Voter Turnout and City Performance

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[preliminary]

Abstract

We study the impact of exogenous variation in Italian municipal elections’ voter turnout rates on city performance scores and elected mayors’ indicators of valence. First, we build a simple model of voluntary and costly expressive voting, where the relative weight of ideology and valence issues over voting costs determines how people vote, and if they actually turn out to vote. We show that the cost of voting depresses voter turnout, yet can raise the chances of selecting higher valence candidates and thereby improve government performance. Empirically, city performance is measured along a number of dimensions including a unique index of overall urban environmental quality, and mayors’ valence is proxied by variables reflecting their professional experience and competence. We exploit exogenous variation in voter turnout rates through the 2000s due to the presence of concomitant regional, general and European parliament elections, and to weather conditions (rainfall) on the election day. The staggered nature of the municipal election schedule and the availability of two consecutive elections for each municipality over the decade allow us to control for year-specific nationwide influences on local elections, as well as for time-invariant local attitudes towards voting. The results from a number of specifications and quality of policy-making indicators consistently point to a negative causal impact of voter turnout rates on the performance of cities and the valence of mayors. Finally, the paper designs a pre-analysis plan to be applied to the city performance data wave that will become available in December 2014.

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Key words: local elections; voter turnout; urban environmental quality; weather; pre-analysis plan.

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1 Introduction

Low and declining voter turnout rates across the Western democracies have been a cause of concern for political observers and academics alike for decades (Reif and Shmitt, 1980; Boyd, 1981). The premise that massive vote abstention poses a threat on the nature of the democratic process, possibly altering the representation of interests of the diverse segments of society due to systematic differences in preferences for public policy between voters and nonvoters and jeopardizing the selection properties of voluntary voting systems, seems to call for institutional remedies and registration/voting mechanisms aimed at boosting voters’ participation (Lijphart, 1997).

However, the premise that high or nearly universal rates of voter participation are desirable, and that variation in turnout might have significant policy consequences, does not seem to be so firmly grounded either in theoretical or in empirical research in this area. From a theoretical point of view, Borgers’ (2004) influential paper showed that if voting is costly and instrumentally motivated, and voters have private values (own ideological views) over candidates’ position issues, turnout tends to be inefficiently high due to the fact that each voter ignores the negative pivotal externality he inflicts on the other voters when deciding to vote. Krasa and Polborn (2009) extended Borgers’ analysis to larger electorates and asymmetric groups. They identified a counteracting positive externality that voters from a group generate on abstainers from the same group, and stated the conditions under which mandatory voting policies can be beneficial. Within a framework where voters have both private values and commonly shared values, Ghosal and Lockwood (2009) further proved that low voter turnout resulting from an information-driven switch from private value (ideological) to common value (candidates’ competence) voting might lead to better selection of agents, and be welfare increasing. By relying on an expressive voting framework, Aldashev (2008) modelled the effect of the level of voter turnout on political rent accumulation, and showed that lower turnout due to higher ideological mobility of voters actually reduces equilibrium rents by self-interested politicians, and can therefore increase welfare.

Indeed, most of the strength of the ‘get out the vote’ arguments arises from models where voters are heterogeneous, with wealthy and aged individuals voting in larger proportions than younger and less well off ones. This renders the redistributive content of public policy crucially dependent on the share, composition and skewness of the electorate that actually cast their votes. In fact, a number of recent empirical findings suggest that raising voter turnout tends to help progressive candidates, favor minority and disadvantaged groups, lead to more redistribution and welfare (pension and education) spending, and in the end contribute to fill the ‘democratic deficit’ of poor participation contests (Fowler, 2013; Rauh, 2014; Leon, 2013). Overall, though, the empirical evidence
is mixed. Even when the focus of the inquiry is on the degree of pure redistribution that can be obtained in a representative democracy system, some pieces of empirical research challenge the low turnout-poor democracy postulate, and question the desirability, or even the relevance, of an increase in voter turnout per se (Lutz and Marsh, 2007).

Mueller and Stratmann (2003) investigate the voter participation-demand for redistribution nexus, and find that higher turnout is accompanied by the implementation of policies that actually retard growth. Relatedly, Fumagalli and Narciso (2012) regard voter turnout as the underlying link between democratic institutions and country performance, and show that institutions that are typically accompanied by higher voter turnout (parliamentary regimes and proportional voting rules) also tend to be associated with higher redistributive spending that lowers economic growth rates. Citrin et al. (2003) assessed the partisan impact of higher turnout in Senate elections using US state-level exit polls and Census data to simulate the outcome of those elections under universal turnout. They concluded that while nonvoters are generally more likely to be Democratic than voters, very few election outcomes would have changed had everyone voted. Based on data from European election studies in 1989, 1994, 1999 and 2004, van der Eijk and van Egmond (2007) estimated that turnout size effects on parties’ shares of the vote in national elections were generally small (with right-wing parties benefiting only slightly from low turnout) and happened to be decisive in only few cases. Rosema (2007) similarly concludes that, since the political sophistication of those who participate is relatively high, the typically more informed choices of those voters tend to counterbalance the imperfect representation effect due to low participation, which implies that low turnout might, in fact, improve the selection property of elections. Lutz (2007) argues that the level of information held by voters matters significantly more for the outcome of a popular (direct democracy) vote than does the level of turnout in itself, while Fisher (2007) disputes the existence of a causal effect of turnout on the left share of the vote in national elections across countries. Finally, Ferwerda (2014) exploits the gradual repeal of compulsory voting in Austria to isolate the causal effect of turnout decline on party vote share shifts, and finds a generally insignificant turnout effect in spite of large, two-digit rate declines in voter participation.

Notwithstanding the significantly larger attention devoted by the scholarly literature to the trajectory of voter turnout in parliamentary and presidential elections than in local elections (Wattenberg, 2002), the most recent years have witnessed growing academic attention towards the analysis of the impact of voter turnout on policy-making in decentralized government structures. Thanks to the increasing role of cities in terms of contribution to economic growth, business attraction and pressure on the environment, democratic participation in municipal elections in urban areas seems no less important in principle than
in nationwide contests. Moreover, the larger the degree of political and fiscal decentralization, the more the patterns of participation in local elections might have an impact on the level and mix of locally provided public services and ultimately on people’s welfare. It has been argued in particular that low turnout elections could influence the collective place-shaping decision processes, and favor the emergence of ‘regimes’ based on business community rule (real estate developers, trade associations, and other ‘growth machines’) and elitism (Harding, 1994; Dowding, 2001; Cooper et al., 2005), thus putting the somewhat sinister “who governs?” question (Dahl, 1961) center stage in contemporaneous local electoral politics analysis (Stone, 2012). Moreover, in a low participation environment, local communities might be more vulnerable to capture by interest groups having the most to gain and ending up with a disproportionately large representation of their own stakes (Berry, 2009).

Systematic empirical investigations in this sense, though, have been rare, due to the lack or sparsity of detailed information on local elections. Hajnal and Trounstine (2005) were among the first to offer credible evidence that the less regular voting participation of Latinos and Asian American citizens leads to their systematic underrepresentation on US city governing bodies, and that moving the dates of local elections to coincide with more salient national contests would substantially moderate such phenomenon. By analyzing school district elections in a number of US states and exploiting the exogenous timing of election schedules, Anzia (2011, 2012) finds 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 (2013) uses a constitutional change in Sweden in 1970 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. Geys et al. (2010) find larger turnout rates as well as the presence of non-ideological ‘voter unions’ in German municipal elections to be associated with higher efficiency in the provision of local public services. On the other hand, Revelli (2013) examines the degree to which decentralization institutions affect the stakes of local elections, and shows that deemphasization of position issues in local elections due to fiscal centralization (in terms of state-imposed tax limits on local authorities) tends in fact to favor voters’ party line crossing and, while lowering turnout in local elections, raise the quality and accountability of elected officials.

This paper aims at adding to the existing literature by investigating whether exogenous changes in the cost of voting affect the degree of voter turnout in municipal elections, and whether those turnout changes eventually have an impact on the quality of urban decision-making and on the performance of cities. The analysis uses data on large Italian cities through the 2000s, and is based on a theoretical model where institutions determine how people vote (i.e., either ac-
cording to candidates’ ideological views or to their valence), and circumstances (the cost of voting) determine if they actually turn out to vote. It is on the latter aspect that we focus, and exploit exogenous shocks to voter turnout - the presence of concomitant elections for higher levels of government and weather variation over election times within a given spatial unit (Dell et al., 2014) - to estimate its consequences on Italian cities’ performances and elected mayors’ traits. The staggered nature of the municipal election schedule and the availability of two consecutive elections for each municipality over the 2001-2010 decade allow us to control for year-specific nationwide influences on local elections, as well as for time-invariant local attitudes towards voting. The results from a number of specifications and quality of policy-making indicators consistently point to a negative causal impact of voter turnout rates on the performance of cities and on the indicators of valence of elected mayors, suggesting that a switch from low to high voter turnout might not always be beneficial.

The rest of the paper is organized as follows. The next section develops a simple theoretical framework to highlight the impact of the cost of voting on voter turnout and candidate selection, and derives a number of testable predictions. Section 3 sets up the empirical strategy, and discusses the two sources of exogenous variation in voter turnout that we exploit and the key indicators of city performance that we use. Section 4 presents the estimation results, and section 5 concludes.

2 Theoretical framework

Let two candidates \((l, r)\) run for mayoral office in city \(n\) \((n = 1, ..., N)\). The candidate securing the majority of the votes of the city’s electorate in a ‘winner-takes-all’ race sets the one-dimensional policy \(\pi^x, x \in \{l, r\}\), for the subsequent term of office based on his ideology - say, a high versus a low local income tax rate, or large versus small expenditures on local public education. There is no uncertainty about the policy that candidate \(x\) will set if elected. The ideology of candidates is common knowledge.\(^1\)

Voting is voluntary, costly, and driven by two expressive motives (Hamlin and Jennings, 2011): a private value or position issue motive (candidate’s ideology determining the policy \(\pi^x\)) and a common value motive (candidate’s valence).\(^2\)

\(^{1}\)We abstract entirely here from the issue of how the policy is determined, and assume it is exogenously fixed, as is plausibly the case in a strict party discipline environment. Ansolabehere and Snyder (2000), Kartik and McAfee (2007) and Bernhard, Camara and Squintani (2011) analyze how candidates’ valence affects their positioning on the ideological spectrum.

\(^{2}\)This is similar to Ghosal and Lockwood (2009), though in their model voting is instrumental and takes place either according to voters’ private preferences or to noisy signals about candidate competence, while in Krishna and Morgan (2011) the former always dominates the latter. Aldashev (2008) relies on the hypothesis of expressive voting. In his model, citizens are either ideologically motivated or neutral, and both care about the performance (rent...
As far as the former is concerned, voter $j$ in city $n$ is ideologically attached to candidate $x$ with probability 0.5, meaning that no candidate enjoys a systematic ideological bias in his favor. Valence is instead a commonly valued issue linked to imperfectly observed candidates’ inner characteristics, e.g., competence or probity (Besley, 2005). No instrumental motive is foreseen in voters’ decision to cast a vote due to the fact that the electorate is large enough to make the chance of a single vote being decisive in a mayoral election negligible.

Voters’ behavior in the wake of an election call can be interpreted as consisting of two stages (Ghosal and Lockwood, 2009). First, the relative weight of ideology and valence issues determines whether, conditional on turning out to vote, individuals vote according to ideology or valence. Second, the comparison of the expressive benefits of voting with the actual costs of voting determines whether people actually turn out to vote.

### 2.1 Ideology versus valence voting

Consider the private value (ideology) versus common value (valence) voting decision first. Each voter $j$ has a set of beliefs $\{\iota_j, \kappa_j\}$, with $\iota_j \in \{l, r\}$ being the ideological attachment to either of the candidates’ policies reflecting identification with his view of the world, and $\kappa_j \in \{l, r\}$ being voters’ belief about candidates’ valence. Assume that candidate $x$ is valent in state of the world $s^x \in \{s^l, s^r\}$, with the two states of the world being equally likely ex ante, and that voter $j$ receives a signal $\kappa_j$ before the election such that $\Pr(\kappa_j = x|s = s^x) = q > 0.5$.

The valence signal may or may not match a voter’s ideological preference $\iota_j$. Based on their sets of beliefs, voters can be categorized as follows.

**Definition 1** Voter $j$ is said to be ideological if the expressive benefit of voting by ideology is larger than the expressive benefit of voting by valence. Conditional on turning out, (s)he votes according to $\iota_j$ irrespective of $\kappa_j$.

**Definition 2** Voter $j$ is said to be pragmatic if the expressive benefit of voting by valence is larger than the expressive benefit of voting by ideology. Conditional on turning out, (s)he votes according to $\kappa_j$ irrespective of $\iota_j$.

Conditional on turning out to vote, ideological voters systematically ignore the candidates’ valence signals they receive, and blindly stick to their ideology. Pragmatic voters are instead willing to ‘cross party lines’ (Casey, 2012), and vote for the candidate they believe to be the most suited to the state of the world that the signal suggests to be the most likely.

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extraction) of politicians.
2.2 Turnout

Consider the turnout decision next. Based on the comparison between the expressive benefits and the costs of voting, the net benefit of turning out to vote \((e_j)\) is:

\[
e_j = \begin{cases} 
[i_j + v_j] - c_j & \text{if } \kappa_j = \kappa_j \\
\max\{i_j, v_j\} - c_j & \text{if } \kappa_j \neq \kappa_j
\end{cases}
\]

(1)

where \(i\) is the expressive benefit of voting by ideology, \(v\) is the expressive benefit of voting for the candidate that is believed to be valent, and \(c\) is the cost of voting. A voter turns out to vote \((t_j = 1)\) if the net benefit is positive:

\[
t_j = 1(e_j > 0)
\]

(2)

According to equation (1), voters are more likely to turn out if the valence signals match their ideological views \((\kappa_j = \kappa_j)\) than in the case of clash between valence signal and own ideology \((\kappa_j \neq \kappa_j)\). We hypothesize that:

\[
v_j = V + \varepsilon_j,
\]

where \(V\) is a positive parameter, and \(\varepsilon\) is independently and uniformly distributed on \([-\sigma, \sigma]\), with \(0 \leq \sigma \leq V\). We further assume that the common value (valence) issue is orthogonal to ideology: \(E[\varepsilon|i] = 0\). As for ideology, \(i\) is assumed to be independently and uniformly distributed on \([0, I]\), with \(I > V\), and cumulative distribution function \(\Phi = \frac{i}{I}\). The voting cost \(c_j\) is instead allowed to be correlated across voters due to the fact that individuals residing in a jurisdiction face the same or similar environmental conditions and institutional framework.

Figure 1 offers a graphical representation of the forces determining how people vote, and whether they turn out to vote. Voters are first ordered according to the relevance of the private value issue \(i\) to them, with \(\Phi\) on the horizontal axis indexing voters’ cumulative distribution function.\(^3\) For simplicity, assume that the valence benefit \(v_j\) is constant across voters \((\sigma = 0)\), and that \(I > 2V\), implying that the majority of voters are ideological.\(^4\) The former hypothesis is more restrictive than is actually needed, but it greatly simplifies the analysis that follows.\(^5\)

Figure 1 first depicts how people vote based on the size of the ideological expressive benefit \(i\) (the straight line from the origin of the axes) relative to the

\(^3\)The actual shape and position of the cumulative distribution of the expressive ideological value of voting is likely to vary depending on the institutions governing the local government structure. In particular, the higher the degree of political and fiscal decentralization, the higher the ideological value of voting (Revelli, 2013). In this paper, we take decentralization institutions as exogenously fixed, and focus on the role of circumstances determining the cost of voting.

\(^4\)If \(I = 2V\) implies that exactly half the electorate is ideological and half is pragmatic. All graphs are drawn by setting: \(V = 3, I = 8, q = 0.7\).

\(^5\)In fact, it is less restrictive than is done in most existing literature, e.g. Krishna and Morgan (2011), where ideology always dominates valence, or Börgers (2004), Krassa and Polborn (2009) and Taylor and Yildirim (2010), where the valence voting motive is absent.
valence-related expressive benefit $v$ (the horizontal line at $V$). The fraction of
voters $\Phi = \frac{V}{V+I}$ in figure 1 have $i_j < V$ and vote pragmatically, i.e., according
to the valence signal they receive, while the fraction $1 - \frac{V}{V+I}$ have $i_j > V$, and
vote ideologically, irrespective of the valence signal. As for the turnout decision
(equations (1) and (2)), voters for whom the valence signal matches their ideo-
logical views have benefits from turning out to vote as given by the solid straight
line $m (i+v)$ in figure 1, while ‘no match’ voters - valence signals clashing with
ideological views - have benefits described by the solid piecewise linear curve
$nm \ (\max \{i, v\}$).

Say that the cost of voting is homogeneous across voters at $c_j = c > 0$.
According to equations (1) and (2), all voters for whom the benefits from voting
($m$ or $nm$) exceed $c$ will turn out, while the others will abstain.

Figure 1 Ideology and valence in voting

Figure 2 depicts how pragmatic voters’ turnout, ideological voters’ turnout,
and total turnout measured on the vertical axis respond to changes in the cost
of voting. First, the effect of the cost of voting on pragmatic voters’ turnout
$t(v)$ expressed as a percentage of the total electorate is:

$$ t(v) = \begin{cases} 
\frac{V}{V+I} & c < V \\
\frac{V}{V+I} - \frac{c}{2V} & \text{if } V < c < 2V \\
0 & c > 2V 
\end{cases} \quad (3) $$

8
As figure 1 shows, all pragmatic voters \((\frac{V}{I})\) turn out when \(c < V\), while none of them participates when \(c > 2V\) even if the signal matches their ideological views. For \(V < c < 2V\), the only pragmatic voters that turn out are those for whom the valence signal matches their ideological views (i.e., are on line \(m\)), and the total expressive benefits from voting strictly exceed costs: \(i_j + V > c\). Given that \((\frac{V}{I} - \frac{V}{I})\) voters have \(i_j + V < c\) and \([\frac{V}{I} - (\frac{V}{I} - \frac{V}{I})]\) have \(i_j + V > c\), and since the electorate is equally split among the two candidates along ideological lines, the proportion of pragmatic voters turning out for \(V < c < 2V\) is \(\frac{1}{2} \cdot (\frac{2V - c}{V}) = \frac{V}{T} - \frac{c}{T}\).

Figure 2 Turnout

On the other hand, ideological voters’ turnout \(t(i)\) declines with the cost of
voting according to:

\[
t(i) = \begin{cases} 
1 - \frac{V}{7} & c < V \\
1 - \frac{V}{7} - \frac{c}{27} & V < c < 2V \\
1 + \frac{V}{27} - \frac{c}{7} & \text{if } 2V < c < I \\
\frac{1}{2} + \frac{V}{27} - \frac{c}{27} & I < c < V + I \\
0 & c > V + I 
\end{cases}
\]  

(4)

By the same line of reasoning as for pragmatic voters, and as figure 1 shows, all ideological voters \(1 - \frac{V}{7}\) turn out for \(c < V\), while a fraction \(\frac{1}{2} \left( \frac{V}{7} - \frac{c}{7} \right)\) of them - i.e., those for which the valence signal does not match their ideological stance (line \(\text{mm}\)) and \(i_j < c\) - abstain if \(V < c < 2V\). For \(c > 2V\), some of the ‘match’ ideological voters abstain too (those that are located close to \(\frac{V}{7}\) on line \(\text{m}\) in figure 1, and for whom \(i_j + V < c\)). As the cost of voting further increases \((c > I)\), the only voters participating in the election have a valence signal coinciding with their (intense) ideological views. Finally, ideological voters’ turnout falls to zero for \(c > V + I\).

As a result of equations (3) and (4), total turnout \((t\) in figure 2) is:

\[
t = \begin{cases} 
1 & c < V \\
1 + \frac{V}{27} - \frac{c}{7} & V < c < I \\
\frac{1}{2} + \frac{V}{27} - \frac{c}{27} & I < c < V + I \\
0 & c > V + I 
\end{cases}
\]  

(5)

Based on the above turnout trajectory, consider now how the cost of voting affects the probability that, given the state of the world that is realized, the valent candidate is elected, call it \(P(v)\). Let \(t(i)^m\) and \(t(i)^{nm}\) denote the turnout rates of ideological voters when the signal matches (the candidate they vote for is valent with probability \(q\)) or does not match their ideological views (the candidate they vote for is valent with probability \(1 - q\)) respectively. Given that pragmatic voters turn out at the rate \(t(v)\) - equation (3) - and always vote ‘correctly’ according to their valence signals, the probability of electing the
valent candidate is:

\[ P(v) = \frac{[t(v) + t(i)^m] q + t(i)^n(1 - q)}{t} \]  (6)

\[
= \begin{cases} 
\left[ \frac{V}{T} + \frac{1}{2} \left( 1 - \frac{V}{T} \right) \right] q + \frac{1}{2} \left( 1 - \frac{V}{T} \right) (1 - q) & c < V \\
\frac{V}{T} q + \frac{1}{2} \left( 1 - \frac{c}{T} \right) & V < c < I \\
q & c > I 
\end{cases}

Figure 3 draws the probability (6) as a function of the cost of voting. First, \( P(v) \) expectedly falls as soon as the cost of voting surpasses \( V \) due to the fact that pragmatic voters for whom the signal collides with their (weak) ideological stances (corresponding to horizontal segment \( Vg \) in Figure 1) abstain, so that ‘good voters’ are lost to the democratic process because of the rise in the cost of voting. This result is compatible with the widely held view, recently formalized by Aldashev (2008), that a decline in turnout might worsen the quality of the democratic process and lead to the selection of less valent candidates.

Figure 3 Candidate valence and the cost of voting

For \( c > V \), though, the probability of electing the valent candidate increases with \( c \). This is due to the fact that, as \( c \) rises, the share of voters casting their votes according to the ‘correct’ signal increases relative to the share of
ideological voters blindly voting against their signals. \( P(v) \) keeps on increasing until cost \( I \) is reached, where only ideological voters for whom the valence signal matches their ideological views (corresponding to segment \( h[V + I] \) in figure 1) turn out to vote. At \( c \geq I \) in figure 3, all those who turn out vote according to the valence signal, and \( P(v) \) equals \( q \). It is easily verified that \( P(v) \) at \( c < V \) (where, as figure 2 shows, total turnout is 100%) is strictly lower than \( q \) if \( q > 0.5 \) (the signal is informative). Consequently, the probability of electing the valent candidate is maximized when the voting cost is at least as large as \( I \). Somewhat unexpectedly, maximization of the chances of electing a valent candidate requires both pragmatic voters - i.e., those who always vote according to valence - and ideological voters whose signal does not match their ideological views to abstain, and only the somewhat radical subgroup of ideological voters for whom the common value signal matches their private value views to show up at the polls.

Finally, consider how the cost of voting influences the win margin \( (w) \) of the elected candidate. Based on equation (6), the win margin is defined as the difference in votes between the two candidates as a proportion of the votes gained by the elected candidate:

\[
w = \begin{cases} 
1 - \frac{1 - \frac{q}{q}}{q + \frac{1}{q - 1}} & \text{if } c < V \\
1 - \frac{1 - \frac{q}{q}}{q + \frac{1}{q - 1}} & \text{if } V < c < I \\
1 & \text{if } c > I 
\end{cases}
\]  

(7)

Along with the decline in popularity of the valent candidate depicted in figure 3 when the cost of voting surpasses \( V \), the win margin of the elected candidate first falls. However, the win margin is strictly increasing in \( c \) for \( c > V \), and equals 100% when \( c > I \). When only radical voters for whom the valence signal matches their ideological views turn out at the polls, the valent candidate is elected by a plebiscitary vote.

### 3 Empirical analysis

The model in section 2 delivers predictions in terms of the impact of the cost of voting on turnout and election outcomes. This section first sets up the empirical model and the estimation approach to be applied onto data of a longitudinal nature. Next, it discusses the two sources of turnout variation arising from shocks to the cost of voting that we exploit in the empirical analysis. Finally, it illustrates the dataset.
3.1 Econometric strategy

Let \( v_{ny} \) denote an indicator of valence of the mayor of city \( n = 1, \ldots, N \) in a given observation year \( y \), and \( \Delta y_n \) denote his seniority in terms of the number of years that have elapsed since his election. \( \Delta y_n \) varies across cities due to the presence of a staggered election schedule. In particular, the mayor in office in city \( n \) in year \( y \) was elected at time \( y'_{0n} = y - \Delta y_n \), where \( 1 \leq \Delta y_n < \Delta y \), and \( \Delta y \) is the statutory length of the term of office. At the election held at time \( y'_{0n} \), turnout \( t_{ny'_{0n}} \) was observed in city \( n \).

Following the theoretical model, equation (8) below allows \( v_{ny} \) to be a function of the turnout rate registered in year \( y'_{0n} \), as well as of time-invariant characteristics of the locality \( f_n \) and time-varying unobservables \( \varepsilon_{ny} \), both of which might in principle be correlated with \( t_{ny'_{0n}} \):

\[
v_{ny} = v(t_{ny'_{0n}}) + f_n + \varepsilon_{ny} \tag{8}
\]

First, given that \( E(\varepsilon_{ny} | t_{ny'_{0n}}) \neq 0 \) if, say, expectations about mayor’s valence (later realized at time \( y' \)) influence the rate of turnout at time \( y'_{0n} \), one needs to exploit exogenous circumstances (cost of voting indicators, \( c \)) that plausibly affect turnout and are orthogonal to \( \varepsilon_{ny} \), and use \( c_{ny'_{0n}} \) as instruments for \( t_{ny'_{0n}} \) based on \( E(\varepsilon_{ny} | c_{ny'_{0n}}) = 0 \). On the other hand, city’s time-invariant characteristics (e.g., social capital) that might be systematically correlated with turnout are eliminated by first-differencing equation (8):

\[
\Delta v_{ny} = \Delta v(t_{ny'_{0n}}) + \Delta \varepsilon_{ny} \tag{9}
\]

where: \( \Delta v_{ny} = v_{ny} - v_{ny'_{0n}}, \) with \( y'_{0n} = y - \Delta y \), and: \( \Delta v(t_{ny'_{0n}}) = v(t_{ny'_{0n}}) - v(t_{y'_{0n}}) \), with \( y'_{0n} = y'_{0n} - \Delta y \). Estimating equation (9) requires using information on the valence of the previous term of office’s mayor \( (v_{ny'} \) and the level of turnout that was registered when that mayor was elected \( (t_{y'_{0n}}). \) Since \( y'_{0n} = y_{0n} - \Delta y = y - \Delta y_n - \Delta y, \) and given that the term of office lasts five years, this requires information dating up to a decade back.

Consider now the case where \( v_{ny} \) is not directly observed, but a manifestation of it \( (\pi_{ny}) \) is. \( \pi_{ny} \) might capture some outcome of city government policy (call it ‘city performance,’ measured along a number of dimensions to be discussed below) that can be partly attributed to the mayor’s valence, after accounting for the underlying time-invariant traits of locality \( n \) \( (h_n) \) and unobserved time-varying influences on city performance \( (\eta_{ny}) \), as in equation (10):

\[
\pi_{ny} = \pi(t_{ny'_{0n}}) + h_n + \eta_{ny} \tag{10}
\]

After differencing \( h_n \) out as in equation (11), endogenous turnout is instrumented by \( \Delta c_{ny'_{0n}} \):

\[
\Delta \pi_{ny} = \Delta \pi(t_{ny'_{0n}}) + \Delta \eta_{ny} \tag{11}
\]

Estimating equation (11) of course poses the same data length requirement as equation (9).
3.2 Exogenous variation in voter turnout

As the recent research discussed in the Introduction suggests, the role of citizens’ participation in shaping collective choices in representative democracies is best understood if one can properly address the key question of the causal impact of voter turnout on the characteristics of the candidates that are elected and on the quality of the policies that are actually implemented. It is therefore crucial to rely on sources of variation in voter turnout that are exogenous to the outcome variables that we want to measure. An ideal, though rare, opportunity to assess the causal effect of voter turnout on government performance is provided by the adoption or repeal of compulsory voting rules. This allows to assess the effects of near-universal turnout relative to the case of sparser voluntary voting. Fowler (2013) exploits the differential adoption of compulsory voting laws across Australian state assembly elections and employs a difference-in-difference approach to show that compulsory voting caused a considerable increase in voter turnout and in the vote share of the Labor Party. Moreover, he exploits the adoption of compulsory voting at the national level, and finds by a synthetic control analysis comparing Australia with a number of OECD countries that the nationwide adoption of compulsory voting caused significant increases in welfare spending. A similar approach is employed by Ferwerda (2014) with regard to the differential repeal of compulsory voting laws in Austria.

Given the context of municipal elections over a relatively short time period (a decade) that we analyze here, we cannot rely on any such dramatic change in voting rules that might have a substantial and differential impact on the cost of (not) voting and on the resulting level of voter turnout. In fact, the Italian municipal election system underwent a major reform in the early 1990s, with the introduction of direct election of the mayor, and remained virtually unchanged since. However, we are able to exploit two important sources of exogenous variation in local turnout that are linked to the multi-tiered structure of local government and to the geographical nature of our data respectively.

The first exogenous source of variation that we exploit is of an institutional nature, and relies on the predetermined schedule of elections that are regularly held in Italy for representative assemblies other than municipal councils. The existence of a multi-tiered structure of government comprising two further levels of subnational representative assemblies (provincial and regional councils), the national level (two representative assemblies holding contemporaneous general elections), and the European parliament, generates an involved schedule of recurrent elections. Interestingly, those upper-tier elections are occasionally, though not always, held concomitantly as some of the municipal ones. 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 elections during the
same year, those elections do not necessarily occur on the same days. This gives rise to a number of overlapping electoral cycles across the national territory, including municipal elections taking place in years where no other major elections are scheduled; or municipal elections taking place in the same year as other major elections, but not on the same day; or finally municipal elections being held concomitantly as nationwide European and Italian parliament elections, or regionwide for some regional assemblies and governors. When elections for different tiers of government are held simultaneously, voters have the chance to cast a vote for all contesting candidates at the same polling station, thus experiencing a substantially lower cost of casting a vote for the relatively less salient election (presumably the municipal one) once they are at the poll to vote for the Prime Minister or regional governor. One can therefore expect turnout to be pushed up exogenously for mayoral elections that happen to take place in those circumstances, and, conditional on the time-invariant characteristics of the localities that can conveniently be controlled for by observing elections that are repeated over time (usually at a five years interval), for reasons that are orthogonal to the outcome variables (city performance scores and mayors’ valence indicators) that will be later realized.

The fact that concomitant elections can have an influence on voter turnout rates has long been acknowledged in the political science literature. Grouping expectedly less salient to more salient elections has been proposed as a potential remedy to the low level of voter turnout that is registered in the former (especially in the US local government system) when they are held off-cycle (Lijphart, 1997; Hajnal and Trounstine, 2005). However, only recently have some systematic attempts been made to precisely measure the effects of holding second-order elections simultaneously as first-order ones. Recent papers have explored in particular the effects of the election timing - on-cycle versus off-cycle - both on the political outcomes of elections and on the policies that are implemented. Anzia (2011) argues that the decrease in voter turnout that usually accompanies off-cycle or nonconcurrent elections creates a strategic opportunity for organized interest groups having larger stakes in an election outcome and turning out at high rates regardless of election timing, and being able to exert a stronger influence and succeeding to obtain more favorable policies than those made by officials elected in on-cycle elections. Using data on school district elections in the U.S., in which teacher unions are the dominant interest group, Anzia (2011) finds that districts with off-cycle elections pay experienced teachers more than districts that hold on-cycle elections. That result is confirmed in Anzia (2012), where the impact of a natural experiment is estimated that consists of a Texas law that forced a number of the state’s school districts to move their elections to the same day as national elections. The idea is that the

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6By major we refer to European, national and regional elections, with provincial elections usually being much less salient and exhibiting significantly lower voter turnout.
change in the state law allows estimation of the causal effect of the switch to on-cycle election timing on average district teacher salary, since teachers and their unions tend to be the dominant interest group in school board elections. Anzia (2012) finds that school districts that were forced to switch to on-cycle elections responded by paying lower salary raises to teachers, supporting the hypothesis that school district representatives elected by a larger number of residents were less responsive to the dominant interest group after the switch. On the other hand, and while adopting a similar empirical strategy, Berry and Gersen (2011) come to different conclusions. They analyze the effects of election timing on voter turnout and policy-making by exploiting a 1980s change in the California Election Code, which allowed school districts to change their elections from off-cycle to on-cycle, and estimate the effect of the resulting changes in voter turnout on a number of education policy outcomes. Their findings suggest that while the election timing reform indeed produced dramatic increases in voter participation in school district elections, the resulting changes in public policy - including teacher salaries and student achievement tests - were modest and mostly statistically insignificant.

The second exogenous source of variation in voter turnout that we will exploit consists of weather conditions on the day(s) municipal elections are held. The potential effect of the weather on voter participation in elections - and on the political outcomes and party shares in those elections - has long been conjectured or postulated by media, political practitioners, and political scientists, but it has been relatively little studied empirically. The first empirical work in this sense is Knack (1994). After setting up two competing models predicting an impact from weather conditions on election outcomes - one stressing the increased variance of vote shares in low turnout contests, and the other relying on differential response of party supporters - Knack (1994) merges individual level voting data with meteorological information to conclude that the effects of poor weather on the probability of voting and on party shares are generally nil. The only turnout-inhibiting effect appears on low civic duty individuals. Shachar and Nalebuff (1999) and Gatrell and Bierly (2002) find instead a large, negative effect of election day rain on turnout in US presidential elections. Gomez et al. (2007) examine the effect of estimates of rain and snow for each US county based on GIS interpolations from a large number of weather stations on voter turnout in US presidential elections. They find that rain and snow significantly reduce voter participation, and also tend to benefit the Republican party’s vote share. Subsequent work by Hansford and Gomez (2010) uses rainfall as an instrument for voter turnout in US Presidential elections to test a larger number of theoretical hypotheses concerning the predictability and anti-incumbency tendencies of elections: they find that higher turnout helps Democratic candidates, and generally results in greater levels of electoral volatility, while low turnout tends to validate the status quo by significantly advantaging the party of the incumbent
presents. On the other hand, Fraga and Hersch (2010) find that inclement weather (rain storms over half a century of presidential election days) have no substantive impact on turnout in environments that are highly competitive.

More recent European country-level studies employing weather-related variables to explain voter turnout rates lead to mixed results too. Eisinga et al. (2012) use data on Dutch municipal-level turnout in parliamentary elections along with election day weather from the nearest weather stations (rainfall, temperature, sunshine duration) and find significant and large effects of weather conditions on voting, with warm and sunny days witnessing larger turnout. Artes (2014) uses election day rainfall data from local weather stations in Spain as an instrument for municipal-level turnout in Spanish General Elections, and finds that participation is lower and conservatives’ vote shares are higher in rainy days. On the other hand, adverse weather conditions do not seem to have any significant effect on electoral participation in Sweden: Persson et al. (2014) use a number of distinct data sources (aggregate turnout data for the 290 Swedish municipalities; individual level data from the Swedish National Election Study; register-based surveys) to show that bad weather has no significant effect on the likelihood of voters to turn out to vote.

In fact, the effect of weather conditions on electoral participation seems a priori uncertain. Adverse weather affects both the cost of going to the polls - though plausibly in a far from dramatic way in most circumstances - and the utility of performing alternative activities over what in most countries, including Italy, is an election weekend during Spring through Summer. This makes the final effect of weather conditions in a locality on the level of voter turnout in municipal elections an empirical question, and might explain the diverse results emerged in the literature.

3.3 Data

We use data on municipal elections in the main (provincial borough) Italian cities through the 2000s. The sample includes 77 municipalities for which we have data on all the variables of interest: city performance scores, electoral results, and exogenous determinants of voter turnout (see the data Appendix for details).

In Italy, direct mayoral elections take place every five years, with a runoff stage among the two most voted candidates if none gets more than 50% of the votes in the first stage. Voters express a preference for a mayor candidate as well as for a councillor candidate if they wish. 60% of the council seats are assigned to the councillor candidates belonging to the political parties forming the coalition supporting the mayor candidate that is elected. Voting is formally

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On the eve of a controversial popular initiative referendum in June 1991, Prime Minister Bettino Craxi provocatively encouraged voters to head to the beaches instead of the polls.
mandatory for all aged above 18, though no sanctions exist for abstainers. The
election schedule across the country is staggered, meaning that municipal elec-
tions occurred in each of the 2001-2010 years, as shown in table 1. Voter turnout
in municipal elections is reported in the central part of table 1, and can vary
considerably across cities (from a minimum of 61.75% to a maximum of 89.43%).

We explore the effect of voter turnout on performance indicators that refer
to the quality of life in the cities in terms of economic, social and environmental
aspects, and on elected representatives’ characteristics that should proxy their
valence. In particular, we measure city performance by the comprehensive index
of city environmental performance that is delivered every year by Legambiente,
an independent nonprofit organization, for Italian province boroughs (Bianchini
and Revelli, 2013). We focus on the environmental quality scores that were reg-
istered two years after municipal-level elections have occurred, and that are
summarized in the last columns of table 1. The city score is based on a large
number of variables including green space availability, air quality in terms of pol-
lutant emissions and its consequences on human health, drinking water quality,
public transportation systems, energy consumption and waste recycling perfor-
ance. The score ranges from 0 to 100, and can be interpreted as the degree
to which a city performance approaches a feasible optimal performance. Given
their institutional role in environmental monitoring, regulation and protection,
the impact of city governments on environmental performance can be substan-
tial. The annually released city ranking attract considerable media attention,
fostering awareness among citizens about the quality of their urban environ-
ment and the ability of city governments to adequately preserve it. In fact,
while urban environmental quality is of course not entirely under control of
municipal governments also due to possibly relevant spillovers from nearby ju-
risdictional, the Legambiente ranking implicitly constitutes an assessment of the
performance of local policy-makers in managing their environmental protection
tasks (Bianchini and Revelli, 2013).

Let \( \pi_y \) denote the vector of city performance scores that becomes available
in year \( y \). Due to lags in information gathering and elaboration, the variables
(\( x \)) used in the construction of the rating refer to the previous year and, for a
few categories for which information is missing (i.e., not yet gathered), to two
years back:

\[
\pi_y = f(x_{y-1}, x_{y-2})
\]  

(12)

This timing implies that governments that went in power in year \( y - 3 \)
are deemed responsible for the city performance that is reflected in the ratings
released in year \( y \), and that municipalities are compared keeping the seniority of
the government constant (i.e., two years).\(^8\) Table 2 summarizes the sequence of

\(^8\)Our main findings in Section 4 hold also if city performance is measured three years after
the elections and, hence, the analysis is performed on a smaller sample that includes the
2001-2009 municipal elections only - since data on city performance scores are available up to
events for the two waves of city performance scores that we will use (2004-2008 and 2009-2013).

Figure 4 depicts the vector of Legambiente scores published between 2004 and 2008 against the rates of voter turnout that were registered in the years 2001-2005 in the upper panel, and the scores published between 2009 and 2013 against voter turnout in 2006-2010 in the bottom panel. The linear fit line shows a negative cross-sectional correlation between turnout and city performance in the 77 cities of our sample. When regressing urban environmental scores on turnout rates, the coefficient is negative and statistically significant in both cross-sections: an increase in turnout of ten percentage points tends to be associated with a 3.7 percentage points worse performance in the first cross-section, and with a 4.3 percentage points worse performance in the second cross-section. In figure 5 we consider the same data in first differences, and find that also when any time invariant omitted variable is differenced away, an increase in voter turnout is significantly correlated with a lower city performance score.

Finding a negative and significant association between city performance and electoral participation may be striking at a first glance. As illustrated in section 2, however, this association may arise in a model where the cost of voting determines who goes to vote, and in turn the quality of the elected government. With such descriptive evidence at hand and the interesting issues it poses, we proceed to test whether there is something more structural in nature behind the cross-sectional associations of city performance and voter turnout rates depicted in figures 4 and 5, and try to identify the causal effect of voter turnout on mayors’ valence indicators.

4 Results

The estimation results are reported in table 3. First, columns (1) and (2) display mainly for illustrative purposes the OLS estimates of a city performance determination equation on the distinct cross-sections of years 2001-2005 and 2006-2010 respectively. In addition to voter turnout, those regressions include time dummies for the years when turnout was recorded in order to account for year-specific nationwide influences on local elections, as well as for time-invariant local attitudes towards voting and year-specific measurement issues in Legambiente scores if any. The results confirm the negative correlation of voter turnout and city performance detected in figure 4. The time effects suggest that governments elected in 2003-2005 achieved better performance scores on average in the first cross-section, a result that may depend on several unobserved factors that these simple cross-sectional regressions cannot account for. Column (3) of...
Table 3 report the results from estimation of equation (11), where time-invariant city characteristics that might be correlated with turnout rates are differenced away. The results from a simple OLS regression with data in first differences indicate that better city performances are significantly associated with lower turnout, a decrease in electoral participation of ten percentage points being associated with a 4.8 percentage points better performance.

Of course, the above evidence is still only suggestive of a negative correlation of turnout and the performance of cities, and cannot be given a causal interpretation. Indeed, the turnout effect that emerges there might be due to time-varying unobservable forces driving both turnout and city performance indicators. To address this issue, we apply instrumental variables (IV) techniques to estimate equation (11). The presence of concomitant regional, general and European parliament elections, and information on weather conditions (rainfall) on the election day provide the exogenous variation in voter turnout rates through the 2000s we need to address endogeneity issues. In particular, we build a vector of dummy variables for the presence of concurrent elections at the time of municipal elections (regional, general or European elections), and we use election day weather conditions in the localities where elections took place. Moreover, the staggered nature of the municipal election schedule and the availability of two consecutive elections for each municipality over the decade allow us to control for time-invariant local attitudes towards voting.

Column (1) of table 4 reports estimates from the first-stage of a model where the instruments’ set for turnout includes dummy variables for concurrent elections only. In our sample of 154 overall municipal election events, national elections occurred in the same day as municipal elections in 24 cases, while European and regional elections were held concomitantly as municipal elections in 13 and 55 instances respectively. We also control for other elections that occurred in 11 cases when voters expressed preferences for local governments at the provincial level. The results show that the strongest determinant of voter turnout is the presence of the arguably most salient national elections, which significantly enhances voting for municipal offices by almost nine percentage points, while concomitant regional, European, and other elections are estimated to have no significant effect on turnout.

In column (2), we consider weather conditions on the election day - the dichotomous variable ‘rain’ taking on value 1 if the election day was wet, zero otherwise - as sole instrument for voter turnout. The results indicate that electoral participation is significantly higher - over three percentage points - in

\[ \text{Similar results can be obtained using rainfall in millimeters. The choice to use a dummy variable is motivated by the fact that information on rain is collected from different sources (see the data Appendix for details). While national sources provide normalized data, regional weather indicators are not, thus any data-merge would suffer from measurement errors. Moreover, one may argue that the intensity of rainfall has different effects in different areas of a country.} \]
rainy election days, a result in line with Knack’s (1994) finding of a positive association of cold election day temperatures and voter turnout. The election day weather dummy, though, has low explanatory power due to little variation in rainfall events in the sample, and is no longer significant in column (3), where the instrument matrix also includes the set of concurrent election dummies and the concomitant national election dummy retains a strong positive effect on turnout. As the summary statistics at the bottom of the table indicate, the instruments in column (3) are jointly significantly different from zero, and strong enough to foster confidence in the reliability of the second stage regressions (their partial R-squared is equal to 67%).

Estimates from the second-stage regression from the first-stage model in column (3) are in column (4) of table 4. The null hypothesis of the Hansen test of overidentifying restrictions that all the instruments are valid is not rejected, and the value of Kleinberger-Paap statistics that tests for weak identification indicates that the instruments are not weakly correlated with the endogenous turnout variable. Interestingly, and consistently with our model, voter turnout instrumented by the variables proxying the cost of voting is again estimated to have a negative and significant effect on performance, with a ten per cent increase in voter turnout being estimated to cause almost a 4 per cent fall in the city performance score.

4.1 Robustness checks

In table 5 we test the robustness of these findings by considering heterogeneity across Italian regions and year-specific nationwide influences on local elections if any. There are significant socio-economic differences across the regions of Italy. To account for this variation, the first four columns of table 5 report the results from specifications where we control for regional-level heterogeneity by computing cluster-robust standard errors and by including variables that are measured at the regional level and are arguably exogenous to voter turnout at the municipal level: the dependency ratio (i.e., the ratio of people not in the working age to the labour force) and a measure of the concentration of the population in big cities. Columns (1) and (2) report the results of the first stage and the second stage of a model that is run on the full sample of 77 municipalities. Estimation outcomes confirm that national concurrent elections are positively correlated with voter turnout in the first stage of our empirical model and that, once we control for endogeneity, voter turnout is negatively and significantly associated to city performance scores, and that this performance is

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10To 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 or cluster-robust standard errors (see Baum et al., 2007).
better in regions where there are more people living in the main cities.

Next we consider two sub-samples of Italian municipalities, defined on the basis of two criteria. In column (3) we exclude the Italian regions that are constitutionally entitled with broader autonomy (home rule regions), and in column (4) we consider only the regions in the Center-North of Italy, thus excluding the South and the islands.\textsuperscript{11} The results confirm that the exogenous component of voter turnout has a negative impact on city performance scores in both sub-samples and that in the Center-North of Italy city performance is lower in regions where the dependency ratio is higher.

In the last two columns of table 5, we consider the effect of year-specific factors such as nationwide influences on local elections or year-specific measurement issues in the Legambiente index of city performance scores. In the fixed-effects (FE) model we use, year effects would be highly correlated with the set of concurrent election dummies that we used as instruments so far. Indeed, in column (5) where time effects are included as control variables in both the first stage and the second stage, multicollinearity requires to drop the European elections dummy variable from the instruments’ set. The results show that our main finding of a negative and significant effect of instrumented electoral participation on policy outcomes is robust to this alternative specification. Time effects may also be used as excluded instruments instead of our vector of dummy variables for the occurrence of concomitant elections, although the economic nexus with voter turnout would become more difficult to interpret because time effects capture any year-specific influence. The results in column (6), where voter turnout is instrumented by time effects and weather conditions, show that our main finding of a negative and significant effect of instrumented electoral participation on policy outcomes is robust to this alternative specification.\textsuperscript{12}

\subsection*{4.2 Turnout and valence}

In this section we consider a number of indicators of valence of the mayors in order to test whether voter turnout has an effect on the quality of the candidates that are elected. The main difficulties in dealing with valence are to define which characteristics of the mayor are actually relevant and to find a good proxy for them. In this paper, we can exploit the information available on individual

\begin{itemize}
\item \textsuperscript{11}The Legambiente index of city performance is higher in the North and in the Center of Italy, where the average is above 0.50 in both cross-sections, than in the South and in the islands, where its average level does not rise above 0.45.
\item \textsuperscript{12}Results not reported indicate that our finding is also robust when we run IV-FE regressions on the larger sample that includes all the observations available for each municipality with the only condition that the length of office is at least two years - that is on an unbalanced panel structure including 70 municipalities recording two elections, and seven municipalities recording three elections.
\end{itemize}
characteristics such as profession, age, and education of the elected candidates provided by the Italian Ministry of Interior Affairs.

The first indicator of valence that we use reflects the professional experience and competence of the elected candidates. Information on occupation is quite detailed and we are able to identify various types of white-collars, entrepreneurs, teachers, engineers, servicemen, lawyers, scientists, doctors, directors, dealers, writers, retired. To build a measure of valence related to the profession of the mayor based the information we have, we follow a classification by the Italian Statistical Institute (ISTAT) which identifies a group of professions on the basis of the governance skills they allow to develop and then to apply. According to that classification, the level of competence needed to define and implement strategies at the policy, institutional and economic level is the one that can be acquired by people working at high levels of government bodies, public administration, judicial system, university, international organizations, public and private companies. This way of defining “high competence” fits well our purposes because it captures the level of knowledge required to perform tasks related to leading and managing public activities that is not always related to a specific levels of education or to expertise in general, that we will consider anyhow in what follows.

The estimation results are reported in table 8. The dependent variable in the first column of table 8, “profession,” is a dichotomous variable that takes value 1 if the mayor was employed in one of the above mentioned high-skill jobs, zero otherwise. To control for endogeneity of electoral participation, we use the vector of concurrent elections dummies and the weather (rainfall) indicator that appear as excluded instruments in the third column of table 3. The model we are going to estimate is a linear probability model with fixed locality and year effects. The IV estimation results in column (1) of table 6 indicate that turnout has a negative impact on the probability that “high professional status” mayors are elected, thus confirming that where participation is lower due to high costs of voting, it is more likely to elect a competent candidate. This finding holds in column (2), where we consider a more restrictive definition of profession-related valence that does not include entrepreneurs, who one may argue can have a conflict of interest as public administrators. The instruments, in this as in all the specifications in table 6, are statistically strong and exogenous in regressions that do not control for seniority anymore, the dependent variables being indicators of valence at the time of the election.

In the next column of table 6 we use information on mayors’ education. As

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13 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 (see the discussion in e.g. Angrist and Pischke, 2009).
briefly discussed above, education might not be a good proxy of the valence of the mayor, as the knowledge and skills acquired at the university do not necessarily resemble the ones needed to manage the potentially many and complex organizational challenges posed by a public administration. Moreover, the information provided by the Italian Ministry of Interior Affairs is much less detailed for education than for profession. We know if a mayor has a primary, secondary or undergraduate degree. But in our sample on Italian municipalities, where elected candidates hold a bachelor degree in 118 out of 154 elections, we have no information on the kind of programme they attended at the undergraduate level nor on any graduate or post-graduate course that might have attended. With such data at hand, we are able to build a variable, “high education”, that simply takes value 1 if the mayor has a bachelor degree, and zero otherwise. Finding no significant effect of instrumented turnout on the probability to elect a mayor who holds a bachelor degree is hence not surprising (results are in column (3) of table 6).

In column (4) of table 6, the variable “age at election” measures the age of the mayor at the time of the election. Information on age is difficult to relate to valence for the same reasons as education is. If on one hand one could argue that it proxies the level of expertise, on the other hand it is not necessarily general expertise what matters to governance. In our sample the age of the elected mayors at the date of appointment ranges between 30 and 74: 12 mayors were less than 40 years old, 51 aged between 40 and 49, 65 between 50 and 59, and 26 were 60 years old or more. Turning to the estimation outcomes, we detect no significant effect of voter turnout on this admittedly disputable proxy of valence.

In the last column of table 6, we test the last prediction of our theoretical model. Equation (7) shows that the win margin of the elected candidate is strictly increasing in the cost of voting when the cost of voting is above a threshold level. The "win margin" variable we use in column (5) is defined as the difference in votes between the winner candidate in the first round of the electoral context and the votes earned by the other candidates, divided by the number of votes gained by the winner (and multiplied by 100). In column (5) of table 6 the win margin is lower when electoral participation is higher, thus confirming the main prediction of the model, although not strongly so from a statistical point of view, its effect being imprecisely estimated (p-value of 0.121).

4.3 Pre-analysis plan

The empirical framework outlined in section 3 above will constitute the pre-analysis plan (Casey et al., 2012; Finkelstein et al., 2012) to be applied to the city performance data wave that will become available in December 2014. The analysis will be conducted along identical lines as the one presented above. All data referring to turnout rates in municipal elections, meteorological conditions
in the years 2002 to 2011, and the full set of control variables are available at the time of writing. The only unobserved variable is the key outcome variable represented by the vector of Italian cities’ performance scores in 2014. Such variable is based on measurement of the urban performance indicators in the years 2012-2013, and will be released at the end of year 2014.

Once the vector of performance scores will be available, the results of estimation of equation (11) on the new data will be displayed in table 7. Table 7 has an identical structure as table 3, and is therefore directly comparable to it. The same set of instruments, though observed at different times and only partially overlapping, is employed in the two estimates, namely: a) a vector of dummy variables for the presence of concomitant elections for the municipal elections held in the years 2002-2006 (first wave) and 2007-2011 (second wave); b) a dummy variable for rainfall on the municipal election day.

5 Concluding remarks

Being generally viewed as a symptom of democratic deficit and biased policy choices, low voter turnout tends to be a cause of widespread concern. This paper has addressed the question of whether low voter turnout rates in local elections might be deemed responsible for poor selection of candidates and weak performances of cities, and whether institutional remedies and voting/registration mechanisms aimed at raising voters’ participation in local elections should consequently be considered, also in the light of the growing socio-economic role of cities and its potential impact on people’s lives.

We have first built a model of voluntary and costly expressive voting, where the relative weight of ideology and valence issues over voting costs determines how people vote, and if they actually turn out to vote. The model indeed predicts, in line with the conventional rational calculus approach, that the cost of voting depresses voter turnout. However, it also shows that higher voting cost and low turnout elections tend to be characterized by an higher share of voters for whom the common value signal on candidates’ valence matches their private value views. This implies that higher voting costs can raise the chances of selecting higher valence candidates, and lead to the implementation of more successful policies.

We have tested the model on Italian municipalities’ election data, where we have exploited exogenous variation in voter turnout rates through the 2000s arising from two distinct sources. The first is the presence, that is typical of multi-tiered structures of government, of recurrent overlapping election cycles generating the possibility of concomitant elections for other levels of government (regional, national and European parliament elections) raising the stakes and reducing the cost of casting a vote for a second-order (municipal) election. The second is the long referred to, but relatively little systematically studied, turnout
effect of weather conditions (rainfall) on the election day. Measuring city performance by a unique indicator of urban environmental quality, and proxying mayors’ valence by variables reflecting their professional experience and competence, the instrumental variables estimation results consistently point to a negative causal impact of voter turnout rates on the performance of cities and on mayors’ valence indicators, and suggest that a switch from low to high voter turnout might not always be beneficial.

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Data Appendix

The sample compiled for the paper includes 77 municipalities for which we were able to collect data on all the variables relevant to our analysis in both cross-sections: electoral variables, city performance, weather conditions. Data on electoral outcomes and mayor’s characteristics in Italian municipalities are from the Ministry of Internal Affairs. The cities in the sample are the main municipalities (and administrative centers) in the province boroughs they belong to. Data refer to first-round election outcomes between 2001 and 2010. We consider two 5-year non overlapping cross-sections (2001-2005 and 2006-2010). If we observe more than one observation in a cross-section, due to an early break-up of the local government, we keep the more recent one. In the sample, elections took place every five years in 65 municipalities, while 12 municipalities went to the polls before the natural end of the term of office. The online archive of the Italian Ministry does not include complete data for elections in autonomous regions. Our sample includes Sardegna and Friuli - Venezia Giulia, and not Sicilia (where up to 2005 elections were held in the Fall and only thereafter in the Spring/early Summer as in the other regions), and the two bilingual regions Valle d’Aosta and Trentino Alto Adige. The ordinary region Calabria is not included due to its high political instability. Data on city performance are from Legambiente index of environmental quality. We use data of city performance from “Ecosistema Urbano 2004” and all its early publications up to “Ecosistema Urbano 2013”.

31
Figure 4
Figure 5
Table 1 Election and Legambiente data

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Turnout</th>
<th>Publication Year</th>
<th>Legambiente index</th>
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<td></td>
<td></td>
<td>mean</td>
<td>st.dev.</td>
<td>min</td>
</tr>
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</tr>
<tr>
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<td>2.73</td>
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<td>8</td>
<td>72.97</td>
<td>3.92</td>
<td>67.98</td>
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Table 2 Schedule of events

<table>
<thead>
<tr>
<th>elections*</th>
<th>First observation wave</th>
<th>Second observation wave</th>
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<tbody>
<tr>
<td>2001*</td>
<td>→ π2004</td>
<td>→ π2009</td>
</tr>
<tr>
<td>2002*</td>
<td>→ π2005</td>
<td>→ π2010</td>
</tr>
<tr>
<td>2003*</td>
<td>→ π2006</td>
<td>→ π2011</td>
</tr>
<tr>
<td>2004*</td>
<td>→ π2007</td>
<td>π2012</td>
</tr>
<tr>
<td>2005*</td>
<td>π2008</td>
<td>π2013</td>
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</table>

34
Table 3 Determinants of city performance, OLS estimation

<table>
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<td>Sample:</td>
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<td>Data in FD</td>
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<td>2006-10</td>
<td>2001-10</td>
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<td>Turnout</td>
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<td>-0.460**</td>
<td>-0.482***</td>
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<tr>
<td></td>
<td>(0.157)</td>
<td>(0.208)</td>
<td>(0.119)</td>
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<td>I year in the CS</td>
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<td>(2.516)</td>
<td>(2.618)</td>
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<td>(2.385)</td>
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<td>0.104</td>
<td>0.139</td>
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<tr>
<td>Observations</td>
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<td>77</td>
<td>154</td>
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Notes: Dependent variable: city performance score. Robust standard errors in parenthesis, (*) (**) (***) denote significance at the (10) (5) (1) percent level.
Table 4 Voter turnout and city performance, IV-FD estimation

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<td>voter turnout</td>
<td>voter turnout</td>
<td>city performance</td>
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<tr>
<td>National elections</td>
<td>8.848***</td>
<td>8.769***</td>
<td>(1.164)</td>
<td>(1.178)</td>
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<tr>
<td>European elections</td>
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<td>0.294</td>
<td>(1.541)</td>
<td>(1.534)</td>
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<td>Regional elections</td>
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<td>0.673</td>
<td>(0.967)</td>
<td>(0.948)</td>
</tr>
<tr>
<td>Other elections</td>
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<td>-5.870</td>
<td>(3.748)</td>
<td>(3.810)</td>
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<tr>
<td>Rain</td>
<td>3.365**</td>
<td>0.231</td>
<td>(1.298)</td>
<td>(0.648)</td>
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<td>Partial R-squared</td>
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<td>F statistic</td>
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<td>Hansen’s J statistic</td>
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<td>[0.00]</td>
<td>[0.429]</td>
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Notes: Estimation method: IV - first differences estimation. Robust standard errors in parenthesis. (*) (**) (***) denote significance at the (10) (5) (1) percent level. Statistics computed by the ivreg2 Stata module (Baum et al., 2007), definitions: Partial R-squared of excluded instruments; F statistic of the joint significance of the instruments, p-values in square brackets; Hansen’s J statistic of over-identifying restrictions, under the null that all the excluded instruments are valid instruments, Chi-squared p-values in square brackets; Kleibergen-Paap rk Wald F statistic of weak identification.
Table 5 Voter turnout and city performance: robustness checks

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<th>Regions:</th>
<th>1 (stage I)</th>
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<th>3 (stage II)</th>
<th>4 (stage II)</th>
<th>5 (stage II)</th>
<th>6 (stage II)</th>
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<td>(0.741)</td>
<td>(0.610)</td>
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<td>(0.247)</td>
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<tr>
<td></td>
<td>(1.891)</td>
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Notes: Estimation method: IV (first differences) estimation in columns (1) to (4); IV (within groups) estimation in columns (5) and (6). Robust standard errors in parenthesis are clustered by region; (*) (**) (***)) denote significance at the (10) (5) (1) percent level. Statistics computed by the ivreg2 Stata module (Baum et al., 2007), definitions: Partial R-squared of excluded instruments; F statistic of the joint significance of the instruments, p-values in square brackets; Hansen’s J statistic of over-identifying restrictions, under the null that all the excluded instruments are valid instruments, Chi-squared p-values in square brackets; Kleibergen-Paap rk Wald F statistic of weak identification.
<table>
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<th>(4)</th>
<th>(5)</th>
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<td>-0.017**</td>
<td>-0.009</td>
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<td>-0.017</td>
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<td>(0.009)</td>
<td>(0.029)</td>
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<td>16.81</td>
<td>16.81</td>
<td>16.81</td>
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<td>154</td>
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</table>

Notes: Estimation method: IV - first differences estimation. Robust standard errors in parenthesis, (*) (***) denote significance at the (10) (5) (1) percent level. Statistics computed by the ivreg2 Stata module (Baum et al., 2007), definitions: Hansen’s J statistic of over-identifying restrictions, under the null that all the excluded instruments are valid instruments, Chi-squared p-values in square brackets; Kleibergen-Paap rk Wald F statistic of weak identification.
## Pre-analysis plan section

Table 7 Voter turnout and city performance, IV-FD estimation

<table>
<thead>
<tr>
<th>(1) First stage</th>
<th>(2) First stage</th>
<th>(3) First stage</th>
<th>(4) Second stage</th>
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</thead>
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<td>voter turnout</td>
</tr>
<tr>
<td>Turnout</td>
<td>National elections</td>
<td>European elections</td>
<td>Regional elections</td>
</tr>
<tr>
<td>Rain</td>
<td>Partial R-squared</td>
<td>F statistic</td>
<td>Hansen’s J statistic</td>
</tr>
<tr>
<td>Observations</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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Appendix

Table A1 Descriptive statistics

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<th>std. dev.</th>
<th>min</th>
<th>max</th>
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<td>67.24</td>
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<td>46.99</td>
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<td>-1.02</td>
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