneity of the effect of the state of emergency

Sample split by variable			Sample	#Obs	(1) Interaction term	(2) 90% confidence intervals
(1)	Turnout	(a) Turnout in first ballot is lower than median	264	0.108*** (0.0058)	[0.098; 0.118]	
		(b) Turnout in first ballot is higher than median	262	0.109*** (0.0075)	[0.096; 0.121]	
(2)	Turnout	(a) Turnout in second ballot is lower than median	264	0.093*** (0.0091)	[0.078; 0.108]	
		(b) Turnout in second ballot is higher than median	262	0.101*** (0.0053)	[0.092; 0.110]	
(3)	District-free cities	(a) District-free cities	70	0.092*** (0.0117)	[0.072; 0.112]	
		(b) Cities belonging to a county	456	0.108*** (0.0054)	[0.099; 0.116]	
(4)	Eligible voters	(a) Number of eligible voters lower than median	240	0.102*** (0.0062)	[0.091; 0.112]	
		(b) Number of eligible voters higher than median	238	0.116*** (0.0061)	[0.106; 0.126]	
(5)	Covid-19 infections in county	(a) No Covid-19 infection until election day of first ballot	68	0.109*** (0.0137)	[0.086; 0.133]	
		(b) At least one Covid-19 infection until election day of first ballot	458	0.104*** (0.0040)	[0.097; 0.111]	
(6)	Increase in Covid-19 infections in county	(a) Increase in Covid-19 infections smaller than 100	234	0.096*** (0.0051)	[0.087; 0.104]	
		(b) Increase in Covid-19 infections equal or larger than 100	292	0.111*** (0.0054)	[0.102; 0.120]	
(7)	Fatalities from Covid-19 in county	(a) No fatality until election day of second ballot	224	0.101*** (0.0071)	[0.089; 0.113]	
		(b) At least one fatality until election day of second ballot	302	0.106*** (0.0046)	[0.099; 0.114]	

Notes: Every row shows regression results for two subsamples of the divided main sample. Column (1) reports the respective point estimates and standard error estimates for the main explanatory variable (*Election 2020*)*(2nd ballot) using the most stringent model as in Table (1) column (4). Column (2) presents the 90% confidence intervals. We drop the variables *Cumulated Covid-19 infections* and (*Cumulated Covid-19 infections*)*(2nd ballot) from our model in rows (5)-(7).

In rows (1) and (2), we split our main sample in subsamples according to median turnout in the first ballot and turnout in the second ballot, respectively. In rows (3) and (4), we analyze whether the effect of the state of emergency is different in larger cities using the status as district-free city, and we explore a subsample employing the number of eligible persons as a criterion. In rows (5)-(7), we consider local exposure to Covid-19 as a potential source of heterogeneity and separate subsamples according to the initial number of infections in the first ballot (row 5), the absolute increase in infections between the two electoral dates (row 6), and whether fatalities are reported in the county before the second ballot (row 7).