Voter Turnout and Electoral Competition in a Multidimensional Policy Space*

Rafael Hortala-Vallve

London School of Economics

r.hortala-vallve@lse.ac.uk

Berta Esteve-Volart

York University

berta@econ.yorku.ca

October 2010

Abstract

We analyze the interaction between electoral competition and voters' decision to vote. We show that when voters consider both the benefits and the costs of voting, politicians offer differentiated policies to motivate citizens to vote. In particular, politicians adapt their policies to the most sensitive voters—thus less sensitive voters abstain on the grounds of perceiving *politicians as being too similar*. In a multidimensional policy space, this implies that citizens who only care about a few issues do not vote.

Keywords: Turnout, Electoral Competition

JEL Classication: D72, P16

1   Introduction

Voting in elections is considered one of the most important forms of participation in representative democracies; therefore it is not surprising that a large literature analyzes the determinants of voter turnout. This paper analyzes how politicians might try to influence turnout, and how they strategically react to voters' decisions. The theoretical model in this paper links turnout and electoral competition to examine the interaction between voters and political parties.

Following the seminal work by Downs (1957), models of electoral competition have shown that politicians have incentives to move towards the median voter in order to attract at least half of the electorate. As a result, and given that rational voters turn out to vote only if the benefits of doing so outweigh the costs, more electoral competition leads to lower voter turnout.

We challenge this view by proposing a simple model *à la* Wittman (1977), where policy motivated candidates spatially compete to implement their announced policy. We focus our attention to a situation with only two candidates.[1] In our model, voters only vote if candidates offer platforms that are sufficiently different. If both candidates' platforms converge to the median voter's most preferred platform, then there are no gains from selecting one candidate over another; thus, given that voting is costly, no one turns out to vote. Consequently, politicians offer differentiated policies (away from the median voter) to provide incentives for some voters to turn out at the polls—in other words, in order to avoid *abstention from indifference*, parties offer policies that diverge. The intuition behind our model is that a voter will be more likely to vote if she perceives the two political parties as more different (with respect to her own policy preferences). A related implication of the model is that moderate voters tend to vote less than voters who report to be either liberal or conservative. Finally, when we consider a multidimensional policy space, we find that only voters who care about most of the issues (or who are politically better educated) perceive enough difference between political parties and therefore vote.

This paper introduces a straightforward model to explain how political competition might affect voter turnout. Our model might help to rationalize the increasing voter apathy: in a complex political scenario with many dimensions, political competition leads to the perception of only slight differences among platforms in each individual dimension. For that reason, only voters who care about most of the issues, or who are politically educated, are able to perceive differences between platforms large enough for their vote to be cast; the rest of the electorate abstains.

We are thus left with an inherent contradiction. A rich political system leads parties to compete and, hence, to offer very similar platforms. In turn, this competition depresses voter turnout; therefore, representatives are elected by only a minority of the electorate. This can weaken a representative's mandate, and ultimate affect the legitimacy of the political system.[2]

The rest of the paper is organized as follows. In Section 2, we relate this study to the more relevant existing literature. Section 3 introduces the basic model, where we explore parties' strategies under electoral competition, in a setting where the policy space is unidimensional and voters are homogeneous. In Section 4 we relax the assumption of voters' homogeneity; and in Section 5 we assume a multidimensional policy space. Finally, Section 6 discusses the robustness of our results and our conclusions.

2 Related literature

The body of literature in economics and political science that deals with voter turnout and political competition is vast; however, this Section cannot offer a comprehensive review of this literature. What

---

[1] Extending our model to a multiparty context is indeed interesting but out of the scope of the present paper.

[2] In the same way that competition between firms may erode the firms' profits, we show how competition between political parties erodes their electoral support and decreases turnout. In *An Economic Theory of Democracy* Downs does not mention that a highly competititve electoral system yields low turnout because at no point he brings together both his theories of voting and electoral competition.

follows highlights the most relevant papers for our analysis.

As mentioned above, it was Downs (1957) who introduced the most basic notion of spatial electoral competition and derived the well-known convergence result. Since then, the literature has offered different ways to explain the divergence of political candidates: by (1) introducing politicians' uncertainty about voters' preferences (Calvert 1985 and Wittman 1983)[3], (2) considering the threat of a third party entering the election (Palfrey 1984), (3) having parties determine the national policy when candidates compete in different constituencies (Eyster and Kittsteiner 2004, Callander 2003), (4) considering dynamic incentives (Alesina 1988), (5) admitting that any individual could run for election (Besley and Coate 1997) or, finally, (6) assuming an incumbency advantage (Bernhardt and Ingberman 1985). Most similar to our argument, Ursprung (1990) shows that candidates have incentives to offer differentiated platforms in order to attract campaign contributions -when candidates converge, citizens do not have incentives to favour any of them. Our paper will offer an alternative way to overcome the convergence result by combining the electorate's turnout decision and the spatial model of electoral competition.

The normative evaluation of policy convergence remains contentious in the literature. Policy convergence is optimal when voters are risk averse (see Myerson 1995 or Persson and Tabellini 2000). However, when politicians observe imperfect signals about the citizens' preferences divergence may insure voters against biases in the candidates' perceptions (Ossokina and Swank 2004).

Few authors introduce the turnout decision into a model of electoral competition. On the one hand, *probabilistic voting models* are proposed as a means to allow voters who are indifferent across platforms to abstain with some probability (Hinich and Ordeshook 1969, Hinich *et al* 1972). This assumption smoothens the candidates' payoffs, and ensures the general existence of two-candidate electoral equilibria. However, in equilibrium both parties converge. On the other hand, Myerson (2000) proposes the *theory of large Poisson games*, where the size of the electorate is supposed to be a random variable. The drawback of that approach is that it leads to platform convergence, and thus zero voter turnout whenever there is a unique policy that maximizes the electorate aggregate utility.[4]

The empirical literature on voter turnout spans several decades and countries. Related to the analysis in this paper, there exists a substantial literature on policy voting in US elections.[5] These papers try and assert whether the electorate is sensitive to difference in platforms, what has been called 'issue difference'. While early work by Campbell *et al* (1960) and others argued that voters were not able to perceive differences between candidates' policies, subsequent evidence has been more favorable to the existence of such sensitivity (Aldrich *et al* 1989, Pomper 1972, Page and Brody 1972 with regards to the Vietnam war, and Palfrey and Poole 1987).

---

[3] Matsushima (2007) shows that divergence also holds in a runoff system when there is uncertainty about the median's preferred policy.

[4] Castanheira (2003) extends Myerson's model and is able to explain declining turnout rates in the US. His model takes the distance between candidates as given; instead, we endogenise it.

[5] See Sapiro (2001) for a review on literature that uses data from the National Election Studies.

3   A unidimensional policy space

We consider the simplest models of voter turnout and spatial electoral competition that are able to capture the features of interest. Let us assume that two politicians compete to implement their preferred policy, and voters only vote when the benefits from doing so outweigh the costs. We introduce the equation in the *Calculus of Voting* (Downs 1957):

$$p \cdot A \geq C$$

where p denotes the probability of being pivotal, A denotes the utility difference between the most preferred politician and the remaining one, and C denotes the cost of voting (that is, the opportunity cost of going to the polls). We assume $p \in (0, 1)$ and $C > 0$ in order to avoid trivial solutions.

There is a large debate in the literature about the consideration of perfectly rational voters who calculate the probability of being pivotal in a given election. Not only is such an assumption controversial, but it also implies infinitessimal benefits from voting when considering large electorates, where turnout would tend to zero (see, for instance, Palfrey and Rosenthal 1983). The fact that there is empirical evidence of an increase in turnout when elections are perceived to be close suggests that this effect exists (see for instance the seminal reference Riker and Ordeshook1968). However, the high turnout observed in the real world would instead suggest that voters are not perfectly rational—or, in Daniel Kahneman's words, that they may be led by intuition and impulse, rather than reason.[6]

We avoid such a debate by assuming that the probability of being pivotal is exogenously given and hence focus our attention on the simple rationale behind our analysis. Nevertheless, all of our qualitative results still hold even if we relax this assumption and consider a finite population of voters. In particular, in the Appendix we show that all our results hold when considering a finite population. This analysis is relegated to the Appendix because the existence of equilibrium relies on the precise location of voters' preferred policies thus the presentation of our results is slightly more complicated and may obscure the message we want to convey.[7]

An alternative way to interpret our model would be to assume that voters are expressive, that is, that voters like to show support for their preferred alternative when they perceive the existence of different options. If that is the case, p should not be interpreted as the probability of being pivotal. Rather, it should be interpreted as the expressive value or benefit of voting, per unit of perceived difference between the platforms. Precisely, Hillman (2010) reviews the possibility of expressive behavior in economics and politics and reports evidence on the fact that expressive actions are more likely when the probability of being pivotal is small (as is indeed the case in large elections).

Let us consider a compact and convex unidimensional policy space $\mathcal{P} = [-1, 1]$. There is a continuum of voters whose preferred policy is uniformly distributed along $\mathcal{P}$. Voter i's preferred policy is denoted g^i. Whenever a policy is implemented, voter i gets a disutility equal to the distance between the implemented policy and the policy she prefers: $U_i(g) = -d(g, g^i) = -|g - g^i|$.

---

[6] See Daniel Kahneman's 2002 Nobel Prize lecture.
[7] In Section 6 we further discuss the robustness of our results to various extensions.

Policies are implemented by an elected politician. There are two polarized candidates, L (left) and R (right), who compete in order to implement their announced policies. Candidates only care about the policy implemented by the government, as first proposed by Wittman (1977). Left and right candidates' preferred polices are equal to -1 and 1, respectively. This is in contrast with the Downsian model of electoral competition, where politicians are solely driven by their desire to win office. Our assumption adds another component to the analysis: that politicians not only want to offer a policy that attracts at least half of the electorate, but they also care about the policy they offer. Having policy-driven polarized candidates introduces a trade-off: politicians need to move towards the median voter to attract a majority of the electorate, at the cost of moving away from their ideal policy. Below, we detail the robustness of our results to the case where politicians also seek rents.

Every candidate simultaneously announces a platform to the electorate $(g^\kappa, \kappa = L, R)$, which is credible in the sense that every candidate is able to commit to implement the announced policy if elected. The winner is decided by plurality voting, i.e., the candidate with the largest share of votes wins. In case of tie, a fair lottery is played, and both announced policies are implemented with equal probability. Therefore we can define the expected payoff of candidate L as

$$P_L(g^L, g^R) \cdot U_L(g^L) + P_R(g^L, g^R) \cdot U_L(g^R)$$

where $U_L(g) = -d(g, -1)$ and $P_\kappa(g^L, g^R)$ is the probability that candidate κ wins the election given the announced platforms (g^L, g^R). Note that $P_L(g^L, g^R) = 1 - P_R(g^L, g^R)$ for all $(g^L, g^R) \in \mathcal{P} \times \mathcal{P}$. The expected payoff of candidate R is defined analogously.

Next we describe the second stage of the game. In this stage, voters need to decide whether to abstain, vote for candidate L, or vote for candidate R, once politicians have announced their respective platforms.

For any voter i the benefits from voting are

$$p \cdot \frac{1}{2} \left| U_i(g^L) - U_i(g^R) \right|$$

where p is the probability of voter i being pivotal. The utility difference is multiplied by one half because a single voter can only create a tie when his/her candidate loses the election or break a tie in favour of his/her preferred candidate. Given that p is exogenous, a citizen votes if and only if

$$\frac{1}{2} \left| U_i(g^L) - U_i(g^R) \right| \geq \frac{C}{p} =: c.$$

Whenever a citizen votes, she does so in favor of her preferred candidate—the one who is closest to her bliss point. In the case where she is indifferent, she abstains.

The former description induces a two-stage extensive form game. Solving it by backward induction proves the following result.

Proposition 1 *Two candidates with bliss points $g^L = -1$ and $g^R = 1$ compete for votes. In the*

case where voters only vote if the benefits of doing so outweigh the costs c, in the unique equilibrium candidates announce policies that diverge, and these policies are $(g^L, g^R) = (-c, c)$. Voters with bliss point to the left of $-c$ vote for candidate L, voters to the right of c vote for candidate R, and voters in between abstain.

Proof. In equilibrium, both candidates obtain the same number of votes thus $P_L(g^L, g^R) = P_R(g^L, g^R) = \frac{1}{2}$. This follows immediately from realizing that if, for example, candidate R receives more votes than candidate L, the latter is better off by proposing a platform infinitesimally to the left of g^R. In this case, all voters perceive both candidates as too similar and hence abstain. Therefore, the policy that is slightly to the left of g^R is implemented with probability one half, and candidate L is better off.

Given that candidates are policy driven, there is a *centrifugal* force that tends to separate their proposed policies.[8] This implies that politicians never choose policies such that $d(g^L, g^R) < 2c$. If that was the case, any candidate can move slightly towards their preferred policy while preserving the probability that both candidates win the election with probability one half.

Given that candidates want to win the election, there is a *centripetal* force that brings the proposed policies together. This implies that politicians never choose policies such that $d(g^L, g^R) > 2c$. If that was the case (recalling that in equilibrium both candidates have an equal probability of winning the election), any candidate could move slightly towards the median policy and win the election with probability one, with an arbitrarily small cost in terms of policy.

The previous two conditions imply that $d(g^L, g^R) = 2c$.

Finally, given that the electorate is uniformly distributed on $\mathcal{P}$, our equilibrium is symmetric—both candidates need to be equidistant from the median voter.[9] Hence, the announced pair of equilibrium policies is $(g^L, g^R) = (-c, c)$. ∎

The pair of policies $(g^L, g^R) = (-c, c)$ is indeed an equilibrium: a deviation towards the median voter does not affect the probability of winning the election, but it moves the deviating candidate's policy away from her bliss point; conversely, a deviation towards the extremes makes the deviating candidate lose the election with certainty.

Figure 1 depicts the equilibrium policies and the equilibrium behavior of voters. The figure shows that a centrist or moderate voter derives a similar (dis)utility from the policies implemented by any of the two candidates; it follows that the centrist voter abstains because the utility difference between the policies implemented by the candidates does not compensate for the voter's costs of voting. For instance, the voter with bliss point $g^i = 0$ sees both platforms as equally apart from her most preferred policy, and hence gets null benefit from voting. Note also that both candidates extract all possible gains from abstention by shifting their offered platforms towards their most preferred policy, that is, towards the extremes. Abstention thus introduces a centrifugal force that counteracts the centripetal force that arises from electoral competition, and candidates diverge exactly by $2c$, inducing a proportion of

---

[8] In spatial models of electoral competition a *centrifugal* force (as opposed to a *centripetal* force) is usually understood as an incentive for politicians to offer differentiated platforms or platforms away from the median voter.

[9] A non-symmetric distribution implies asymmetric offered platforms.

c of the electorate to abstain. That is, a higher voting cost increases abstention, but it also increases divergence between platforms.
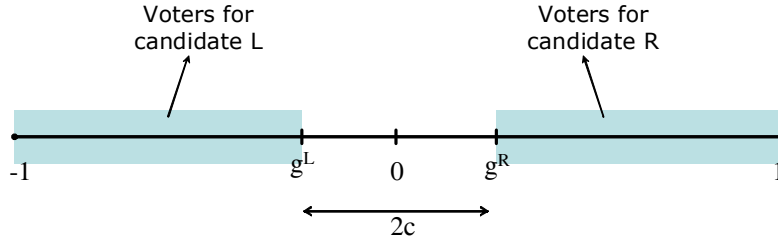

Figure 1: The unidimensional case

There has been a persistent concern in the literature about the convergence result obtained in the standard model of electoral competition. The simple model above offers a different way to explain divergence. In terms of turnout, the result in Proposition 1 is also consistent with US elections data where we can observe that non-voters tend to have more centrist preferences than voters (see Hortala-Vallve and Esteve-Volart, 2010).[10]

Note also that whenever politicians are only motivated by winning office, the strategies described in Proposition 1 still constitute an equilibrium given that no candidate can improve her probability of winning the election. Nevertheless, in that case the equilibria are not unique: any pair of policies in the interval $[-c, c]$ is an equilibrium. This is because a party that offers a policy on the former interval ensures that the opposing party can never attract more than half of the electorate. Introducing an infinitesimal preference towards the implemented policy, and assuming that politicians are sufficiently polarized, would lead to our uniqueness result—in that case, candidates select the described equilibrium out of all possible pairs from the interval $[-c, c]$.

4   Heterogeneous voters

In the previous section we examined the interaction between voters and political parties in a setting where voters are homogenous. As a first extension to the basic model, we assume that there are two types of voters: voters with high opportunity costs of voting, and voters with low opportunity costs of voting $(c^h > c^l > 0)$. We further assume that the distribution of voting costs and policy preferences across the population are independent. That is, the probability of being a voter with low costs (α) is independent of policy preferences.

Given the above description of voters, we can reinterpret high cost voters as voters who are less sensitive to the difference between platforms. Both type of voters turn out to vote only when the

---

[10]See also Wittman (1977), who argued that the electorate is more ideological than the country as a whole.

benefits outweigh the costs:

$$\begin{cases} \frac{1}{2} \left| U_i(g^L) - U_i(g^R) \right| \geq c^h \\ \frac{1}{2} \left| U_i(g^L) - U_i(g^R) \right| \geq c^l. \end{cases}$$

Equivalently,, we can write that these voters turn out their costs are equal but when they derive different marginal utilities from the distance between platforms:

$$\begin{cases} \lambda^h \cdot \frac{1}{2} \left| U_i(g^L) - U_i(g^R) \right| \geq 1 \\ \lambda^l \cdot \frac{1}{2} \left| U_i(g^L) - U_i(g^R) \right| \geq 1. \end{cases}$$

where $\lambda^h = \frac{1}{c^h} < \lambda^l = \frac{1}{c^l}$. This rewriting of the equations of the calculus of voting allows us to reinterpret voters with heterogeneous voting costs as voters with equal voting costs with heterogeneous marginal valuations of the candidates proposed platforms: in this re-interpretation, voters with higher costs are less sensitive to the distance between platforms.

A similar reasoning as in the previous section shows that a unique equilibrium exists in which politicians diverge by a distance $2c^l$. When the distance is strictly larger than $2c^l$, a candidate can unilaterally move her policy towards the median and win the election with certainty. Consequently, in the only equilibrium, candidates announce platforms $(g^L, g^R) = (-c^l, c^l)$, as long as there is a (arbitrarily small) positive mass of low opportunity cost voters.

Proposition 2 *Two candidates with bliss points $g^L = -1$ and $g^R = 1$ compete for votes. Any voter can be of either of two types: with probability $\alpha > 0$ her costs are low, and with probability $(1 - \alpha)$ her costs are high ($c^h > c^l > 0$). When voters only vote if the benefits of doing so outweigh their costs, in the unique equilibrium candidates announce policies that diverge, and those policies are $(g^L, g^R) = (-c^l, c^l)$. Low cost voters to the left of $-c^l$ vote for candidate L, low cost voters to the right of c^l vote for candidate R, and voters in between abstain. All high cost voters abstain.*

Given the Proposition above, we can conclude that electoral competition leads politicians to target only the most sensitive group. The situation where the whole population is targeted does not constitute an equilibrium, because politicians would have an incentive to unilaterally deviate towards the median voter, making the whole set of less sensitive voters abstain, and hence capture more than half of the most sensitive voters.

Corollary 1 *Electoral competition leads politicians to target only the most sensitive voters, hence less sensitive voters abstain.*

There is an immediate consequence of this simple model that contrasts with the existing literature. In case that the two sets of voters have sufficiently different median points, the model leads to non-existence of equilibrium. Thus, allowing for the heterogeneity of voters in a unidimensional model with single-peaked preferences leads to non-existence of equilibrium. This is in stark contrast with most of the literature in unidimensional spatial electoral competition, where an equilibrium usually exists.

Heuristically, we have provided a rationalization for some stylized facts in voter turnout. It has been found elsewhere that a greater involvement in social institutions or a higher level of education or income is associated with a higher likelihood to vote. We can integrate these findings and our model by assuming that voters who are more involved with social institutions, more educated, or wealthier, tend to be more sensitive to the policies that politicians offer. Finally, following Corollary 1, such voters are more likely to vote, because political competition tends to target their interests.

Next we turn to extending the rationale of Corollary 1 to a multidimensional policy space, where the applicability and relevance of our model to the real world might become clear.

5   A multidimensional policy space

Politicians do not offer policies on a single dimension. Party platforms have reached a level of complexity that few voters can grasp. Pennings (2002) compares the *manifestos* of most political parties in the European Union and shows that the policy space is composed by more than two dimensions. Hence, the unidimensional case, even though useful in some instances, may not be an appropriate representation of the complex political arena. A multidimensional model is also consistent with the belief that parties can no longer be classified only through a unidimensional left-right scale.

Ensuring the existence of equilibrium in multidimensional models of electoral competition requires very restrictive assumptions (see Plott 1967). McKelvey (1976) shows that when these conditions are met the agenda setter determines the final allocation. We avoid such considerations in the present paper and propose the simplest model that allows us to extend Corollary 1's intuition to a multidimensional world.

Important as the dimensionality of the policy space is the fact that most voters are interested in only a few issues. Given that electoral competition targets only the most sensitive voters, the distance between policies in a multidimensional world will be the minimal distance needed to attract those voters. Therefore, a voter who only cares about a few issues and perceives little distance between the platforms would not generally be compensated for her opportunity cost of voting. Electoral competition in a multidimensional world targets those citizens that care about most issues. These citizens are the only ones that perceive enough distance between platforms because they add the utility difference between platforms across all the dimensions they care about. The rest of citizens perceive politicians as "being all alike" and, as a result, show no interest towards politics and ultimately abstain.

Let us consider an extension to the model above to capture this intuition. Assume a bidimensional policy space ($\mathcal{P} = [-1, 1]^2$), and assume that the preferred policies of the L and R politicians are $(-1, -1)$ and $(1, 1)$, respectively. Moreover, suppose that the first issue relates to an aspect of the welfare state important to all voters. Additionally, the second issue relates to an aspect that only concerns a proportion $\alpha \in (0, 1)$ of the population (an issue that only concerns particular interest groups such as, for instance, abortion, university tuition fees, stem cell research). More generally, we could consider that the relative intensity across issues varies among different groups of voters.

The most sensitive voters in this scenario are those who care about both issues. Their disutility from an implemented policy g is computed according to the norm sub one or taxicab norm distance:[11]

$$U_i^h(g) = -d(g, g^i) = -\left(|g_1 - g_1^i| + |g_2 - g_2^i|\right).$$

The less sensitive voters' preferences are computed as in the unidimensional setting:

$$U_i^l(g) = -d(g, g^i) = -|g_1 - g_1^i|.$$

Assume that all voters have an identical cost of voting $c > 0$, that g is uniformly distributed on $\mathcal{P}$, and that the probability of being a voter who cares about both issues (α) is independent of policy preferences.[12] The following Proposition characterizes the unique equilibrium.

Proposition 3 *Two candidates with bliss points $g^L = (-1, -1)$ and $g^R = (1, 1)$ compete for votes. Any voter can be of either of two types: with probability $\alpha > 0$, she only cares about the first policy dimension, and with probability $(1 - \alpha)$, she cares about both policy dimensions. In the case that voters only vote if the benefits of doing so outweigh their costs c, in the unique equilibrium candidates announce policies that diverge, and these policies are, respectively, $(g^L, g^R) = \left\{\left(\frac{-c}{2}, \frac{-c}{2}\right), \left(\frac{c}{2}, \frac{c}{2}\right)\right\}$. Voters who care about one issue only abstain, while voters who care about both issues vote for L if and only if $g < \left(\frac{-c}{2}, \frac{-c}{2}\right)$, and for R if and only if $g > \left(\frac{c}{2}, \frac{c}{2}\right)$.*[13]

The proof is analogous to the proof of Proposition 2. Once again, politicians adapt their policy to the most sensitive voters and only the voters to either side of the offered platforms vote for their closest party. Voters in between, as well as less sensitive voters, abstain (see Figure 2).

Political parties are targeting their policies to an increasing number of special interest groups by introducing new issues into the political agenda. The increase in the number of issues (to which some voters are very sensitive), together with the fact that political competition tends to respond only to the most sensitive voters (as pointed out in Corollary 1), makes politicians differ on each issue only marginally. For that reason, only voters who care about most of the issues, or voters who are politically well educated, are able to perceive a relative difference between parties that is large enough to induce them to vote. The rest of the population are not able to perceive a big difference between political parties, and therefore abstain on the grounds that *politicians are all alike* and hence voting for either of them would not make a difference.

---

[11] Eguia (2009) provides and axiomatic foundation for using the taxicab norm in multidimensional settings.

[12] Empirically it may be the case that the probability of being a voter that cares about both dimension is correlated with policy preferences. Acknowledging this fact is important when empirically testing the model but does not affect the results in Proposition 3.

[13] The vector inequalities should be interpreted componentwise (i.e., $g > 0 \Leftrightarrow g_n \geq 0, \forall n$).
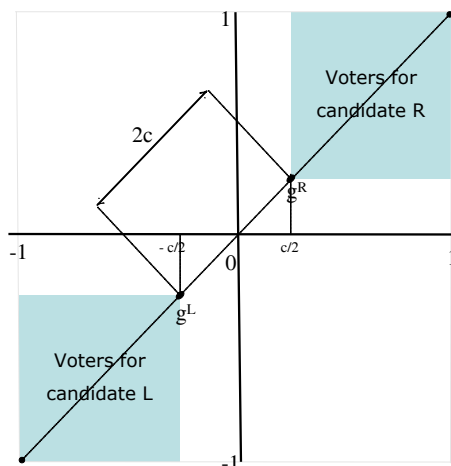
Figure 2: The multidimensional case

6   Concluding Remarks

In this paper we have built a simple model to analyze the interaction between electoral competition and voters' decision to vote. We have shown that, if voters consider both the benefits and the costs of voting, politicians offer differentiated policies to motivate voters. In particular, politicians adapt their policies to the most sensitive voters—thus, less sensitive voters abstain on the grounds of perceiving *politicians as being too similar*. In a multidimensional policy space setting, our results imply that voters who only care about a few issues do not vote.

This paper relies on a very simple theoretical framework. This simplicity delivers clear-cut results with a clear intuitive appeal. It comes, however, at a cost: changing our turnout model in particular ways might cancel some of the results. For instance, assuming that voters costs may be arbitrarily small implies that politicians' announcements converge to the median voter's preferred policy, which would lead to zero turnout.[14] Similarly, the assumption that voters for whom the net benefit from voting is zero abstain, leads, once again, to no participation in elections.

Indeed, a model where there is uncertainty about the candidates and/or voters would be able to deal with the concerns that arise in our model. Technically, this implies using the standard probabilistic voting model instead of the (deterministic) Downsian one.[15] One simple way of doing so is by assuming that the candidates' announced platforms are not perfectly perceived by voters. This would smooth our voters' behavior and would lead to robust results. The previous fragile aspects of our present model would be avoided at the cost of technical complexity. Summing up, our model is simple but captures the essential features of many complicated models, and is simple enough that its message is clear and straightforward.

---

[14] Convergence when costs are arbitrarily small is an immediate consequence of Corollary 1: politicians target the most sensitive voters, and when costs are arbitrarily small, they behave as if there are voters with no costs ($c^l = 0$).

[15] See chapter 12 in Mueller (2003) for a detailed explanation and further references on *probabilistic voting.*

In sum, this paper tries to build on the existing knowledge on voter turnout by analyzing the interaction between electoral competition and voters' turnout decision. In our model, politicians converge to the preferred policy of the median voter, but they strategically choose divergent policy platforms in order to provide incentives for some voters to turn out. In a multidimensional world, this implies that the only voters that turn out at the polls are those who care about most issues.

In a companion paper (Hortala-Vallve and Esteve-Volart, 2010), we use data from the United States' National Electoral Studies for 1972-2000 and find that a perceived low difference between the platforms of both the Democratic and Republican parties tends to decrease an individual's probability to vote. Consistent with our theoretical model, we show that individuals who perceive the two parties as relatively different on more issues are significantly more likely to vote.

References

[1] Aldrich, J. H., J. L. Sullivan and E. Borgida (1989), "Foreign Affairs and Issue Voting: Do Presidential Candidates "Waltz Before a Blind Audience?", *American Political Science Review*, Vol. 83

[2] Alesina, A. (1988), "Credibility and Policy Convergence in a Two-Party System with Rational Voters", *The American Economic Review*, 78

[3] Bernhardt, D. and D. Ingerberman (1985), "Candidate Positioning and the 'Incumbency Effect'", *Journal of Public Economics*, Vol. 27

[4] Besley, T., and S. Coate (1997), "An Economic Model of Representative Democracy", *The Quarterly Journal of Economics*, 112

[5] Callander, S. (2003) "Electoral Competition in Heterogeneous Districts", mimeo

[6] Calvert, R. (1985), "Robustness of the Multidimensional Voting Model: Candidate Motivations, Uncertainty and Convergence", *American Journal of Political Science*, Vol. 29

[7] Campbell, A., P. Converse, W. Miller, and D. Stokes (1960), The American Voter, New York: Wiley

[8] Castanheira, M. (2003), "Victory margins and the paradox of voting", *European Journal of Political Economy*, Vol 19

[9] Downs, A. (1957), An Economic Theory of Democracy, New York: Harper

[10] Eguia, J. (2009), "Foundations of Spatial Preferences", *New York University*, mimeo

[11] Eyster, E. and T. Kittsteiner (2004), "Party Platforms in Electoral Competition with Many Constituencies", mimeo, London School of Economics

[12] Hillman, A. (2010), "Expressive behaviour in economics and politics", *European Journal of Political Economy*, forthcoming

[13] Hinich, M. and P. Ordeshook (1969), "Abstentions and Equilibrium in the Electoral Process", *Public Choice*, Vol 7

[14] Hinich, M., J. Ledyard, and P. Ordeshook (1972), "Nonvoting and the Existence of Equilibrium under Majority Rule", *Journal of Economic Theory*, Vol 4

[15] Hortala-Vallve, R. and B. Esteve-Volart (2010), "Turnout in a Multidimensional Policy Space", mimeo, London School of Economics

[16] Kahneman, D. (2002), "Maps of Bounded Rationality: A Perspective on Intuitive Judgement and Choice", *Nobel Prize Lecture*

[17] Matsushima, N. (2007), "Uncertainty of voters' preferences and differentiation in a runoff system", *European Journal of Political Economy*, Vol 23

[18] McKelvey, R. (1976), "Intransitivities in Multidimensional Voting Models and Some Implications for Agenda Control", *Journal of economic Theory*, Vol. 12

[19] Mueller, D. (2003), *Public Choice III*, Cambridge University Press

[20] Myerson, R. (1995), "Analysis of democratic institutions: structure, conduct and performance", *Journal of Economic Perspectives*, Vol 9

[21] Myerson, R. (2000), "Large Poisson Games", *Journal of Economic Theory*, Vol. 94

[22] Ossokina, I. and O. Swank (2004), "The optimal degree of polarization", *European Journal of Political Economy*, Vol 20

[23] Page, B. I., and R. A. Brody (1972), "Policy Voting and the Electoral Process: The Vietnam War Issue", *American Political Science Review*, Vol. 66

[24] Palfrey, T. and H. Rosenthal (1983), "A Strategic Calculus of Voting", *Public Choice*, Vol. 41

[25] Palfrey, T. (1984), "Spatial Equilibrium with Entry", *Review of Economic Studies*, Vol. 51

[26] Palfrey, T and K. Poole (1987), "The Relationship between Information, Ideology, and Voting Behavior", *American Journal of Political Science*, Vol. 31

[27] Plott, C. (1967), "A Notion of Equilibrium and Its Possibility under Majority Rule", *American Economic Review*, Vol. 57

[28] Pennings, P (2002), "The Dimensionality of the EU Policy Space: The European Elections of 1999", *EUP*, Vol. 3

[29] Persson, T. and G. Tabellini (2000), *Political Economics: Explaining Economic Policy*, The MIT Press, Cambridge, MA

[30] Pomper, G. (1972), "From Confusion to Clarity: Issues and American Voters, 1956-1968", *The American Political Science Review*, Vol. 66

[31] Riker, W. and P. Ordeshook (1968), "A theory of the calculus of voting", *The American Political Science Review*, Vol. 62

[32] Ursprung, H. (1990), "Public goods, rent dissipation, and candidate competition", *Economics and Politics*, Vol 2

[33] Wittman, D. (1977), "Candidates with Policy Preferences: a Dynamic Model", *Journal of Economic Theory*, Vol. 14

[34] Wittman, D. (1983), "Candidate Motivation: a Synthesis of Alternatives", *The American Political Science Review*, Vol. 77

.

7   Appendix - model with a finite number of voters

There are n voters whose preferred policies (denoted x_i for $i = 1, ..., n$) belong to the interval $[-1, 1]$ and are common knowledge. The utility voter i derives from policy x is $u_i(x) = -|x - x_i|$; voters incur a cost $c > 0$ when voting.

There are two polarized candidates, L (left) and R (right),with preferred policies -1 and 1, respectively. Candidates simultaneously announce their platform to the electorate $(g^\kappa, \kappa = L, R)$. Voters' actions are described by the following equations:

$$\begin{cases} \text{vote for } L \text{ if } c \leq \frac{p_L}{2}\left(u_i\left(g^L\right) - u_i\left(g^R\right)\right) \\ \text{vote for } R \text{ if } c \leq \frac{p_R}{2}\left(u_i\left(g^R\right) - u_i\left(g^L\right)\right) \\ \text{abstain otherwise} \end{cases}$$

In words, for example, voter i votes for candidate L if the utility difference between candidate L and candidate R multiplied by the probability that the voter is pivotal is greater than the costs of voting. Note that the utility difference is multiplied by one half because a single voter can only create a tie when her candidate loses the election or break a tie in favor of her preferred candidate.

Before fully characterizing the equilibria of the model with a discrete number of voters we present two Lemmas that show that any equilibria has candidates not converging to the median voter's preferred policy and both candidates get an equal probability of winning the election (i.e., an equal number of votes).

Lemma 1 *If an equilibrium exists, candidates announced platforms do not converge to the median voter's preferred policy*

Proof. Assume there exists an equilibrium where both candidates converge to policy μ. As both candidates propose the same policy no voter turns out to the polls and both candidates have an equal chance of being elected. One profitable deviation has any of the candidates deviating towards their preferred policy while still keeping all of the electorate out of the polls. Note that a candidate's arbitrarily small deviation towards their preferred policy has the benefit of moving an implemented policy closer to her preferred one, and it has no costs in the probability of being elected (as long as the change in the proposed policy is small enough and as long as $c > 0$). ∎

The general specification above allows the existence of equilibria with zero turnout (e.g., costs of voting prohibitively high or not enough diversity in voters preferred preferences[16]). In what follows, we focus our attention on the equilibria with strictly positive turnout.

Lemma 2 *If an equilibrium with strictly positive turnout exists, both candidates receive the same number of votes.*

---

[16] Think for instance of a situation where all voters have the same preferred policy.

Proof. There can be no equilibria where a candidate receives strictly less votes than the other candidate. If so occurs, the candidate loses the election with probability one. In those circumstances, the losing candidate is better off by offering a policy marginally close to the other candidate's proposed policy. Such deviation implies a zero turnout thus both candidates are elected with equal probability; which implies that with probability one half the policy marginally close to the previous winning policy is elected. ∎

This Lemma implies that the probability that any voter is pivotal is equal to 1 (i.e., $p_L = p_R = 1$).

If an equilibrium with strictly positive turnout exists, candidates should be offering differentiated policies. Voters whose preferred policy lie exactly in between the proposed policies abstain. Given an equilibrium with proposed policies g^L and g^R, voters with preferred policies in the interval $\left(\frac{g^L + g^R}{2} - c, \frac{g^L + g^R}{2} + c \right)$ abstain. A necessary condition for an equilibrium to exist is that the median voter's preferred policy lies within this interval (otherwise, one of the candidates wins with probability 1). It follows that an equilibrium with strictly positive turnout exists only when the number of voters in $\left[-1, \frac{g^L + g^R}{2} - c \right]$ coincides with the number of voters in $\left[\frac{g^L + g^R}{2} + c, 1 \right]$.

The proposed policies $\left(g^L, g^R \right)$ constitute an equilibrium when candidates do not have a profitable deviation. Candidates do not wish to propose a policy closer to their preferred policy when this implies a loss in votes. For instance, candidate L does not want to move g^L marginally to the left only when there is a voter whose preferred policy is $\frac{g^L + g^R}{2} - c$ (this voter was previously indifferent between voting or abstaining, but would strictly prefer to abstain should the candidate propose a policy to the left of g^L). The same reasoning applies for candidate R thus the candidates do not want to deviate and propose policies closer to their preferred ones only when there is at least one voter whose preferred policy is $\frac{g^L + g^R}{2} - c$ and at least another voter whose preferred policy is $\frac{g^L + g^R}{2} + c$. Finally, candidates do not have incentives to propose policies closer to the median voter only when their preferred policies coincide exactly with the previously described policies, i.e., $g^L = \frac{g^L + g^R}{2} - c$ and $g^R = \frac{g^L + g^R}{2} + c$. Note that symmetric policies around c at a farther distance imply that there is a profitable deviation by moving towards the median's preferred policy. For instance, if candidate L deviates inwards in such circumstances she decreases the votes for her opponent (voter at $\frac{g^L + g^R}{2} + c$ now abstains) and wins the election with probability 1. Instead, symmetric policies around c at a distance of $2c$ imply that a deviation towards the median voter produces zero turnout and does not improve the deviating candidate's probability of being elected.

The necessary and sufficient conditions for the existence of an equilibrium with strictly positive turnout are summarized in the following Proposition.

Proposition 4 *An equilibrium with strictly positive turnout exists when there exist two voters with preferred policies x_L and x_R ($x_L < x_R$) such that the following two conditions are satisfied:*

1. $\# \{ i : x_i \in [-1, x_L] \} = \# \{ i : x_i \in [x_R, 1] \}$

2. $x_R - x_L = 2c$

In equilibrium, the left and right candidates propose policies $g^L = x_L$ and $g^R = x_R$ and win the election with equal probability. Voters to the left of x_L vote for candidate L, voters to the right of x_R vote for candidate R, and voters in between abstain.

It follows from the characterization of the equilibrium that whenever it exists, the equilibrium is unique.

In order to parallel this analysis with the one in the main text, we can impose more structure in the set of voters' preferred policies so that they are uniformly distributed in between the policy -1 and policy 1. Imagine there are n voters whose preferred policy is equal to $x_i = \frac{2i-1-n}{n-1}$ (for $i = 1, ..., n$). An equilibrium with strictly positive turnout exists when there exists i such that $c = x_i$. In this equilibrium, candidates propose policies $g^L = -c$ and $g^R = c$. Voters to the left of policy $(-c)$ vote for candidate L, voters to the right of policy (c) vote for candidate R, and voters in between abstain. Both candidates win the election with equal probability.[17]

---

[17] As long as c is a rational number between 0 and 1, there always exists a number of voters (possibly very large) for which an equilibrium exists.