Voter Turnout and City Performance: Evidence from Italian Municipalities

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Abstract

Using data on mayoral elections in large Italian cities during the 2000s, we investigate whether and how voter turnout affects city performance across a number of dimensions. To address the issue of voter turnout endogeneity and identify the transmission mechanism, we exploit exogenous variation in participation rates in mayoral elections due to anticipated shocks (concurrence of local and national elections) and unanticipated shocks (bad weather on the day of the election) to the cost of voting. The results consistently point to a negative impact of voter turnout rates on indicators of urban environmental performance, life quality, and administrative efficiency. Interestingly, though, we find that only anticipated shocks to turnout affect the quality of elected mayors measured on a number of competence dimensions, compatibly with the hypothesis of a selection mechanism whereby parties choose candidates to maximize their chances of winning the elections based on their expectations on voter turnout rates.

JEL classification: D72; H72; C26.

Key words: voter turnout; urban performance; concurrent elections; weather.

1. INTRODUCTION

To what extent the rate of voter turnout influences the nature and quality of the policies that are subsequently implemented by the elected governments is an issue that has been attracting increasing interest in the past couple of decades. The empirical evidence on the policy impact of the rate of turnout in democratic elections is far from conclusive, though. Early cross-country studies (Mueller and Stratmann, 2003; Fumagalli and Narciso, 2012) showed that higher turnout rates tended to be accompanied by higher redistribution and by the implementation of policies that retard growth. However, a number of more recent works (Fowler, 2013; Rauh, 2015; Fujiwara, 2015; Leon, 2017) stress the contribution of higher voter turnout to fill the 'democratic deficit' in poor participation contests and benefit minority and disadvantaged groups. Still other pieces of empirical research challenge the low turnout-poor democracy postulate itself, and question the very relevance for policy of an increase in voter turnout *per se* (Lutz and Marsh, 2007), finding little or no effect of even massive changes in turnout on government spending level or composition (Hoffman et al., 2017).

As far as local elections are concerned, Hajnal and Trounstine (2005) provide evidence that the less regular voting participation of minority groups leads to their systematic under-representation on US city governing bodies, and that moving the dates of local elections to coincide with national contests would substantially moderate such phenomenon. Geys et al. (2010) find larger turnout rates in German municipal elections to be associated with higher efficiency in the provision of local public services. By analyzing school district

elections in a number of US states and exploiting the exogenous timing of election schedules, Anzia (2011; 2012) shows that low turnout (off-cycle) elections create a strategic opportunity for organized groups (public sector unions) to pursue their private interests (raising public sector salaries). Aggeborn (2016) uses a constitutional change as an instrument for voter turnout in Swedish local elections, and finds that higher voter turnout yields higher municipal taxes, larger local public expenditures, and lower vote shares for right-wing parties. Finally, Funk (2010) and Hodler et al. (2015) study the effect of a reduction in the cost of voting due to the introduction of optional postal voting in Switzerland, and show that the associated lower turnout has negative effects on education and welfare expenditures.

This paper aims at investigating empirically the channel of transmission from voter turnout to the performance of government. To do so, it uses data on mayoral elections in large Italian cities and exploits for the first time exogenous variation in voter turnout rates in mayoral elections due to two distinct perturbations – anticipated shocks (concomitance of local and national elections) *versus* unanticipated shocks (bad weather on election day) – to the cost of voting. The idea is to study the potentially different consequences of these two kinds of shocks. When the shock to turnout is anticipated, for instance because it is known in advance that a municipal election will be held simultaneously as a national parliamentary one boosting turnout for all races on the ballot, political parties will select mayoral candidates that have the largest chances of winning the election given the expected high rate of turnout. On the other hand, an unanticipated shock to turnout (e.g., weather

conditions on the day of the election) will either favor candidates with different characteristics, conditional on the pool of candidates, or alter their incentives once elected. The availability of these two distinct sources of exogenous variation in turnout rates along with information on a number of mayoral candidates' traits (education, professional status) and indicators of public policy performance (environmental performance, quality of life indices, administrative efficiency proxies) allows us to test different hypotheses about the channel through which turnout rates have an impact on policy outcomes.

The results of the empirical analysis can be summarized as follows. First, the evidence consistently points to a negative impact of voter turnout rates on all measures of city performance, whether changes in voter turnout are provoked by anticipated or unanticipated shocks to the cost of voting. However, we find that only voter turnout changes due to anticipated shocks to the cost of voting (concomitant elections) influence the quality of the elected mayors. This result is compatible with the hypothesis of a party selection mechanism, whereby races that are expected to have more diffuse turnout tend to lead to the selection of mayors that are less educated and have lower professional status, with a subsequent negative impact on the performance of cities.

The paper is organized as follows. We introduce the identification strategy and the empirical model in section **2**, and illustrate the dataset and institutional context in section **3**. Section **4** reports the estimates of the impact of voter turnout on city performance. Section **5** tackles the issue of politicians' quality determination and discusses other potential mechanisms of transmission of voter turnout to city performance. Finally, section

6 concludes.

2. EMPIRICAL STRATEGY

Let π_{nt} be an indicator of performance of city $n = 1, \dots, N$ at a given point in time t, and let the government (mayor) in office in city n at time t be elected at time $t_n = t - \Delta t_n$, where $1 \leq \Delta t_n < \overline{\Delta t}$ is the 'seniority' of the mayor, and $\overline{\Delta t}$ is the statutory length of the term of office. At the election held at time t_n, turnout $\tau_{nt_n}$was observed in city n. Our research question is whether the rate of turnout that was registered at the time t_n election has an impact on the subsequent performance of the city (π_{nt}). To address that question, let us start from equation (1) below, that allows the city performance indicator to be a function of the turnout rate that was registered in the year of the election:

$$\pi_{nt} = \pi\left(\tau_{nt_n}\right) \tag{1}$$

In principle, the rate of turnout can have an impact on the subsequent performance of a city in either of the following two ways. First, the turnout rate might affect performance indirectly, that is, through the quality of mayoral candidates that happen to be elected (term $q(\tau_{nt_n})$ in equation (2) below) and are responsible for setting the policy that eventually leads to the city's performance score:

$$\pi_{nt} = \pi\left(\tau_{nt_n}, q(\tau_{nt_n})\right) \tag{2}$$

An effect of turnout rates on candidates' quality q could possibly arise because, say, expected high turnout competitions attract mayoral candidates that are better (or worse)

than mayoral candidates running in expected low turnout races, or, similarly, if political parties strategically choose candidates with suitable characteristics to compete in mayoral races according to expected turnout rates (Feddersen, 2004). Alternatively, a turnout-quality nexus would emerge if, conditional on the quality distribution in the pool of mayoral candidates, better candidates were more likely to be elected in low turnout races, as in costly voting models where citizens have both private values (ideology) and commonly valued candidates' valence (Ghosal and Lockwood, 2009; Aldashev, 2015; Godefroy and Henry, 2016; Lo Prete and Revelli, 2017).

Second, the rate of turnout might have an impact on performance that does not work through the quality of candidates but through a discipline effect on elected officials (the first term in parenthesis on the right-hand side of equation (2)). As we discuss below, if incumbents perceive turnout changes to be persistent due to consuetude and habit formation (Green and Shachar, 2000; Gerber et al., 2003; Meredith, 2009; Fujiwara et al., 2016) and if voters vote retrospectively (Lewis-Beck and Paldam, 2000), maximization of re-election chances requires incumbents to respond immediately to the preferences of the new constituency.

In order to identify the channel of transmission from turnout (τ_{nt_n}) to performance (π_{nt}) we adopt the following empirical strategy. First, consider the empirical analog of equation (1), where we add unobserved time-invariant local characteristics (h_n) along with unobserved time-varying influences on performance (ε_{nt}), both of which might in principle be correlated with τ_{nt_n}:

$$\pi_{nt} = \rho\tau_{nt_n} + h_n + \varepsilon_{nt} \quad (3)$$

To estimate equation (3) consistently, we need to address two issues. First, we remove cities' time-invariant characteristics (e.g., social capital) that might be systematically correlated with turnout by differencing equation (3) between consecutive elections:

$$\Delta\pi_{nt} = \rho\Delta\tau_{nt_n} + \Delta\varepsilon_{nt} \quad (4)$$

In our empirical set-up, this is feasible because the staggered nature of the municipal election schedule and the availability of two consecutive elections for each Italian municipality over a decade allow us to control for year-specific nationwide influences on local elections, and remove time-invariant local attitudes towards voting by taking time-differences. Second, and crucial to our analysis, given that it might be the case that $E(\Delta\varepsilon_{nt}|\Delta\tau_{nt_n}) \neq 0$, we exploit exogenous circumstances, say $\boldsymbol{d}_{nt_n}$, that plausibly affect turnout rates at the t_n elections and are orthogonal to ε_{nt}, and use them as instruments for τ_{nt_n} based on $E\left(\Delta\varepsilon_{nt}\middle|\Delta\boldsymbol{d}_{nt_n}\right) = 0$.

In particular, we use two distinct sources of exogenous perturbations to turnout as instruments, one of which is anticipated while the other is unanticipated. The first one, $d(c)_{nt_n}$, is a dummy variable that equals 1 if the municipal election at time t_n in city n was held concurrently as a more salient election.[1] The existence, in the Italian institutional set-up, of a multi-tiered structure of government comprising two further levels of subnational representative assemblies (provincial and regional councils), the national level (two chambers holding contemporaneous general elections), and the European parliament,

generates an involved schedule of recurrent elections. In some years, municipal elections are held on the same day as those other elections. Importantly, the effects of those concomitant elections can be identified separately from nationwide year effects thanks to the fact that municipal as well as provincial and regional elections are staggered, in the sense of taking place in different years. Moreover, even when municipalities happen to face multiple elections in the same year, those elections do not necessarily occur on the same days. The fact that local elections will be held simultaneously as national ones is known in advance to parties, who might select candidates in the light of the expected higher degree of turnout in those circumstances relative to when local elections are held off the parliamentary electoral cycle. This is therefore an anticipated shock to turnout.

Indeed, we can expect the response of political parties and electorates in different cities to the fact that the next municipal election will be held concurrently as a high stakes parliamentary one to be heterogeneous depending on local circumstances. These include the typical rate of voter turnout in ordinary off-cycle elections reflecting the degree of social capital and civic engagement of the electorate (with cities having near-universal voter turnout being virtually unaffected by a change in the instrument), the margin of victory of the incumbent mayor in the previous election, and the alignment of the local government with the incumbent Prime Minister. As a result, this IV strategy will identify a weighted average of the performance gains or losses to the cities induced to change their choices of representatives by a change in the concomitant elections instrument.

The second instrument we use, $d(w)_{nt_n}$, arises instead from an unanticipated shock to

turnout. It is a dummy variable that equals 1 if the municipal election at time t_n in city n was held in adverse weather conditions (a rainy day). The potential effect of the weather on voter participation in elections and on the outcomes in those elections is a priori uncertain. Adverse weather affects both the cost of going to the polls, though plausibly in a far from dramatic way in likely circumstances, and the utility of performing alternative activities over what in most countries, including Italy, is an election weekend during spring through summer.[2] This might explain the diverse results emerged in the literature (Knack, 1994; Shachar and Nalebuf, 1999; Gatrell and Bierly, 2002; Gomez et al., 2007; Hansford and Gomez, 2010; Eisinga et al., 2012; Artes, 2014; Lind, 2014; Persson et al., 2014; Arnold and Freier, 2016; Dong-Hee, 2016; Fujiwara et al., 2016).[3] What matters in our context is that weather conditions represent unanticipated shocks to the rate of turnout whose effects can be compared to those originated by anticipated ones due to the presence of concomitant elections. In this case, variation in voter turnout due to weather conditions on the day of the elections must have an impact on the performance of cities that is conditional on the characteristics of the candidates that have been selected by parties to run as mayors. A possible transmission mechanism from unanticipated changes in voter turnout to city performance metrics is that weather shocks alter the number as well as the characteristics of actual voters, possibly bringing in less informed and educated ones (Hodler et al., 2015; Hoffman et al., 2017) – a sort of *de facto* enfranchisement of citizens that would otherwise be excluded.[4] Indeed, the recent and growing literature on the causes and consequences of enfranchisement poses a link between the size of the constituency of

voters that gains the franchise – be it a *de iure* (e.g., enfranchisement of women) or a *de facto* one (bringing to the polls citizens that would otherwise abstain) – and responsiveness of politicians to their demands. In particular, the evidence points to a prompt response of policy-makers to the extension of voting rights (or practice) to previously excluded groups (Lott and Kenny, 1999; Aidt et al., 2006; Miller, 2008; Bertocchi et al., 2020). In our context, if elected mayors perceive the changes in the size and possibly composition of the electorate that actually cast their votes due to temporary weather shocks as persistent,[5] they will respond immediately to the preferences of this new constituency by selecting policies that lead to different city performance outcomes than would otherwise be observed. This implies that the rate of turnout will in this case have an eventual impact on the performance of a city conditional on the inner quality of elected mayors. Admittedly, though, we cannot rule out that unanticipated shocks to turnout affect the selection of mayor candidates as well as of the members of the municipal council in terms of characteristics that we simply cannot observe. We will discuss and test a number of these possible alternative hypotheses in section **5**.

3. DATA

We use data on mayoral elections through the 2000s in the large Italian municipalities that are administrative centers of the about one-hundred provincial boroughs.[6] Once we merge data on the variables of interest – electoral outcomes and city performance scores – we end up with a sample including 186 municipal elections held in 93 municipalities over the

2001-2010 decade (see the data appendix for details). What follows gives a summary and illustration of electoral schedules, voter turnout figures, and urban performance metrics.

3.1. Election timing and voter turnout in Italy

Consider the overall schedule of Italian elections first. Between 2001 and 2010, people were called to the polls three times to vote for the national Parliament (in 2001, 2006 and 2008), twice to vote for the European Parliament (in 2004 and 2009) and twice for local elections (municipal, provincial and regional councils). We focus on turnout in the municipal elections taking place every five years according to a staggered election schedule.

The first column of table 1 reports the number of municipalities that held local elections in each of the years between 2001 and 2010. In the other columns, we show in how many instances municipal elections were held concurrently as other elections. In our sample of 186 municipal election events, European elections occurred on the same day as municipal elections in 58 instances, national elections in 26, regional elections in 15, and provincial elections in 62. In most cases, higher level elections followed the same 5-year cycle as municipal elections.

As regards electoral participation, voter turnout in municipal elections over the 2001-2010 decade equaled 76.8% on average, ranging from a minimum of 61.75% to a maximum of 89.43% (descriptive statistics are in table A1 of the data appendix). Table 2 shows the average level of voter turnout in municipal elections in each year. It is interesting to notice that turnout was higher in 2001 and 2008, that is, in the two years when national elections

were scheduled on the same day as municipal elections. In 2006, when national elections were scheduled in the same year but with a one-month lag, electoral participation was considerably lower, and comparable to the years 2003 and 2010. In these two years, people voted for municipal elections only or, in a few cases, for concomitant provincial elections, that tend to be perceived as less salient than municipal ones though.

To get a sense of the role of election concomitance, table 3 reports OLS estimates of a first-differenced turnout determination equation in municipal elections that includes dummy variables for concomitant upper-tier elections. The results show that the strongest determinant of voter turnout in local elections is the presence of national elections on the same day, which significantly enhances voting for municipal offices by almost nine percentage points. Instead, concomitant European, regional and provincial elections are not significantly associated with municipal voter turnout, and column (2) shows that holding national elections on the same year as municipal ones but not on the same day, as in 2006, is not relevant to voter turnout. In table 3, we also include other potentially relevant sources of heterogeneity across Italian municipalities. In column (3), the concentration index of the population living in the main cities is negatively associated with electoral participation. The effects of indicators of the demographic structure, such as the dependency ratio (i.e., the ratio of people not in the working age to the labor force), and the unemployment rate are not precisely estimated. In column (4), we consider the percentage of people aged 6 or older who read a newspaper at least once a week, as a proxy of civic engagement and education (for which we have no yearly data at the local level). In column (5), we control

for the (log of the) number of registered voters in the municipality and for the dummy variable "second term," that takes value 1 if the incumbent mayor wins the elections for the second time in a row (in our sample this is the case in 61 elections). These variables are not significantly associated with voter turnout. In the IV regressions to follow, we will use the concurrence of national elections as anticipated shocks to voter turnout, and we will control for the role of the set of control variables that appear in column (5) of table 3.

3.2. Measuring the performance of cities

First, we use an index of urban environmental performance delivered yearly by *Legambiente*, an independent Italian nonprofit organization, to proxy the quality of environmental policy-making. The index is computed using a large number of variables including green space availability, air quality in terms of concentration of pollutant emissions and its consequences on human health, drinking water quality, public transportation systems, energy consumption and separate waste recycling performance. The score ranges from 0 to 100, and can be interpreted as the degree to which a city performance approaches a feasible optimal performance. Clearly, urban environmental quality is not entirely under control of municipal governments also due to possible spillovers from nearby jurisdictions. However, given their institutional role in environmental monitoring, regulation and protection, the impact of city governments on environmental performance can be substantial. Moreover, the annually released city *Legambiente* ranking attracts considerable media attention, fostering awareness among citizens about the quality of their urban environment and implicitly constituting an

assessment of the performance of local policy-makers in adequately managing their environmental protection tasks (Bianchini and Revelli, 2013). We will also use a sub-category of the *Legambiente* index, the narrower measure that refers to the specific service of separate waste collection, which some argue to be more directly under the control of mayors relative to other dimensions of urban performance such as, for instance, air quality (Bordignon et al., 2014).

Next, we consider a more comprehensive indicator that provides information on the overall quality of life in Italian provinces. It is compiled by *Il Sole 24 Ore*, the most important newspaper on economic topics in Italy. The indicator encompasses six major dimensions: business, labor and innovation; income, savings and consumption; environment, services and welfare (the *Legambiente* index is among the variables used to build this dimension of urban life quality); demographics, family and integration; justice, order and crime; culture and civic engagement. The *Il Sole 24 Ore* index refers to the quality of life in the province, that is, in the larger borough of which the cities we are considering are administrative centers, and ranges in our sample between the 344 points recorded in Benevento in 2001 and the 641 points of Trieste in 2006.

Figure 1 illustrates the pattern of city performance scores and turnout rates for the 93 cities for which we have complete data on two election waves, the first one taking place (due to an exogenously staggered election schedule) between 2001 and 2005, and the second one taking place five years later, from 2006 to 2010. For each city, we consider the city performance score released at the mid of the term of office. This choice has the advantage

of reducing concerns related both to break-ups of the local government before the natural end of the term of office and to electoral cycles effects whereby local administrators may set policy agendas to please citizens as the next election round approaches. In the next section, we will also show the results we obtain when we consider the average city performance scores over the term of office of the elected mayor, running regressions on the smaller sample of municipalities whose administrations did not break up over the period considered.

<<Place Fig. 1 about here>>

Figure 1 draws the difference in performance scores between the two measurement waves against the corresponding difference in voter turnout between the elections for each city, thus differencing away any fixed city characteristic (as in equation (4)). Voter turnout is plotted against the *Legambiente* index in the upper panel, the separate waste collection score in the middle panel, and the *Il Sole 24 Ore* index in the panel at the bottom. The panels in Figure 1 show that there is substantial variation in performance outcomes across municipalities and, in particular, across the main cities in the sample, for whom we report labels. As regards electoral participation, voter turnout has decreased by three percentage points on average across the two election waves (2001-05 versus 2006-10), recording a maximum decrease of 21 percentage points in Rimini and a maximum increase by 11.5 percentage points in Pordenone.

In all panels, the correlation between city performance and voter turnout is negative. The results from a simple OLS regression on the differenced data indicate that higher turnout

is significantly correlated with worse city performance scores. An increase in electoral participation by 10 percentage points is accompanied by a 4 percentage points lower environmental performance score (p=0.002), a 3.7 lower waste collection percentage (p=0.100) and a 29.4 lower score of quality of life in the city (p=0.002). Of course, this evidence is only suggestive of a genuinely causal effect of voter turnout on urban performance, an issue that we explore in the empirical analysis to follow.

4. VOTER TURNOUT AND CITY PERFORMANCE

We estimate equation (4) by instrumental variables, and check the robustness of the results with a number of alternative specifications. First, table 4 reports estimates of equation (4) for our three measures of city performance using the dummy variable for concurrence of national elections as an instrument for voter turnout.

The upper panel of Figure 2 displays the performance of the concurrent election dummy used as instrument by plotting its variation between the two election waves (+1 when the instrument switches from non-concomitant to concomitant elections, -1 for an opposite switch, and 0 for no variation in the instrument between consecutive elections) against the corresponding changes in municipal voter turnout after removing the wave effect. The concurrent election dummy switches either way from one election to the next in about one of four municipalities, moving turnout in the direction suggested by the estimation results in table 3 (a boost to turnout from holding elections concurrently) in over 80% of those instances. A similar picture is shown in the lower panel of Figure 2, where the cumulative

distribution functions of voter turnout variations between the two elections drawn by instrument change values (-1, 0, +1) do not overlap, suggesting that the instrument performs well across all ranges of the endogenous turnout variable.

<<Place Fig. 2 about here>>

In all specifications of table 4, the effect of voter turnout on city performance metrics is negative and significant. A ten per cent increase in voter turnout is estimated to cause a six per cent fall in the environmental quality score and in the percentage of waste recycling and almost a seventy points drop in the quality of life index. In all columns, the value of the Kleinberger-Paap test for weak identification does not point to a problem of weak instruments.[7] The reduced form results reported in the lower panel of table 4 show negative and significant coefficient estimates too on the instrument for all indicators of performance. To test the robustness of these results, the first column of table 5 excludes the Italian municipalities with a population larger than 200,000 inhabitants. These are the most important cities, where local elections receive the highest attention from the media, and might be qualitatively different than the rest of the cities in the sample. Our results do not appear to be driven by those larger municipalities, though: the rate of voter turnout is estimated to have a negative impact on environmental quality, waste recycling and quality of life in the smaller sample of 80 municipalities with a population smaller than 200.000 inhabitants. Our results also hold in column (2) of table 5, where we exclude, as potential outliers, the municipalities of the autonomous regions of Sardegna, Friuli-Venezia Giulia

and Sicilia that are constitutionally entitled with broader autonomy (home rule).

In Italy, on average, the *Legambiente* index and the *Il Sole 24 Ore* index record higher values in the municipalities located in the North of the country. To test if there is heterogeneity between the North and the rest of the country, in the last two columns of table 5 we split the sample to consider only the municipalities belonging to the regions in the North of Italy (column (3)) and to the regions in the Center and in the South (column (4)).[8] The results turn out to be qualitatively similar in the two sub-samples.

In table 6, we test whether the rate of turnout has an impact on a number of alternative measures of government performance that can be interpreted as indicators of efficiency of municipal bureaucracies (Gagliarducci and Nannicini, 2013; Casaburi and Troiano, 2016). In the first column, we estimate the effect of voter turnout on the speed of revenues collection, computed as the ratio between current collected revenues and total revenues due to the municipality. In the second column, we consider the speed of public good provision, that is the ratio between current paid outlays and total outlays commitments reported in the municipal budget. In both columns, the effect of voter turnout is estimated to be negative and statistically significant, suggesting that the negative impact of turnout is not specific to urban environmental quality and quality of life proxies. As a last robustness check, in columns (3) to (6) of table 6 we average city performance scores over the term of office of the elected mayor, excluding election years (over which the former and the incumbent administration would overlap due to differences between the calendar and electoral year). This implies considering the city performance averaged over four years, and the smaller

sample of municipalities whose administrations did not break up over that term. Despite the loss of information, our results of a negative effect of electoral participation on urban environmental and life quality hold also in this case.[9]

Finally, table 7 presents the estimation results of equation (4) when using the weather related instrument. In column (1) of table 7 we report the estimates from a first-differenced OLS regression of voter turnout on a dichotomous variable taking value 1 if the election day was wet, zero otherwise, its interaction with geographical controls (coastal regions), and the set of control variables we use in our empirical models.[10] The estimates indicate that electoral participation is significantly higher – over six percentage points – in rainy election days, a result in line with Knack's (1994) finding of a positive association of cold election day temperatures and voter turnout. This evidence suggests that adverse weather conditions favor turnout in Italian municipal elections, probably due to the loss of alternatives that a sunny day in late Spring offers. This association holds all over the country, and is not estimated to be stronger in areas far from the sea, where people may value a sunny day off more because it takes longer to reach a warm seaside vacation area. In our sample, it was raining in 50 cases on the day of municipal elections, but only on 28 occasions the instrument recorded a change from one election to the next. The upper panel of Figure 3 shows that the weather dummy moves turnout in the direction suggested by the empirical results in the first column of table 7 – higher (lower) turnout in rainy (dry) days – in about two-thirds of those observations. The lower panel of Figure 3 depicts the cumulative distribution functions of voter turnout variations between the two election

waves, drawn by instrument change values. The distribution functions are distinctively apart for most sample observations, and slightly overlap in the proximity of null voter turnout changes between the two elections, suggesting that the performance of the weather-related instrument is acceptable, though not as good as that of the concomitant elections one. As for the estimation results in table 7, the evidence reported in columns (2) to (6) generally confirms the negative effect of voter turnout on city performance outcomes, with the sole exception of the waste recycling score.

<<Place Fig. 3 about here>>

5. VOTER TURNOUT AND QUALITY OF MAYORS

As argued in section **2**, the effect of turnout on urban environmental performance, quality of life, and administrative efficiency might be mediated by the 'quality' or 'valence' of the elected mayors. Therefore, to shed light on the transmission mechanism between electoral participation and city performance, we estimate the effect of voter turnout on a number of mayors' characteristics.

In principle, the ability of mayors to affect the performance of a city might refer both to their competence – that is, knowledge of the processes by which the performance of a city is produced - and to their probity in terms of honest, impartial, and uncorrupt behavior (Besley, 2005). However, the available information on elected mayors in Italy allows us to build proxies of competence only. In particular, official data from the Italian Ministry of

Interior document individual characteristics of the elected mayors with regard to professional status and education. As for occupational status before the election, we assume that the level of competence needed to define and implement strategies in the policy, institutional, and economic fields is the one that can be acquired by people working at high levels of government bodies, public administrations, the judicial system, the education system, international organizations, and public and private companies. We therefore build a dichotomous variable ('professional mayor') that equals 1 if the mayor was employed by one of those organizations in a high-skilled white-collar job (including managers, lawyers, professors, journalists, entrepreneurs), zero otherwise. As for education, we know for all mayors whether they hold a primary, secondary or undergraduate degree, but we have no information about the kind of program they attended nor on any graduate or post-graduate degree they might have earned. We therefore build a dichotomous education variable taking value 1 if the mayor has a bachelor degree and zero otherwise.

The results in table 8 are based on linear probability models.[11] The first column using the 'professional mayor' dummy as dependent variable and the concurrent elections dummy as an instrument indicates that turnout has a negative impact on the probability of electing high professional status mayors, thus suggesting that high participation due to low costs of voting tends to reward less competent candidates. Since the shock to participation is anticipated, this is compatible with the idea that parties select lower quality candidates in elections that are expected to have high turnout. If higher turnout implies a larger proportion of voters with lower degrees of information, competence, and literacy, it is

rational for parties to pick lower quality candidates that yet might be more appealing to voters on other unobserved dimensions (celebrity, populist attitude, looks). This finding holds in the second column of the table, where we consider a more restrictive definition of profession-related valence that does not include entrepreneurs, and in the third column, where we consider the chances of electing a mayor who holds a bachelor degree. Columns (4) and (5) report the estimation results with mayors' age and gender as dependent variables, showing a negative effect of turnout rates on mayor's age, and a positive although not significant effect on the probability of electing a male mayor. In the last column of table 8, we focus on a measure of electoral competition: the number of candidates running for the office of mayor. This is the only information we have on the pool of candidates and may allow us to get some insight into the effect of exogenous shocks to voter turnout on the selection of candidates. In our sample, the number of candidates ranges from a minimum of 2 (in Lecce, Matera, Teramo, and Verbania) to a maximum of 16 candidates (in Rome's municipal elections in 2001). Interestingly, this number increases in voter turnout when we use concomitant national elections as an instrument, suggesting that expectations of higher voter participation due to concurrence with higher stakes races tend to attract more candidates to mayoral competitions.

In table 9, we use the unanticipated shock due to weather conditions on election day as an instrument for voter turnout in the quality of mayors' equation. Interestingly, there is no effect of the rate of turnout on any of the indicators of quality of the mayors in this case. This suggests that the unanticipated shock to turnout determined by weather conditions on

the day of the elections has an impact on the performance of cities (as documented by the results in table 7) that does not operate through the observed indicators of quality of the elected mayors that we can observe. While this result is compatible with the hypothesis that elected mayors perceive the changes in the composition of actual voters due to temporary weather shocks as permanent and respond immediately to the preferences of this different constituency by selecting policies that lead to different city performance outcomes than would otherwise be observed, we cannot exclude a number of alternative mechanisms. First, the variation in turnout rates might have consequences on the composition of the municipal council. In Italy, a majority premium ensures that the party list (or lists) supporting the most voted mayor candidate will get at least 60% of the seats in the council, with the seats being assigned to councilor candidates based on their individual preference votes.[12] Being a parliamentary democracy, and with an average size of around forty councilors, the municipal decision-making process is bound to be heavily influenced by the actual composition of the elected council.[13] To test this hypothesis, in the first columns of table 10 we report the results of estimation of the impact of the rate of turnout, instrumented by weather conditions on the day of the elections, on a number of measures of structure and dispersion of seats within the council. When we consider party concentration, measured by the Herfindahl index which ranges between 0 (dispersed) and 1 (concentrated), there is no effect of voter turnout at the level of the overall council (column (1)) or of the majority coalition (column (2)), and only a mild effect on the concentration of party seats within the opposition (p=0.15, column (3)). In column (4), we

test if variation in turnout rates has an impact on the strength of the elected government, proxied by the 'margin of majority', the fraction of seats held by the coalition supporting the elected mayor. The results are again not statistically significant.[14]

Relatedly, weather conditions might bring to the polls people who have different ideological views than regular voters and, hence, vote for members of the council that are less sensitive to certain urban quality outcomes. In particular, a negative effect of larger turnout on city performance as measured by environmental quality scores could be rationalized within a theoretical model where voters self-select based on ideological traits, with voters caring less intensely about urban quality of life voting in relatively larger proportions when the cost of voting is low. Previous literature suggests that exogenous variation in the cost of voting, as due for instance to weather shocks, might indeed affect political parties differently (Gomez et al., 2007; Artes, 2014; Lind, 2014; Arnold and Freier, 2016). To assess empirically if this mechanism is at work, we test the effect of weather shock to the cost of voting on the electoral performance of right-wing and left-wing parties, coding as left-wing an elected mayor that was supported by a coalition that includes at least one left-wing party. The results in column (5) of table 10 do not support the hypothesis that the chances of electing a mayor from a left-wing coalition are affected by the rate of voter turnout. Finally, in column (6), we employ the vote share of the main left-wing party, the Democratic Party, as the dependent variable, yet find no evidence of a causal effect of voter turnout on the largest left-wing party share.

Indeed, the above results are compatible with the hypothesis that shocks to the cost of

voting that alter the rate of turnout in an unanticipated way have an eventual impact on the performance of a city through changes in the incentives, and consequently on the behavior, of elected officials. Admittedly, though, we cannot rule out that those shocks influence the selection of mayor candidates as well as of members of the municipal council in terms of characteristics that we simply cannot observe (such as motivation or probity) and that have a significant effect on the success of cities.

6. CONCLUDING REMARKS

This paper has investigated whether exogenous variation in voter turnout in local elections has an impact on the subsequent performance of cities, making the novel attempt at discriminating between the consequences of anticipated versus unanticipated shocks to the cost of voting. We have employed a panel dataset of municipal elections in the main Italian cities during the 2000s recording information on voter turnout, electoral results, mayors' characteristics, and a number of outcomes of urban policy in terms of administrative efficiency, environmental performance, and indicators of overall quality of city life. As for the anticipated source of variation in voter turnout, we have used the concomitance of local and national elections – a circumstance that has been proved to have a significant impact on turnout by an increasing empirical literature. Importantly, we can fully exploit here the variability of concomitant elections across jurisdictions and separately identify it from nation-wide common shocks to voter turnout thanks to the fact that Italian municipal elections take place according to a staggered schedule. On the other hand, as an

unanticipated shock to the cost of voting we have exploited the availability of information on weather conditions on the day of mayoral elections, coded them as a dichotomous rainy/dry day dummy, and used that dummy variable along with its interaction with a geographical location indicator as instruments for potentially endogenous turnout rates. The availability of these two distinct sources of exogenous variation in the rate of turnout along with information on mayors' quality proxies (professional status and education) have allowed us to shed some light on the channel through which perturbations to turnout rates translate into the performance of cities.

First, the evidence consistently points to a negative and significant impact of voter turnout rates on city performance scores, irrespective of the instrument we use for the endogenous turnout rate.

Interestingly, we find that municipal races experiencing large rates of turnout due to concurrence with higher stakes elections tend to favor the success of mayors that are less educated and have lower professional status. On the other hand, turnout changes due to unanticipated (weather) shocks to the cost of voting are estimated to have a significant impact on the performance of Italian cities while having no effect on the indicators of quality of the elected mayors. As we discuss in the paper, the overall evidence is compatible with the hypothesis that anticipated shocks to voter turnout affect the eventual performance of a city through a selection mechanism of political parties choosing mayoral candidates to maximize their chances of winning the elections based on their expectations of the size and composition of the electorate actually casting their votes.

DATA APPENDIX

The cities in the sample are the main municipalities (and administrative centers) of the province they belong to. The number of Italian provinces has changed over time because of administrative mergers. Between 2001 and 2010, 102 provinces were operational and kept the same administrative center. Information on electoral outcomes is available for 93 municipalities, because data on autonomous regions are not complete or not comparable. Specifically, the online archive of the Ministry of Internal Affairs provides complete data for Friuli-Venezia Giulia and Sardegna but not for Sicilia (for which it includes 3 (out of 9) municipalities). And we cannot include the three municipalities of the two bi-linguistic regions of Valle d'Aosta and Trentino-Alto Adige because their election mechanisms are different to the one adopted in the other Italian regions. Data refer to first-round election outcomes between 2001 and 2010. If we observe more than one observation in a cross-section, due to an early break-up of the local government, we keep the less recent one.

Data on city performance are from the *Legambiente*'s yearly report "Ecosistema Urbano" and from the newspaper *Il Sole 24 Ore*. The *Legambiente* index is published at the end of each year and gathers information on city performance in the previous year (sometimes also two years). This means that the *Legambiente* score released, for instance, in 2011 includes information on the city performance in 2010 (and 2009). Instead, *Il Sole 24 Ore* index released at the end of each year gathers information on the previous year as well as on the current year (and sometimes two years before). To measure the performance of a local government avoiding overlaps with the former and the next administration, we use the *Legambiente* score and *Il Sole 24 Ore* index released between two and four years after the election, and use the one released at the mid of the term of office (i.e. three years after the election) in the main regressions.

Socio-economic variables are from the Italian Statistical Institute (ISTAT). The concentration

index of the population living in big cities, the dependency ratio, the unemployment rate, the percentage of people aged 6 or older who read a newspaper at least once a week are measured at the regional level. Our main results would not change if we used the concentration index and the dependency ratio at the provincial level. Data on voter turnout, registered voters, local governments' budgets and on the characteristics of the elected mayors are from the Ministry of Internal Affairs. Data on weather conditions are from the online Italian Weather Archive and the regional agencies for environmental protection (ARPAs). In the paper, we do not use rainfall in millimeters because national sources provide validated data while regional weather indicators are not (thus any data-merge would suffer from measurement errors).

FOOTNOTES

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1. The political science literature has long recognized that concomitant elections can have an influence on voter turnout. Grouping expectedly less salient to more salient elections has been proposed as a potential remedy to low levels of voter turnout (Lijphart, 1997; Hajnal and Trounstine, 2005), and the impact of election cycles on voters' behavior and political outcomes has been studied in a series of recent works (Berry and Gersen, 2011; Garmann, 2016; Bracco and Revelli, 2018; Cantoni and Gazzé, 2019).

2. On the eve of a controversial popular initiative referendum in June 1991, Italy's Prime Minister Bettino Craxi provocatively encouraged voters to head to the beaches instead of the polls.

3. Weather conditions provide strong and credible instruments in other empirical applications too, as in the identification of demand functions in markets where they have

an important impact on supply (Angrist et al., 2000).

4. In Fujiwara (2015) the enfranchisement of less educated voters is the result of the introduction of electronic voting technologies making the act of voting easier in Brazilian elections, and is estimated to affect policy in a manner consistent with political economy theories of redistribution.

5. Fujiwara et al. (2016) use rainfall on election day to identify habit formation in voting thanks to the fact that it is a transitory and unexpected shock, thus affecting current but not future voting costs. Their analysis of daily weather and county-level US presidential elections data through more than half a century provides evidence that both contemporaneous and lagged election day rainfall influence voter turnout, with current turnout changes due to weather shocks affecting turnout in subsequent elections on an almost one-for-one basis.

6. Focusing on those largest cities makes it possible to use information on indicators of policy outcomes that are key to our analysis and are only available at the chief provincial city level, most importantly the indicators of urban environmental performance and life quality.

7. To foster confidence in the strength of the instruments, the Kleibergen-Paap Wald rk F statistic should be comparable to the critical values (in the order of 10) computed by Stock and Yogo (2005) for the Cragg-Donald statistic it generalizes when the assumption of i.i.d. standard errors is dropped, as in the case of robust standard errors (see Baum et al., 2007).

8. There are not enough municipalities to show the result for the islands (i.e., Sardegna and Sicilia) sub-sample.

9. We obtain similar findings in sign and magnitude when we consider the sample of 61 municipalities whose administrations lasted until the natural term of office both in the 2001-05 and in the 2006-10 election wave.

10. One may argue that the intensity of rainfall has different effects in different areas of a country. Lind (2015) shows that the correlation between rainfall and turnout may be spurious if turnout follows a spatio-temporal trend which is related to any spatial dependence in rainfall data. To control for this possibility, we include an interaction term between rain and being a coastal region. Similar, albeit weaker in terms of instruments' power, results can be obtained using a time trend and other latitude or altitude dummies (coastal cities, north-south, plane-mountain).

11. Despite the arguments against the use of linear probability models with binary dependent variables, there is consensus in the literature about considering them preferable to non-linear models when working with panel data and instrumental variables. In those cases, logit and probit's outcomes should be indeed converted into marginal effects that would become difficult to deal with both for computational and interpretational reasons (for a discussion see Angrist and Pischke, 2009).

12. There are a few exceptions (six in our dataset) of municipalities where, due to close first-round election outcomes, the party coalition supporting the elected candidate has less than 60% of the seats in the council. The results in tables 10 hold when we run regressions

on the smaller sample of municipalities which does not include such observations (results not reported).

13. In a related strand of the literature, changes in political institutions as the introduction of elective chambers of representatives have proven to improve executive leaders' incentives and overall governance (Lindberg, 2013; Grossman, 2014; Han and Demircioglu, 2016). We cannot exploit any such reform here due to Italy's long tradition of elective democratic institutions.

14. We have built a number of other measures of concentration of seats and share of votes of the main leading and minority parties. However, none of these variables was estimated to be influenced by variations in voter turnout.

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FIGURES CAPTION (TITLES)

Table A1. Descriptive statistics

Variable	Number	mean	std. dev.	min	Max
Voter turnout	186	76.80	5.21	61.75	89.43
Environmental quality	186	50.29	8.80	17.74	73.71
Waste recycling	186	29.73	16.67	1.00	72.10
Life quality	186	491.17	53.17	344.30	641.00
Concentration	186	45.01	24.34	22.67	121.40
Dependecy ratio	186	51.41	3.46	42.50	61.60
Unemployment rate	186	7.39	4.07	2.54	20.08
Read newspapers	186	58.79	9.23	40.60	73.10
Registered voters (log)	186	6.72	0.85	5.21	10.06
Second term	186	0.33	0.47	0	1
Speed of revenue collection	186	73.10	17.00	14.10	96.45
Speed of public goods provision	186	72.13	7.35	45.75	85.89
Professional mayor	186	0.53	0.50	0	1
Professional mayor (no entrepreneurs)	186	0.46	0.50	0	1
Education (BA)	186	0.79	0.41	0	1
Age	186	51.62	8.37	30	74
Gender (male)	186	0.93	0.26	0	1
Number of candidates	186	6.53	2.52	2	16
Herfindahl Index Council	186	0.20	0.07	0.07	0.43
Herfindahl Index Winning coalition	186	0.40	0.17	0.16	1
Herfindahl Index Opposition parties	186	0.36	0.12	0.13	0.88
Margin of Majority	186	0.62	0.05	0.38	0.85
Vote share of Left-wing coalition	186	0.58	0.49	0.00	1.00
Vote share of Democratic Party	185	21.41	9.89	4.25	49.92

Table 1. Municipal and higher-level concomitant elections

Year	Municipal elections	European Elections	National elections	Regional elections	Provincial elections
2001	20	0	18	0	2
2002	24	0	0	0	4
2003	9	0	0	0	1
2004	29	29	0	0	23
2005	11	0	0	8	2
2006	21	0	0	0	1
2007	22	0	0	0	3
2008	11	0	8	0	4
2009	29	29	0	0	20
2010	10	0	0	7	2

Table 2. Election data

Elections		Turnout			
Year	number	mean	st.dev.	min	max
2001	20	81.17	6.83	64.18	89.43
2002	24	77.11	5.14	67.25	84.51
2003	9	74.46	4.06	69.11	79.27
2004	29	78.75	2.82	72.85	84.21
2005	11	77.07	2.26	72.04	80.97
2006	21	74.11	6.02	64.74	85.16
2007	22	74.67	6.32	61.75	83.96
2008	11	79.18	4.63	70.64	85.86
2009	29	76.04	2.83	69.83	82.21
2010	10	73.38	3.72	67.98	80.25

Table 3. Voter turnout and concomitant elections

Dependent variable: Voter turnout in municipal elections					
	(1)	(2)	(3)	(4)	(5)
National elections (concomitant)	8.703***	8.487***	8.501***	8.635***	8.724***
	(1.165)	(1.515)	(1.081)	(1.035)	(1.060)
European elections (concomitant)	0.925				
	(1.616)				
Regional elections (concomitant)	0.822				
	(1.055)				
Provincial elections (concomitant)	-2.558				
	(1.566)				
National elections (same year)		0.244			
		(1.265)			
Concentration			-0.097*	-0.104*	-0.107
			(0.058)	(0.062)	(0.068)
Dependency ratio			-0.150	-0.076	-0.063
			(0.298)	(0.263)	(0.267)
Unemployment rate			-0.057	-0.059	-0.066
			(0.198)	(0.199)	(0.196)
Read newspapers				0.251	0.280
				(0.242)	(0.245)
Registered voters					0.437
					(1.281)
Second term					0.783
					(0.531)
R-squared	0.547	0.529	0.535	0.544	0.555
Municipalities	93	93	93	93	93

Notes: First-differenced OLS estimation. Robust standard errors in parenthesis, (*) (**) (***) denote significance at the (10) (5) (1) percent level. All models include a constant, not reported.

Table 4. Environmental performance and quality of life

Dependent variable:	Environmental quality		Waste recycling		Life quality	
	(1)	(2)	(3)	(4)	(5)	(6)
Voter turnout	-0.634***	-0.568***	-0.640**	-0.524*	-6.961***	-6.475***
	(0.180)	(0.188)	(0.294)	(0.295)	(1.291)	(1.134)
Concentration		0.589**		0.630		0.661
		(0.267)		(0.645)		(1.322)
Dependency ratio		0.683		0.201		2.287
		(0.646)		(0.964)		(2.795)
Unemployment rate		-0.262		0.789		2.422
		(0.463)		(0.763)		(1.775)
Read newspapers		0.043		0.158		4.591*
		(0.487)		(0.599)		(2.347)
Registered voters		-2.325		2.635		25.891
		(8.659)		(15.305)		(18.008)
Second term		0.663		2.255		5.690
		(0.932)		(1.424)		(5.588)
Weak identification test	62.98	67.71	62.98	67.71	62.98	67.71
Municipalities	93	93	93	93	93	93
			Reduced form			
Concomitant national elections	-5.454***	-4.955***	-5.507**	-4.574*	-59.909***	-56.481***
	(1.536)	(1.610)	(2.614)	(2.733)	(7.071)	(6.566)

Notes: 2SLS estimation. Robust standard errors in parenthesis, (*) (**) (***) denote significance at the (10) (5) (1) percent level. The dummy variable for concurrence of national elections is used as instrument for voter turnout. The models are just identified. The weak identification test refers to the Kleibergen–Paap Wald rk F statistic, robust to non-i.i.d. errors.

Table 5. Turnout impact on performance: sub-samples

Sample:	No big cities	Ordinary regions	Regions in the North	Regions in the Center-South
Column	(1)	(2)	(3)	(4)
Dependent variable:				
Environmental quality	-0.653***	-0. 612***	-0.584***	-0.970**
	(0.203)	(0.150)	(0.122)	(0.488)
Waste recycling	-0.694***	-0.643***	-0.525***	-0.783
	(0.322)	(0.262)	(0.204)	(0.699)
Life quality	-6.791**	-6.815***	-4.786***	-13.246***
	(1.233)	(1.173)	(0.614)	(4.784)
Municipalities	80	82	42	44

Notes: 2SLS estimation. Robust standard errors in parenthesis, (*) (**) (***) denote significance at the (10) (5) (1) percent level. All models include the control variables in column (5) of table 3 and a constant, not reported. The dummy variable for concurrence of national elections is used as instrument for voter turnout. The models are just identified. The weak identification test refers to the Kleibergen–Paap Wald rk F statistic, robust to non-i.i.d. errors.

Table 6. Robustness checks

Dependent variable:	Speed of revenue collection	Speed of public good provision	Environmental quality (averaged)	Waste recycling (averaged)	Life quality (averaged)
Column	(1)	(2)	(3)	(4)	(5)
Voter turnout	-2.143***	-0.235*	-0.345**	-0.511**	-1.781***
	(0.470)	(0.134)	(0.156)	(0.252)	(0.512)
Concentration	-0.295	-0.113	0.635***	0.613	0.955
	(0.298)	(0.117)	(0.197)	(0.463)	(0.848)
Dependency ratio	3.962***	0.300	0.769*	0.332	5.628***
	(1.301)	(0.389)	(0.493)	(0.833)	(1.397)
Unemployment rate	-2.643**	0.890*	0.180	0.941	-3.863**
	(1.174)	(0.517)	(0.438)	(0.803)	(1.506)
Read newspapers	3.482***	0.097	0.219	-0.145	2.329**
	(1.175)	(0.309)	(0.406)	(0.603)	(1.066)
Registered voters	10.342	-8.549***	-0.046	-0.018	14.972
	(12.949)	(3.177)	(6.157)	(13.409)	(12.276)
Second term	0.432	-1.084	0.278	1.416	3.888
	(2.890)	(0.901)	(0.803)	(1.289)	(3.139)
Weak identification test	67.71	67.71	70.51	69.91	70.51
Municipalities	93	93	80	79	80

Notes: 2SLS estimation. Robust standard errors in parenthesis, (*) (**) (***) denote significance at the (10) (5) (1) percent level. The dummy variable for concurrence of national elections is used as instrument for voter turnout. The models are just identified. The weak identification test refers to the Kleibergen–Paap Wald rk F statistic, robust to non-i.i.d. errors.

Table 7. Turnout and city performance: instrument $d(W)_{nt_n}$ (weather conditions)

Dependent variable:	Voter turnout	Environmental quality	Waste recycling	Life quality	Speed of revenue collection	Speed of public good provision
Column	(1)	(2)	(3)	(4)	(5)	(6)
Voter turnout		-0.904**	0.343	-7.042***	-2.951*	-0.785*
		(0.452)	(0.634)	(2.042)	(1.644)	(0.436)
Concentration	-0.273*	0.351	0.709	1.135	-0.599	-0.286
	(0.154)	(0.457)	(0.872)	(1.893)	(0.532)	(0.214)
Dependency ratio	-0.545	0.697	0.186	1.463	3.201**	0.003
	(0.390)	(0.695)	(1.096)	(2.823)	(1.425)	(0.460)
Unemployment rate	-0.426*	-0.465	0.968	2.688	-2.853**	0.769
	(0.230)	(0.457)	(0.694)	(1.843)	(1.392)	(0.513)
Read newspapers	-0.044	-0.005	0.154	4.900**	3.610***	0.144
	(0.281)	(0.495)	(0.646)	(2.390)	(1.287)	(0.375)
Registered voters	-2.552	-5.913	2.802	36.633	8.734	-9.465*
	(5.146)	(8.807)	(19.178)	(23.863)	(16.349)	(5.482)
Second term	0.527	0.660	2.336	7.036	1.858	-0.509
	(0.813)	(1.043)	(1.589)	(6.582)	(3.292)	(1.125)
Rain	6.367**					
	(2.605)					
Rain*coastal region	-3.325					
	(2.649)					
Over-id. Restrictions		0.079	0.611	0.444	0.354	0.312
		[0.778]	[0.434]	[0.505]	[0.552]	[0.577]
Weak identification test		4.39	4.39	4.39	4.39	4.39
Municipalities	90	90	90	90	90	90
			Reduced form			
Rain		-6.322	-0.456	-38.784***	-24.229*	-6.317***
		(4.175)	(3.586)	(10.194)	(14.217)	(1.952)
Rain*coastal region		3.853	2.809	14.361	17.951	4.580*
		(4.360)	(4.199)	(10.094)	(14.624)	(2.316)

Notes: 2SLS estimation. Robust standard errors in parenthesis, (*) (**) (***) denote significance at the (10) (5) (1) percent level. All models include a constant, not reported. The dummy variable rain and its interaction with coastal region are used as instrument for voter turnout. Over-identifying restrictions tests the null that all the instrumental variables are orthogonal to the second-stage error term. The weak identification test refers to the Kleibergen–Paap Wald rk F statistic, robust to non-i.i.d. errors.

Table 8. Quality of elected mayors: instrument $d(c)_{nt_n}$ (concomitant elections)

Dependent variable:	Professional mayor	Professional mayor (no entreprs)	Education (BA)	Age	Gender (male)	Number of candidates
Column	(1)	(2)	(3)	(4)	(5)	(6)
Voter turnout	-0.022**	-0.026**	-0.009*	-0.351*	0.012	0.144***
	(0.011)	(0.012)	(0.006)	(0.179)	(0.008)	(0.051)
Concentration	-0.018	-0.017	-0.006	-0.531**	-0.012	0.084**
	(0.017)	(0.017)	(0.007)	(0.253)	(0.014)	(0.042)
Dependency ratio	-0.005	-0.008	0.023	-0.241	-0.015	-0.058
	(0.040)	(0.043)	(0.024)	(0.470)	(0.019)	(0.139)
Unemployment rate	0.016	0.016	0.023	-0.404	0.009	0.191
	(0.034)	(0.036)	(0.028)	(0.567)	(0.026)	(0.152)
Read newspapers	-0.028	-0.013	0.003	0.435	-0.001	-0.010
	(0.029)	(0.033)	(0.015)	(0.512)	(0.014)	(0.108)
Registered voters	-0.643	-0.556	-0.365	-0.368	-0.119	3.258***
	(0.408)	(0.382)	(0.337)	(8.806)	(0.193)	(0.692)
Second term	-0.076	-0.052	-0.038	4.065***	-0.001	-0.172
	(0.063)	(0.061)	(0.035)	(1.057)	(0.035)	(0.251)
Weak identification test	67.71	67.71	67.71	67.71	67.71	67.71
Municipalities	93	93	93	93	93	93
			Reduced form			
Concomitant national elections	-0.195**	-0.230**	-0.079	-3.060*	0.104	1.254***
	(0.095)	(0.100)	(0.049)	(1.616)	(0.068)	(0.414)

Notes: 2SLS estimation. Robust standard errors in parenthesis, (*) (**) (***) denote significance at the (10) (5) (1) percent level. All models include a constant, not reported. The dummy variable for concurrence of national elections is used as instrument for voter turnout. The models are just identified. The weak identification test refers to the Kleibergen–Paap Wald rk F statistic, robust to non-i.i.d. errors.

Table 9. Quality of elected mayors: instrument $d(w)_{nt_n}$ (weather conditions)

Dependent variable:	Professional mayor	Professional mayor (no entreprs)	Education (BA)	Age	Gender (male)	Number of candidates
Column	(1)	(2)	(3)	(4)	(5)	(6)
Voter turnout	-0.011	-0.029	-0.011	-0.740	-0.011	0.076
	(0.027)	(0.028)	(0.019)	(0.494)	(0.024)	(0.140)
Concentration	0.003	0.000	-0.006	-0.545	-0.023	0.096*
	(0.014)	(0.014)	(0.009)	(0.355)	(0.017)	(0.057)
Dependency ratio	0.009	0.000	0.027	-0.346	-0.024	-0.081
	(0.042)	(0.045)	(0.026)	(0.554)	(0.024)	(0.148)
Unemployment rate	0.026	0.022	0.022	-0.458	0.002	0.194
	(0.036)	(0.037)	(0.027)	(0.611)	(0.026)	(0.159)
Read newspapers	-0.027	-0.011	0.002	0.467	-0.001	-0.000
	(0.028)	(0.032)	(0.015)	(0.532)	(0.015)	(0.102)
Registered voters	-0.379	-0.314	-0.378	0.251	-0.218	3.644***
	(0.451)	(0.389)	(0.346)	(10.500)	(0.248)	(0.730)
Second term	-0.108	-0.076	-0.044	4.232***	0.018	-0.135
	(0.063)	(0.063)	(0.039)	(1.249)	(0.042)	(0.568)
Over-id. restrictions	2.353	0.856	0.152	2.357	1.954	0.092
	[0.125]	[0.355]	[0.697]	[0.125]	[0.162]	[0.762]
Weak identification test	4.39	4.39	4.39	4.39	4.39	4.39
Municipalities	90	90	90	90	90	90
			Reduced form			
Rain	-0.303	-0.322	-0.103	-0.234	0.125	0.250
	(0.196)	(0.202)	(0.079)	(3.059)	(0.201)	(1.508)
Rain*coastal	0.384	0.299	0.088	-4.238	-0.253	0.097
	(0.218)	(0.225)	(0.102)	(3.621)	(0.213)	(1.523)

Notes: 2SLS estimation. Robust standard errors in parenthesis, (*) (**) (***) denote significance at the (10) (5) (1) percent level. All models include a constant, not reported. The dummy variable rain and its interaction with coastal region are used as instrument for voter turnout. Over-identifying restrictions tests the null that all the instrumental variables are orthogonal to the second-stage error term. The weak identification test refers to the Kleibergen–Paap Wald rk F statistic, robust to non-i.i.d. errors.

Table 10. Council composition and ideology: instrument $d(w)_{nt_n}$ (weather conditions)

Dependent variable:	Herfindahl Index Council	Herfindahl Index Winning coalition	Herfindahl Index Opposition parties	Margin of Majority	Vote share of Left-wing coalition	Vote share of Democratic Party
Column	(1)	(2)	(3)	(4)	(5)	(6)
Voter turnout	0.002	-0.000	0.015	-0.001	-0.042	-0.140
	(0.003)	(0.008)	(0.010)	(0.003)	(0.037)	(0.423)
Concentration	-0.003	-0.009*	0.003	-0.002**	0.016	0.094
	(0.002)	(0.005)	(0.006)	(0.001)	(0.021)	(0.228)
Dependency ratio	-0.007*	-0.019**	-0.003	-0.001	-0.009	0.317
	(0.004)	(0.009)	(0.011)	(0.005)	(0.044)	(0.453)
Unemployment rate	0.012***	0.029***	0.017*	-0.009**	-0.023	0.765**
	(0.003)	(0.008)	(0.010)	(0.004)	(0.044)	(0.356)
Read newspapers	-0.009***	-0.022***	-0.005	-0.002	0.090***	-0.300
	(0.003)	(0.007)	(0.008)	(0.005)	(0.029)	(0.317)
Registered voters	-0.045	-0.087	-0.040	-0.074**	0.691	-0.102
	(0.033)	(0.101)	(0.104)	(0.029)	(0.661)	(6.625)
Second term	-0.013	-0.029	-0.014	0.002	-0.065	0.223
	(0.009)	(0.022)	(0.021)	(0.007)	(0.068)	(0.984)
Over-id. restrictions	0.019	0.469	0.157	0.764	0.017	1.579
	[0.890]	[0.493]	[0.692]	[0.382]	[0.897]	[0.209]
Weak identif. test	4.39	4.39	4.39	4.39	4.39	4.39
Municipalities	90	90	90	90	90	90

Notes: 2SLS estimation. Robust standard errors in parenthesis, (*) (**) (***) denote significance at the (10) (5) (1) percent level. All models include a constant, not reported. The dummy variable rain and its interaction with coastal region are used as instrument for voter turnout. Over-identifying restrictions tests the null that all the instrumental variables are orthogonal to the second-stage error term. The weak identification test refers to the Kleibergen–Paap Wald rk F statistic, robust to non-i.i.d. errors.