Policy Positions, Information Acquisition, and Turnout*

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ABSTRACT

The objective of this paper is to investigate the relationship between policy positions, information acquisition, and turnout. More specifically, we characterize the choice of acquiring political information and voting as a function of citizens' policy preferences. We conduct comparative static analysis on the information technology and we investigate the impact of a perceived polarization on information acquisition and turnout decisions.

We find that: (i) middle-of-the road citizens are the most likely both to acquire political information and to abstain; (ii) an increase in the effectiveness of information has a higher (positive) impact on turnout and on the fraction of the electorate who is informed than a comparable decrease in the cost of information; (iii) following a perceived polarization both information and abstention increase.

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I. Introduction

This paper investigates the relationship between policy positions, information acquisition, and turnout. In a context with incomplete or asymmetric political information, electoral outcomes may fail to reflect the interest of a majority of citizens.[1] Also, political information as well as turnout and voting decisions are likely to depend on underlying heterogeneous policy preferences. Therefore, the understanding of who decides to acquire political information and to vote, as well as how political information affects voting choices, is a major but still unexplained issue.

In this respect, traditional rational choice theories of turnout based on the *calculus of voting equation*, lead to the so called "rational ignorance hypothesis" and "paradox of voting."[2] That is, when the probability an individual vote affects the electoral outcome is negligible and voting is costly, citizens may rationally decide to remain uninformed and to abstain.[3] The failure to explain information acquisition is pervasive also in the two prominent theories of turnout in the context of spatial models of voting, namely *abstention by indifference* and *abstention by alienation.*[4] Feddersen and Sandroni (2004) incorporate costly information acquisition in an ethical-voter model. However, they do not investigate the effect of heterogeneous policy preferences on information acquisition and turnout. Matsusaka (1995) proposes a model of turnout with endogenous information where the direct benefit from voting exogenously depends on the level of confidence on the vote choice. However, he does not model where this confidence comes from nor how it is related to citizens' political preferences and candidates' policy stands.

The analysis of this paper builds on the theory of turnout and voting of Degan and Merlo (2006).[5] We consider one election with two candidates. Each candidate is characterized

[1] See, e.g, Taylor and Yildirim (2005), Degan (2004), and Feddersen and Sandroni (2004).

[2] See, e.g., Downs (1957), Ricker and Ordeshook (1968), and Palfrey and Rosenthal (1983;1985).

[3] Martinelli (2005) endogenizes costly information acquisition in a pivotal-voter model but he abstracts from abstention.

[4] See, e.g., Hinich and Ordeshook (1969) and Enelow and Hinich (1984).

[5] In Degan and Merlo (2006) information is exogenous and the theoretical relation between policy positions

by a position on a one-dimensional liberal-conservative policy space. Citizens are ex-ante uninformed about the candidates' positions and share a common prior on their joint distribution.[6] While citizens derive exogenous direct benefits from voting (sense of civic duty), they experience an endogenous cost of voting, which is derived from the possibility of voting for the wrong candidate. In order to reduce the potential cost of voting, each citizen can decide to invest in information at a fixed cost. In that case, he will become informed about the candidates' policy positions with a given probability (effectiveness of information).

We characterize information acquisition and turnout choices as a function of citizens' policy preferences given their sense of civic duty and the cost of information. We find that *partisans* -who for any given civic duty have relatively low cost of voting- always vote. Among these, *strong partisans* do not acquire information; while *weak partisans* acquire information. In addition, *middle-of-the road citizens* -who for any given civic duty have relatively high cost of voting- acquire information when it is not too costly, and abstain whenever they remain ex-post uninformed. Overall, *middle-of-the road citizens* are the most likely to both acquire political information and to abstain. Also, their voting choices are the most likely to be affected by the knowledge of candidates' policy positions.

In our model, contrary to existing models of voting, the sense of civic duty, may not only affect turnout decisions but, through its effect on the decision to acquire political information, it may also affect citizens' voting choices. In addition, as long as information is costly or imperfect, the different incentives to reduce the cost of voting for citizens with different ideal points endogenously generate asymmetric information. As a consequence, electoral outcomes may not reflect the interest of a majority of citizens.

Comparative statics analysis indicates that decreasing the effective cost of information (cost/effectiveness) positively affects turnout and the proportion of voters who acquire information. However, an increase in the effectiveness of information leads to a higher turnout

and turnout is not investigated.

[6] Alvarez (1997) investigates the impact of voters' uncertainty about candidates' policy positions on voting decisions. He abstracts from abstention and does not explicitly propose a theory of information acquisition.

and more informed voters than a comparable decrease in the cost of information. Furthermore, we investigate the effect of a perceived polarization. We find that the proportion of citizens investing in political information increases and, part of the citizens who previously voted even if uninformed now abstain.

The organization of the paper is as follows. Section II describes the model. Section III characterizes the relationship between policy positions, cost of voting and turnout. Section IV contains comparative static analysis on the information technology. Section V discusses the effect of a perceived polarization of candidates' positions; and, in Section VI concludes.

II. The Model

We consider one election with two candidates, a democratic candidate, D, and a republican candidate R. We assume that each candidate $c \in \{D, R\}$ is characterized by a policy position y_c belonging to $Y_c \subseteq Y \subset R$, where Y is the liberal-conservative policy space. There is a continuum of citizens. We denote by N the set of citizens and by $j \in N$ a generic citizen. Each citizen j has a preferred policy position, or ideal point, $y_j \in Y$, and evaluates candidate $c \in \{D, R\}$, conditional on his policy position $y_c \in Y$, according to the payoff function:[7]

$$u_j^c = -(y_j - y_c)^2.$$

Citizens ex-ante do not observe the policy positions of the two running candidates (y_D, y_R), which from their perspective are random variables $(\widetilde{y_D}, \widetilde{y_R})$ distributed according to the joint prior distribution F on $Y_D \times Y_R$. We make the realistic assumption that the position of the democratic candidate is never more conservative than the one of the republican, that is, $f(y_D, y_R) = 0 \ \forall y_D > y_R$. In addition, without loss of generality, we assume that F is symmetric around zero and that $Y_D = [-b, -a]$ and $Y_R = [a, b]$, where $\infty > b > 0$, $-\infty < a < b$.[8]

[7] For section II-IV, similar results hold for more general single-peaked payoff functions of the form $u_j^c = -|y_j - y_c|^\beta$, $\beta \geq 1$. However, the results in section V require "risk-aversion", that is $\beta > 1$.

[8] This specification, consistent with what we observe in U.S Congress, allows, but does not require, overlapping support of the policy positions of the two parties' candidates.

Each citizen can invest in information at a cost $\delta > 0$. We let i_j be a dummy variable equal to 1 when citizen j invests in information and 0 otherwise. A citizen who invests in information will be successful and observe the two candidates' actual policy positions, (y_D, y_R), with probability $p \in (0, 1]$ and will be unsuccessful and remain uninformed with probability $(1 - p)$. We let $\Omega_j \in \Omega = \{F, (y_D, y_R)\}$ denote citizen j's information set. These stylized assumptions on the information technology capture the idea, consistent with the dominant view of the political cognition literature, that citizens' information come from the costly collection and elaboration of disperse pieces of information.[9] The success in collecting and elaborating information will depend on the coherence of the pieces of information and on the cognitive abilities of individuals. The cost of acquiring information can be viewed as the cost of time spent watching political debates, searching for political information on newspapers or TV (decreasing in the coverage of politics by the media), or the cognitive cost of elaborating disaggregated information.

As in Degan and Merlo (2006), central to the analysis is the assumption that citizens derive a cost when they vote for a candidate who may not be the preferred one. In particular, the *cost of voting for* candidate D is defined as the expected payoff loss generated by the possibility of voting erroneously for that candidate:

$$c_j(D) = E\left[1\left\{u_j^D < u_j^R\right\} \cdot \left(u_j^R - u_j^D\right) |\Omega_j\right],$$

where the expectation is taken with respect to the distribution of candidates' positions corresponding to the information set Ω_j and $1\{.\}$ is an indicator function taking the value of 1 when the expression inside the brackets is correct.[10] The cost of voting for candidate R is defined analogously. While uninformed citizens, due to their uncertainty about candidates' positions, may derive a positive cost of voting for any candidate, informed citizens, by definition, can always choose to vote for a candidate delivering a zero cost of voting.

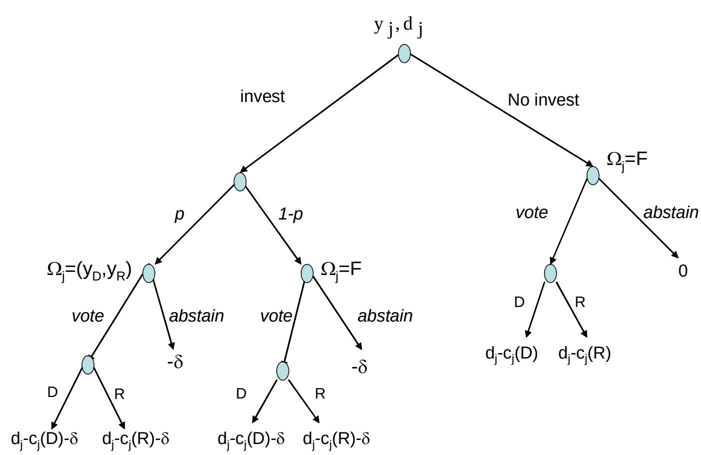
[9] See McGraw 2000 for a review of the cognitive approach in political psychology.

[10] We use $c_j(D)$ as a shortcut for the function $c(D, y_j; \Omega_j)$.

Each citizen also has an exogenous direct benefit of voting $d_j \geqslant 0$, which can be interpreted as the benefit of fulfilling one's civic duty.[11] For the purpose of our analysis we do not need to specify the distribution of civic duty. This could be degenerate or could be related to policy views as well as be affected by other factors, such as, for example, social norms. However, it is assumed not to depend on political information.

Citizen j's problem can be viewed as a three-stage problem (see Figure 1), where in the first stage he decides whether to invest in information; in the second stage, given his information set, he decides whether to vote or abstain; and in the third stage he decides who to vote for. At the end, he derives a net benefit of voting (not voting) of $t_j(d_j - c(v_j)) - \delta \cdot i_j$, where $t_j \in \{0, 1\}$ is a dummy variable equal to 1 if the citizen decides to turnout to vote and $v_j \in \{D, R\}$ is his voting choice. In the next section we describe the solution to the problem of a generic citizen j as well as the main implications of the model.

Figure 1



III. Results

The solution to citizen j's optimization problem is found by solving the model backward. In the last stage, each citizen has to decide, conditional on voting and on his information set, who to vote for in order to maximize the net benefit of voting. It follows that citizen

[11] See, e.g, Downs(1957), Ricker and Ordeshook (1968), Matsusaka (1995), and Coate and Conlin (2004).

j's optimal voting rule is to vote for the alternative generating the smallest cost of voting.[12] The optimal voting rule also implies, the following proposition, which delivers a tractable expression for the optimal voting choice, v_j^*.[13]

Proposition 1: *Given the information set $\Omega_j \in \Omega$, conditional on voting: (a) Maximizing the net benefit of voting is equivalent to voting sincerely, that is voting for the candidate who generates the highest expected relative payoff. Formally, $v_j^* = D$ iff $E[u_j^D - u_j^R|\Omega_j] > 0$ and $v_j^* = R$ iff $E[u_j^D - u_j^R|\Omega_j] < 0$. (b) The optimal voting rule is a cutoff rule with cutoff $\tau(\Omega_j) = \frac{E\left[(y_R^2 - y_D^2)|\Omega_j\right]}{2E[(y_R - y_D)|\Omega_j]}$. In particular, when $\Omega_j = (y_D, y_R)$, the cutoff is the midpoint between the two candidates' positions ($\tau(\Omega_j) = \frac{y_D + y_R}{2}$) and when $\Omega_j = F$, the cutoff is zero.*

The *cost of voting,* $c_j(v_j^*)$, is defined as the cost of voting for the candidate prescribed by the optimal voting rule. This cost is therefore endogenous, as it depends on the specific voting decision, which in turns is affected by the choice of acquiring information.

Given, v_j^*, working back one stage, citizen j's optimal turnout choice is to participate ($t_j^* = 1$) if $c_j(v_j^*) \leq d_j$ and to abstain ($t_j^* = 0$) otherwise. In the first stage each citizen j optimally chooses whether to invest, i_j^*, so as to maximize his expected net benefits from voting taking into consideration his future optimal turnout and voting decisions conditional on each information set $\Omega_j \in \Omega$. Since, the cost of voting for an ex-post informed citizen, who observes (y_D, y_R), is zero, in what follows we denote by c_j^* the cost of voting of citizen j when $\Omega_j = F$.

Proposition 2: *Given the prior F, take a generic citizen j with policy position $y_j \in Y$ and civic duty $d_j \geq 0$. (1) When $\frac{\delta}{p} \leq d_j$: (a) if $c_j^* > d_j$ citizen j invests in information ($i_j^* = 1$). In addition, if j becomes informed he will vote according to v_j^* otherwise he will abstain (b) if $\frac{\delta}{p} \leq c_j^* \leq d_j$ citizen j invests in information and, conditional on his information set, he will vote according to v_j^*; (c) if $c_j^* < \frac{\delta}{p}$ citizen j does not invest in information ($i_j^* = 0$)*

[12] For simplicity thourough the paper we abstract from ties. Implicitly, when the citizen is indifferent among different options he randomizes among them with equal probability.

[13] With abuse of notation, we refer to v_j^* as to the optimal voting choice of individual j with policy position y_j and information set Ω_j.

and he votes according to v_j^*. (2) When $\frac{\delta}{p} > d_j$ citizen j does not invest in information. In addition: (a) if $c_j^* > d_j$ he will abstain; and (b) if $c_j^* \leq d_j$ he will vote according to v_j^*.

Figure 2: $\frac{\delta}{p} \leq d_j$ (CASE 1)

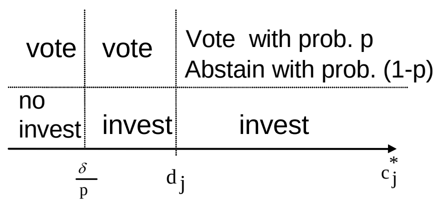
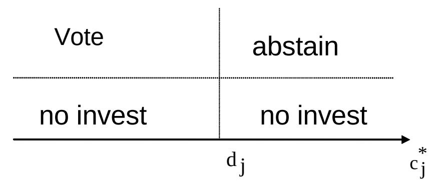


Figure 3: $\frac{\delta}{p} > d_j$ (CASE 2)



To understand the results of proposition 2, which are illustrated graphically in Figures 2 and 3, notice that while an informed voter always find it optimal to vote, an uninformed voter finds it optimal to abstain if $d_j - c_j^* < 0$. The optimal investment decision as a function of the cost of voting c_j^* depends on the value of civic duty relative to the effective cost of information. Consider first the case where $d_j \geq \frac{\delta}{p}$. When $c_j^* > d_j$, an individual who does not invest in information finds it optimal to abstain and obtains a zero payoff. Therefore, the individual will acquire information if $d_j p - \delta \geq 0$, that is, when $\frac{\delta}{p} \leq d_j$, and he will not acquire information otherwise. When $c_j^* \leq d_j$ an individual who does not invest in information finds it optimal to vote and obtains a payoff of $d_j - c_j^*$. It follows that the individual will acquire information if $d_j - c_j^* \cdot (1-p) - \delta \geq d_j - c_j^*$, i.e. $c_j^* \geq \frac{\delta}{p}$, and he will not acquire information if $c_j^* < \frac{\delta}{p}$. Consider now the case where $d_j < \frac{\delta}{p}$. Citizen j will never invest in information because $d_j - \frac{\delta}{p} < 0$. In addition, when $c_j^* > d_j$, he will abstain and when $c_j^* < d_j$, he will always vote, independent of his information. To relate the optimal investment decision to citizens' policy positions we need to characterize the cost of voting c_j^* as a function of y_j.

Proposition 2: *The cost of voting c_j^*, is single peaked at 0 for all values of y_j s.t. $|y_j| > \frac{b-a}{2}$ and $c_j^* = 0 \ \forall \ |y_j| \geq \frac{b-a}{2}$.*

For any $x \in (0, \overline{C}]$, $\overline{C} = \max_j c_j^*$, let $l(x) \in Y^-$ and $r(x) \in Y^+$ be the points on the policy space satisfying $c_k^* = x$, $k \in N$ such that $y_k \in \{l(x), r(x)\}$. We denote by $N^P = \{k : y_k \in Y \backslash [l(d_k), r(d_k)]\}$ the set of *partisans* and by $N^M = \{k : y_k \in [l(d_k), r(d_k)]\}$

the set of *middle-of-the-road* citizens. In addition, among *partisans*, we let $N^W = \{k : y_k \in [l(\frac{\delta}{p}), l(d_k)] \cup [r(d_k), r(\frac{\delta}{p})], d_k > \frac{\delta}{p}\}$ be the set of *weak partisans*, and $N^{SP} = N^P \backslash N^W$ the set of *strong partisans*. Similarly, we let $N_d^K = \{k : y_k \in N^K, d_k = d\}$, $K = P, M, W, SP$, be the set of individuals with policy positions in the intervals implicitly defined by N^K when $d_k = d$.[14]

The following proposition, which is at the center of our analysis, characterizes the optimal investment and turnout choices of citizen j as a function of his policy position y_j for any given value of his sense of civic duty d_j relative to the effective cost of information, δ/p.[15]

Proposition 3: *Given the prior F, take a generic citizen j with policy position $y_j \in Y$ and civic duty $d_j = d \geq 0$.* (a) *When $j \in N_d^P$ then citizen j goes to vote. (b) When $d_j \geq \frac{\delta}{p}$: if $j \in N_d^{SP}$ the citizen does not invest in information; if $j \in N^W$* or *$j \in N_d^M$ the citizen invests in information. In addition, when he remains uninformed he will abstains while when he becomes informed he will go to vote. (c) When $d_j < \frac{\delta}{p}$: the citizen does not invest in information. In addition, when $j \in N_d^W$ he abstains.*

Proposition 3 is a straightforward implication of proposition 2 and the optimal investment decision described above. Figures 4 and 5 illustrate proposition 3, given the result of proposition 2, in the particular cases where civic duty is constant in the population and is higher and lower than the effective cost of information, respectively.

[14] The definitions of these categories of citizens are not related to the concept of "party affiliation." They depend, given the cost of information, on citizens' policy positions and civic duties only. For simplicity, our notation does not take into consideration the following extreme cases: $d > \overline{C}$ and $\frac{\delta}{p} > \overline{C}$. In these cases, the points $(l(d), r(d))$ and $(l(\frac{\delta}{p}), r(\frac{\delta}{p}))$ do not exists, respectively. In the first case N_d^P coincides with the sets of voters with civic duty d and ideal points in Y. In the second case $N^W = \emptyset$.

[15] As tie breaking rule we assume that, when a citizen is indifferent between investing and not investing in information, he invests. Similarly, when a citizen is indifferent between voting and abstaining, he votes. Nevertheless, none of these assumptions are important for our main results.

Figure 5: $\frac{\delta}{p} \leq d$

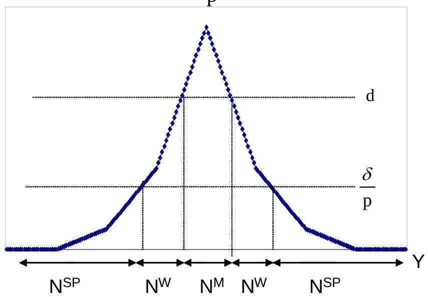
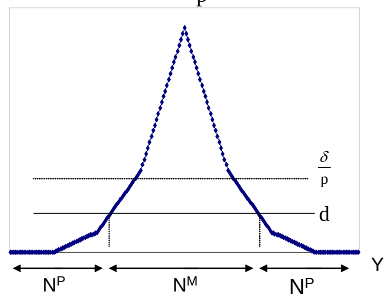


Figure 6: $\frac{\delta}{p} > d$



In words, proposition 3 states that *partisans* -who, for any given civic duty, have relatively low cost of voting- always vote. Among these, *strong partisans* -who have the lowest cost of voting- do not acquire information; but *weak partisans* -who have intermediate cost of voting and relatively high civic duty- acquire information . Finally, *middle-of-the-road* citizens -who, for any given civic duty, have relatively high cost of voting- acquire information when it is not too costly, and abstain whenever they remain ex-post uninformed.

The following four observations are in order. First, there are citizens, *weak partisans*, who decide to invest in costly information even if their turnout choice is not affected by the information they eventually obtain.[16] Second, citizens with middle-of-the-road positions with respect to the prior F, are the most likely to acquire political information and to abstain. In addition, their voting choices are the most likely to be affected by the knowledge of the candidates' policy positions. This suggests that, as many models with swing voters exogenously assume, middle-of-the-road citizens could be an optimal target of candidates' political campaigns.[17] Third, our results indicate that the sense of civic duty, may not only affect turnout decisions but, through its effect on the decision to acquire political information, it may also affect citizens' voting choices. In our context, as long as information is costly or imperfect, the different incentives to reduce the cost of voting for citizens with different ideal points endogenously generate asymmetric information. As a consequence, electoral outcomes

[16] However, information may affect their voting choices.

[17] The endogenization of candidates' political campaigns is however beyond the scope of this paper.

may not reflect the interest of a majority of citizens.[18]

Example 1

We propose an example to illustrate how to derive the cost of voting c_j^*. We then use the same example to show that the outcome of the election may not be the alternative preferred by the median voter in the hypothetical situation in which all voters know the two candidates' policy positions.

Let $Y = [-1, 1]$ and the support of the policy positions of the two candidates be $Y_D = \left\{-1, -\frac{1}{2}, 0, \frac{1}{2}\right\}$ and $Y_R = \left\{-\frac{1}{2}, 0, \frac{1}{2}, 1\right\}$. Assume that the prior F is uniform on the support $Y_{DR} = \{(y_D, y_R) \in Y_D \times Y_R | y_D < y_R\}$, that is $p(y_D, y_R) = 1/10\ \forall (y_D, y_R) \in Y_{DR}$, where $p(\cdot)$ is the probability density function corresponding to F.

To calculate the cost of voting of uninformed citizens note that, for each realization of candidates' policies (y_D, y_R), we can determine whether a citizen would be voting for the wrong candidate if he were to vote (according to the optimal voting rule) and calculate the corresponding cost. If $(y_D, y_R) = \left(-1, -\frac{1}{2}\right)$, only citizens with $-\frac{3}{4} < y_j < 0$ would make a voting mistake (since they would vote for D but should instead vote for R, as they would do if they were informed). The associated cost would be equal to $u_j^D - u_j^R = (-\frac{1}{2} - y_j)^2 + (-1 - y_j)^2 = 3/4 + y_j$. If $(y_D, y_R) = (-1, 0)$ only citizens with $-1/2 < y_j < 0$ would incur a cost of voting (for the same reason as above) of magnitude $1 + 2y_j$. The calculations of the cost of voting for the remaining possible realizations is analogous. The cost of voting as a function of y_j is obtained by summing over the costs experienced by j in correspondence of each realization (y_D, y_R) weighted by the associated prior probability.

$$c_j^* = \begin{cases} 0 & y_j \in [-1, -\frac{3}{4}] \cup [\frac{3}{4}, 1] \\ \frac{3-4|y_j|}{40} & y_j \in [-\frac{3}{4}, -\frac{1}{2}] \cup [\frac{1}{2}, \frac{3}{4}] \\ \frac{7-12|y_j|}{40} & y_j \in [-\frac{1}{2}, -\frac{1}{4}] \cup [\frac{1}{4}, \frac{1}{2}] \\ \frac{11-28|y_j|}{40} & y_j \in [-\frac{1}{4}, \frac{1}{4}] \end{cases}$$

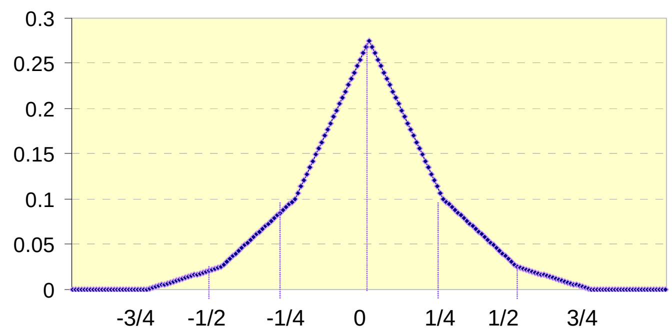
We illustrate the cost of voting so derived graphically in Figure 7.[19] When $y_j \leq -\frac{3}{4}$ it

[18] Recall that we haven't imposed any restriction on the distribution of citizen's ideal points.

[19] The analytical derivation of the expected regret from voting is straight forward. Notice that the points in

is always optimal for the voter to vote for the democratic candidate and, therefore, he never experiences a cost (see proposition 3). When $-\frac{3}{4} < y_j \leq -\frac{1}{2}$ he suffer a cost of voting in correspondence of policies $(-1, -\frac{1}{2})$ because he votes for D but since $y_j > \frac{-1-\frac{1}{2}}{2} = -\frac{3}{4}$, he would have preferred to vote for R. For the same reason, when $-\frac{1}{2} < y_j \leq -\frac{1}{4}$ he suffer a cost in correspondence of policies $(-1, -\frac{1}{2})$, and $(-1, 0)$. When $-\frac{3}{4} < y_j \leq 0$ he suffers a cost in correspondence of policies $(-1, -\frac{1}{2})$, $(-1, 0), (-1, \frac{1}{2})$, and $(-\frac{1}{2}, 0)$. The analogous holds for the remaining intervals.

Figure 7: example of cost of voting



Assume now that everybody in the population has the same civic duty, $d_j = d = 0.1875, \forall j$, and that the effective cost of information is $\frac{\delta}{p} = 0.1$, where $\delta = 0.02$ and $p = 0.2$. To make statements about the median voter and electoral outcomes we need to specify the distribution of citizens' policy positions. Assume that they are distributed along the policy space Y according to the following piecewise uniform density function:

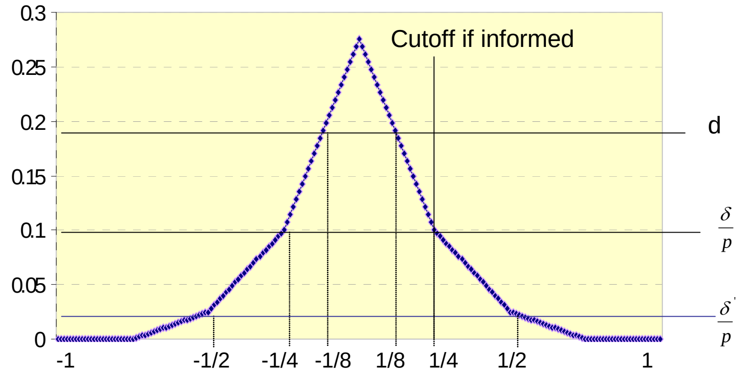
$$f_y(y) = \begin{cases} \frac{1}{6} & y \in [-1, -\frac{1}{2}] \quad \textit{group } a \\ \frac{4}{6} & y \in [-\frac{1}{2}, 0] \quad \textit{group } b \\ 1 & y \in [0, \frac{1}{2}] \quad \textit{group } c \\ \frac{1}{6} & y \in [\frac{1}{2}, 1] \quad \textit{group } d \end{cases}.$$

Consider the case where the actual, but unobserved, candidates' positions are $(y_D, y_R) = (-\frac{1}{2}, 1)$, which implies a cutoff for uninformed citizens of $+\frac{1}{4}$. A majority of citizens, if informed would prefer D. In fact, the median voter is $y = 1/12 < \frac{1}{4}$. We now calculate the

correspondence of which the regret function changes slope are defined by the cutoff points of informed citizens.

mass of votes received by candidate D and R, respectively. Figure 8 helps to understand the calculation.

Figure 8



The votes received by candidate D can be decomposed into the following groups: *(a)* all citizens in *group a*, plus 2/4 of citizens in *group b*, $y \in [-\frac{1}{2}, -\frac{1}{4}]$, who do not acquire information and always vote for D, with mass $\frac{1}{12}$ and $\frac{2}{4} \cdot \frac{4}{12}$, respectively; *(b)*1/4 of citizens *in group b*, $y \in [-\frac{1}{4}, -\frac{1}{8}]$, who acquire information and, when $(y_D, y_R) = (-\frac{1}{2}, 1)$, always vote for D, with mass $\frac{1}{4} \cdot \frac{4}{12}$; *(c)* 1/4 of citizens in *group b*, $y \in [-\frac{1}{8}, 0]$, who acquire information and vote (in this case) for D only if they become informed (otherwise they abstain), with mass $\frac{1}{4} \cdot \frac{4}{12} \cdot p$; *(d)* 1/4 of citizens in *group c*, $y \in [0, \frac{1}{8}]$, who acquire information and vote (in this case) for D only if they become informed (otherwise they abstain), with mass $\frac{1}{4} \cdot \frac{6}{12} \cdot p$; *(d)* 1/4 of citizens in *group c*, $y \in [\frac{1}{8}, \frac{1}{4}]$, who acquire information and vote (in this case) for D only if they become informed (otherwise they vote R), with mass $\frac{1}{4} \cdot \frac{6}{12} \cdot p$. The resulting total mass of votes for D is: $\frac{1}{3} + \frac{1}{3}p$.

Similarly, the mass of votes received by candidate R can be decomposed into the following groups: *(a)* 1/4 of citizens in *group c*, $y \in [\frac{1}{8}, \frac{1}{4}]$, who acquire information and vote (in this case) for R only if they remain uninformed, with mass $\frac{1}{4} \cdot \frac{6}{12} \cdot (1-p)$; *(b)* all citizens in *group d*, plus 2/4 of citizens in *group b*, $y \in [\frac{1}{4}, \frac{1}{2}]$, who do not acquire information and always vote for R, with mass $\frac{1}{12}$ and $\frac{2}{4} \cdot \frac{6}{12}$, respectively. The total mass of votes for R is: $\frac{1}{3} + \frac{1}{8}(1-p)$ and the total mass of abstainers is $\frac{5}{24}(1-p)$.

The above calculations imply that when $p = 0.2$, candidate D receives a mass of votes equal to $\frac{12}{30}$ and candidate R receives $\frac{13}{30}$ (a mass of $\frac{1}{6}$ abstains). That is, R wins even if D is preferred by a majority of citizens.

IV. Comparative statics analysis

We turn to the effect of δ and p on information acquisition and turnout for any given distribution of ideal points and civic duties. Starting from a situation where $\frac{\delta}{p} < \overline{C}$, holding the change in the effective cost of information $\Delta\frac{\delta}{p}$ constant, we consider an increase in δ and an equivalent reduction of p, respectively.[20] Notice that an increase in $\frac{\delta}{p}$ affects only those citizens with $d_j \geq \frac{\delta}{p}$. The results of the comparative statics are a straightforward application of proposition 3 and can be summarized in the following proposition.

Proposition 4: *When the cost of information δ* increases, *among citizens with $d_j \geq \frac{\delta}{p}$, we have less investment in information, more uninformed voters and more abstainers. An equivalent decrease in p, has the additional effect of raising further (among citizens with $d_j > \frac{\delta}{p} + \Delta\frac{\delta}{p}$) the mass of abstainers as well as the mass of both uninformed citizens and uninformed voters.*

When $\frac{\delta}{p} \leq d_j < \frac{\delta}{p} + \Delta\frac{\delta}{p}$, the set of *weak partisans* becomes empty and *middle-of-the-road citizens,* who were initially investing and voting if successful, do not invest and abstain. When $d_j \geq \frac{\delta}{p} + \Delta\frac{\delta}{p}$ the set of *strong partisans,* who always vote and never invest, becomes larger. Correspondingly, the set of *weak partisans* is reduced by the same size. The additional abstention and the lower information, due to an equivalent decrease in the effectiveness of information, comes from the fact that investors now remain uninformed with a higher probability.

These results suggest that increasing the effectiveness of information (for example by increasing the level of education in the population or by improving the coherence of campaign advertising) not only mobilizes more voters than just decreasing the cost of gathering

[20] The situation where $\frac{\delta}{p} \geq \overline{C}$ is uninteresting, as nobody ever invests.

information (for example, by increasing the amount of political advertising), but it also leads to a more informed electorate. In addition, the two ways of reducing the effective cost of information may have different impacts on electoral outcomes.

Example 2

Consider the setting of example 1. Assume now that the cost of information increases and becomes $\delta' = 0.05$, implying an effective cost of information of 0.025 (see Figure 8). Calculations analogous to the ones in example 1 show that, as before, the mass of votes for D and for R is $\frac{12}{30}$ and $\frac{13}{30}$, respectively. In this particular case, the mass of informed increases but the mass of abstainers does not change, Also, under the particular realization considered, the electoral outcome (winner and vote share) remains exactly the same. This is because the voting behavior of the additional citizens who invest in information is not affected (with respect to example 1) by the information received when $(y_D, y_R) = (-\frac{1}{2}, 1)$.

Consider now an equivalent increase in the effective cost of information (fixed at 0.025) which is partially due to an increase in the effectiveness in information p. For example, assume that $p' = 0.5$. Now, while the mass of abstainers, as before, does not change, the mass of informed increases further. The mass of votes for D is $\frac{1}{3} + \frac{1}{3}p' = \frac{120}{240} =$ and the mass of votes for R is $\frac{1}{3} + \frac{1}{8}(1 - p') = \frac{95}{240}$ (the mass of abstainers is $\frac{5}{24}(1 - p') = \frac{25}{240}$). Now the electoral outcome is the one preferred by the median voter (D).

V. Polarization

We consider a perceived polarization of candidates' positions, where the definition of polarization is as follows:

Definition 1: *The prior F', defined on $Y'_D \times Y'_R$, $(Y'_D, Y'_R \subset Y)$ is a polarization with respect to F iff* $\exists \Delta > 0$ s.t.: *(a)* $\forall (y_D, y_R) \in Y_D \times Y_R \rightarrow (y_D - \Delta, y_R + \Delta) \in Y'_D \times Y'_R$ and *(b)* $f'(y_D - \Delta, y_R + \Delta) = f(y_D, y_R), \forall (y_D, y_R) \in Y_D \times Y_R$.

The distribution F' is symmetric around zero and the midpoints corresponding to the possible realizations of the candidates' policy positions as well as their corresponding probabilities are unaffected by a polarization.

Proposition 5: *For any given* F*, if* F' *is a polarization with respect to* F *then,* $\forall j \in N$*,* $c_j'^* > c_j^*$ *if* $|y_j| < \frac{b-a}{2}$*, and* $c_j'^* = c_j^* = 0$ *if* $|y_j| \geq \frac{b-a}{2}$*, where* $c_j'^*$ *and* c_j^* *are the costs of voting of uninformed citizen* j *under the prior* F'*and* F*, respectively.*

Intuitively, following a polarization the probability of making voting mistakes does not change but the associated cost, due to the strict concavity of the payoff function, increases. We concentrate on the case where $\frac{\delta}{p} < \overline{C}$, so that before a polarization there is some scope for investing in information, and we combine the results of proposition 3 and 5 in the following proposition 6.

Proposition 6: *A perceived polarization generates more informed citizens and/or higher abstention.*

The fact that $c_j'^* \geq c_j^*$ implies that among citizens with $d_j \geq \frac{\delta}{p}$: *(a)* the set of *strong partisans*, who always vote without acquiring information, shrinks; *(b)* the set of citizens who acquire information ($N^W \cup N^M$) expands by the same size and *(c)* the set of *middle-of-the-road* citizens, who invest but would eventually abstain if unsuccessful expands as well. Similarly, among citizens with $d_j < \frac{\delta}{p}$, the set of *middle-of-the-road* citizens who abstain increases.

Example 3

To see the effect of a polarization consider the simple example where the support of the two candidates' policy position is disjoint. In particular, let $Y_D = \left\{-\frac{3}{4}, -\frac{1}{2}, -\frac{1}{4}, 0\right\}$ and $Y_R = \left\{0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}\right\}$. Assume that the initial prior F is uniform on the support $Y_{DR} = \{(y_D, y_R) \in Y_D \times Y_R\}$, that is $p(y_D, y_R) = 1/16$, $\forall (y_D, y_R) \in Y_{DR}$. Consider now a polarization. In particular let F' be defined on $Y'_{DR} = \{(y_D, y_R) \in Y'_D \times Y'_R\}$, where $Y'_D = \left\{-1, -\frac{3}{4}, -\frac{1}{2}, -\frac{1}{4}\right\}$ and $Y'_R = \left\{\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1\right\}$ and $p'(y'_D, y'_R) = 1/16$, $\forall (y'_D, y'_R) \in Y'_{DR}$. Figures 9 and 10 illustrate the situation and provide a graphical intuition for the results of proposition 6.

Figure 9: change in N^W following a polarization

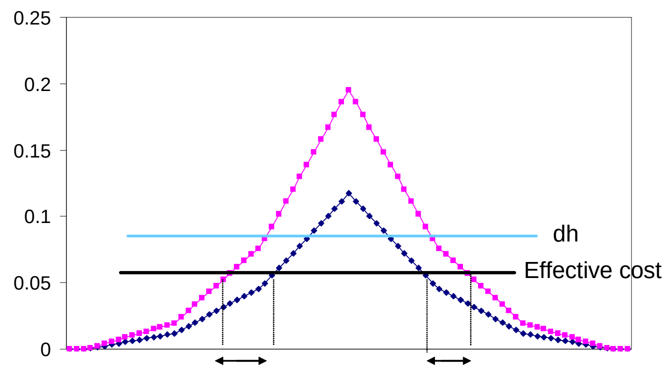
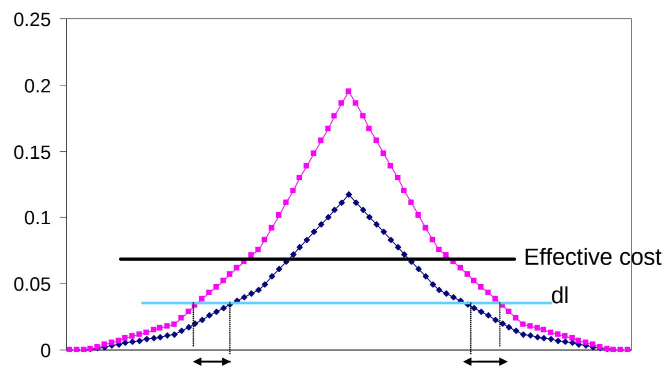


Figure 10: change in N^P following a polarization



VI. Conclusions

In this paper, we have analyzed the relationship between policy positions, information acquisition and turnout using the setup of Degan and Merlo (2006). Our analysis points out the importance of the whole distribution of perceived positions of running candidates as well as both the cost and the quality of information. Our findings can be compared to the implications of two prominent theories of turnout in spatial models of voting, namely *abstention by indifference* and *abstention by alienation.* According to the theory of abstention by indifference, citizens will abstain when they do not perceive significant differences among the two candidates and voting is costly. According to the theory of abstention by alienation, a citizen abstains when none of the candidates has a policy position close enough to his ideal point to induce him to turn out and vote for him. Contrary to our model, these two theories are silent with respect to citizens' incentives to gather political information.[21] For what concerns voting, as in our model, both theories predict that, conditional on voting and on information, a citizen votes for the candidate whose policy position is, on expectation, the closest to his preferred policy.

Turning to abstention, the theory of abstention by indifference predicts that middle-of-the-road citizens are the ones who abstain because they expect the two candidates to be alike. It also predicts that, following a polarization, turnout of middle-of-the-road (with respect to the expected candidates' positions) citizens increases. The theory of abstention by alienation produces predictions about who is going to vote that are very sensitive to the perceived candidates' positions. In particular, if candidates are perceived to be relative moderates, citizens with extreme positions are the ones who may want to abstain, as they are the ones who are eventually too far from both candidates. As candidates are perceived to be more and more polarized, the proportion of extreme citizens who abstain decreases and, eventually, an increasingly proportion of middle-of-the -road citizens will want to abstain. Conversely, our theory predicts that only middle-of-the-road citizens may want to abstain and this is because they have the highest probability and cost of making the wrong voting choices. In our model, a polarization does not affect turnout decisions of informed citizens because their cost of voting is zero. However, by increasing everywhere the cost of uninformed citizens of making voting mistakes, a polarization decreases turnout of middle-of-the-road citizens.

Palfrey and Poole (1987), empirically investigate the relationship between policy positions, exogenous information, and turnout. They find, as predicted by our model, that middle-of-the-road citizens are the most likely to abstain and that uninformed voters are not responsive to candidates' actual positions. However, while our model predicts that we should

[21] Abstention by indifference implies that when candidates are (on expectation) symmetrically located around the center of the policy spectrum, moderate voters will rationally remain uninformed because they are the most likely to abstain even after knowing the real positions of candidates. This theory, however, does not provide a rational for information acquisition by non-indifferent voters.

observe more informed voters among weak partisans and middle-of-the-road citizens, they find that, individuals with high level of information tend to be more extreme than those with a lower level of information. There are different ways the implications of our model could be reconciled with the empirical findings of Palfrey and Poole. First, holding the prior distribution of candidates' policies fixed, when most of the electorate is located intermediately with respect to the candidates' policy support (as it is found, for example, in Poole and Rosenthal (1984)), there is a higher proportion of extreme citizens (with respect to their support) who would invest in information. Second, consistent with Campbell et al. (1960), Fiorina (1981), and Zaller (1989), who support the idea that voters with party affiliations are more exposed to political information through their participation to the political world, the model could be enriched to allow individuals with a party attachment (who typically are more likely to have extreme policy positions) to receive free or low-cost political information. An empirical investigation of our model is however beyond the scope of this paper and is left for future research.ch.

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Appendix

Proof of Proposition 1: To prove (a) it is sufficient to show that, for any citizen j, $c_j(D) < c_j(R)$ is equivalent to $E[u_j^D - u_j^R \mid \Omega_j] > 0$. Using the definition of the cost of voting, we have that $c_j(D) - c_j(R) = E[1\left\{u_j^D < u_j^R\right\} \cdot (u_j^R - u_j^D) | \Omega_j] - E[1\left\{u_j^D > u_j^R\right\} \cdot (u_j^D - u_j^R) | \Omega_j]$. That is, $c_j(D) - c_j(R) = E[u_j^R - u_j^D | \Omega_j]$. The proof of (b) follows directly from (a) and the specification of the payoff function.■

Proof of proposition 2: Without loss of generality, we concentrate on a voter who, if uninformed, would optimally votes for R, i.e. $y_j > 0$ (the case of $y_j < 0$ is completely analogous). The voter will make voting mistakes whenever the candidates' positions are such that $u_j^R - u_j^D < 0$, that is, when $y_j < \frac{y_R + y_D}{2}$. Clearly, if $y_j \geq \frac{b-a}{2}$, $c_j(R) = 0$. Consider now the case where $y_j < \frac{b-a}{2}$. For any given y_D, citizen j's will make a mistake if $b > y_R > 2y_j - y_D$. His cost of voting for R can be written explicitly as $c_j(R) = \int_{-b}^{-a} \int_{\min\{b, 2y_j - y_D\}}^{b}$ $[y_R^2 - y_D^2 - 2y_j(y_R - y_D)]\ f(y_D, y_R)\ d_{y_R} d_{y_D}$. All we need to prove is that $\frac{\partial c_j(R)}{\partial y_j} < 0$. Using the Leibniz rule we have that $\frac{\partial c_j(R)}{\partial y_j} = \int_{-b}^{-a} \left(\int_{\min\{b, 2y_j - y_D\}}^{b} -2(y_R - y_D) f(y_R | y_D) dy_R \right) f_D(y_D) \cdot d_{y_D} = \int_{2y_j - b}^{-a} \left(\int_{2y_j - y_D}^{b} -2(y_R - y_D) f(y_R | y_D) dy_R \right) f_D(y_D) \cdot d_{y_D} < 0$.■

Proof of proposition 5: Without loss of generality consider a voter with $y_j > 0$, who optimally votes for R. The cost of voting under the prior F and the prior F' are, respectively, $c_j(R|F) = \int_{-b}^{-a} \left(\int_{\min\{b, 2y_j - y_D\}}^{b} [y_R^2 - y_D^2 - 2y_j(y_R - y_D)] f(y_R | y_D) dy_R \right) f_D(y_D)\ d_{y_D}$ and $c_j(R|F') = \int_{-b-\Delta}^{-a-\Delta} (\int_{\min\{b+\Delta, 2y_j - x_D\}}^{b+\Delta} [x_R^2 - x_D^2 - 2y_j(x_R - x_D)] f'(x_R | x_D) d_{x_R})\ f'_D(x_D)\ d_{x_D}$. By applying the following transformation of variables, $x_D = y_D - \Delta$, and $x_R = y_R + \Delta$, using the definition of polarization, and rearranging, the last expression becomes $c_j(R|F') = \int_{-b}^{-a}$ $(\int_{\min\{b, 2y_j - y_D\}}^{b} [{y_R}^2 - y_D^2 - 2y_j(y_R - y_D)] f(y_R | y_D) d_{y_R})\ f_D(y_D)\ d_{y_D} + 2\Delta \int_{-b}^{-a} (\int_{\min\{b, 2y_j - y_D\}}^{b} [y_R + y_D - 2y_j] f(y_R | y_D) d_{y_R}) f_D(y_D) d_{y_D} = c_j(R|F) + B$, where $B > 0\ \forall\ y_j < \frac{y_R + y_D}{2} = \frac{(y_R + \Delta) + (y_D - \Delta)}{2}$.■