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The optimal degree of polarization

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Abstract

In the literature on electoral politics, full convergence of policy platforms is usually regarded as socially optimal. The reason is that risk-averse voters prefer a sure middle-of-the-road policy to a lottery of two extremes with the same expectation. In this paper, we study the normative implications of convergence in a simple model of electoral competition, in which parties are uncertain about voters' preferences. We show that, if political parties have incomplete information about voters' preferences, the voters may prefer some degree of policy divergence. The intuition is that policy divergence enables voters to correct policies that are based on a wrong perception of their preferences.

JEL classification: D72
Keywords: Elections; Policy divergence; Probabilistic voting; Voters' preferences

1. Introduction

Part of the literature on electoral politics in a two-party system is based on the assumption that political parties are motivated by policy outcomes. The seminal papers are from Wittman (1977, 1983), and Hibbs (1977). One of the objectives of this literature is to provide an explanation for policy divergence. In partisan models, political parties usually have incomplete information about the preferences of the median voter. The implication is probabilistic voting: the probability that a party wins the elections is a smooth function of parties' policies. When parties can commit themselves to implement their platform, if elected, probabilistic voting is a necessary condition for policy divergence (Calvert, 1985).

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On the normative side, full convergence of parties' platforms is regarded as Pareto-optimal. Myerson (1995, p.78) writes:

> In fact, with risk-averse voters, an equilibrium in which both parties have a positive probability of winning can be Pareto-efficient only if the two parties converge to the same position.

Persson and Tabellini (2000, p.100) state:

> Because candidates and pivotal voters have concave utility over [the policy variable] g, they all have long-run preferences for a stable policy in the middle rather than a policy that shifts back and forth as governments change.

Furthermore, in various extensions of the median voter model, the optimality of the convergence of parties' platforms is taken as a starting point. Alesina (1988), for example, examines an infinitely repeated election game as a way to Pareto-improve on the one-shot Nash equilibrium with no convergence. More recently, Ortuno Ortin and Schultz (2000) have compared different systems of the public funding of political parties, using as criterion the degree to which these systems promote policy convergence.

This paper points out that when probabilistic voting is the result of uncertainty about the preferences of the median voter, welfare consequences of policy divergence depend crucially on the source of this uncertainty. When voters' preferences are stable, but the turnout at the elections and, consequently, the identity of the median voter is unknown, voters prefer convergence of platforms over divergence of platforms. When their preferences are subject to shocks that are not observed by parties, voters prefer divergence of platforms. The reason is that policy divergence enables voters to correct policies that are based on a wrong perception of their preferences.

This paper is organized as follows. The following section sets out two versions of a simple model of electoral competition that follows the lines of Wittman (1983) and Calvert (1985). The two versions differ in the nature of uncertainty about the median voter's preferences. First, we assume that the parties are uncertain about the identity of the median voter. Next we assume that the parties do not observe exogenous changes in the median voter's preferences. Section 3 presents the equilibrium of the political game. The results are well-known. When parties have different preferences over policy outcomes, uncertainty about the median voter's preferences may lead to divergence of policy platforms. We show that this result does not hinge on the nature of uncertainty about the median voter's preferences. In Section 4, we argue that the nature of uncertainty does affect the normative implications of policy divergence.

2. The model

This section sets out a simple model of two-party electoral competition. The parties, labeled L and R, have preferences defined on policy outcomes. In addition, the parties receive (exogenous) rents from holding office. Party L's preferences are represented by the following function:

$$U^{\mathrm{L}} = -(X - \theta^{\mathrm{L}})^2 + \lambda D_{\mathrm{L}} \qquad \lambda > 0 \tag{1}$$

where X denotes the policy outcome, θ^{L} is party L's bliss point, λ denotes the rents from holding office, and D_{L} takes the value one if party L is in office, and takes the value zero otherwise. Party R's preferences are represented by a similar function:

$$U^{\mathrm{R}} = -(X - \theta^{\mathrm{R}})^2 + \lambda(1 - D_{\mathrm{L}}), \tag{2}$$

where θ^{R} is party R's bliss point. Parties have different preferences over policy outcomes. To minimize straightforward algebra, we assume that $\theta^{\mathrm{R}} = -\theta^{\mathrm{L}} > 0$. Voters know Eqs. (1) and (2).

The election outcome is subject to uncertainty. More specifically, when parties choose their platforms, the preferences of the median voter m at the moment of the elections are unknown.[1] The main objective of this paper is to show that the source of this uncertainty is important for the welfare consequences of polarization. As to this source, we make two alternative assumptions. First, we assume that the median voter's expected bliss point is at zero, but as a result of uncertain voter turnout, the identity of the median voter is unknown (Ledyard, 1984). Formally,

$$U^{\mathrm{m}} = -[X - \mu]^2, \tag{3}$$

where μ is uniformly distributed on the interval $[-z; z]$. Under this assumption, each voter i has stable preferences

$$U^i = -[X - \theta^i]^2, \tag{4}$$

where θ^i is voter i's bliss point.[2]

Next, we assume that voters' preferences are subject to shocks:[3]

$$U^i = -[X - (\theta^i + \mu)]^2. \tag{5}$$

Under this assumption, voters know μ when voting, but parties cannot observe μ until after the elections. In other words, parties have imperfect information about voters'

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1 Since policy is one-dimensional and preferences of parties and (as we will see further) of voters are single-peaked, the vote of the median voter is decisive at the elections.

2 A recent empirical study by Narwa (2001) compares different generalizations of the voters' utility functions on the basis of real data. Narwa concludes that "the simple proximity model with a symmetric utility function having an identical shape for all voters seems to be in most cases a reasonable approximation for the theoretical framework" (Narwa, 2001, p. 71).

3 Two examples of exogenous shocks from recent history that have induced changes in voters' preferences are the terror attacks on the United States on 11 September 2001 and the Chernobyl nuclear accident on 26 April 1986. With respect to the latter, empirical evidence from two panel studies of Dutch voters, conducted a short time before and a short time after the accident should be mentioned. The results of the studies show that after the Chernobyl accident the attitudes of individual voters towards nuclear energy took a movement in a more conservative direction (see Van der Eijk et al., 1988; Van Holsteyn, 1987).

preferences.[4] There are several reasons for unanticipated changes in voters' preferences. Let us mention three of them. First, political parties may be more dogmatic than voters in the sense that parties are less sensitive to changes in the environment than voters (Harrington, 1993). Second, political parties are alienated from voters and do not observe the real consequences of their policies. The realization of the effects of past policies can have an impact on voters' preferences. Third, between the moment that parties announce their policies and the election date, new information about policy may become available.[5]

The idea that parties are uncertain about voters' preferences is supported by the fact that parties often turn to polls to ascertain voters' preferences. In practice, polls do not speak in one voice. Consequently, parties are not perfectly able to predict voters' responses to policies.

3. Platforms

In this section, we consider the equilibrium of the model described in the previous section.[6] In what follows we assume that if elected, parties can commit themselves to implement their announced policies. The consequences of relaxing this assumption will be briefly discussed at the end of the paper. An electoral equilibrium of the voting game is a pair of policies (X^{L},X^{R}) such that (i) X^{L} maximizes party L's expected utility given X^{R}; and (ii) X^{R} maximizes party R's expected utility, given X^{L}. Let us first determine how X^{L} and X^{R} affect the probability that party R wins the elections. In line with our assumptions about parties' preferences, we assume that $X^{\mathrm{R}} \geq X^{\mathrm{L}}$. Since preferences are single peaked and policy is one-dimensional, the vote of the median voter is decisive.

The median voter casts his or her ballot for party R if X^{R} delivers higher utility than X^{L}:[7]

$$-(X^{\mathrm{R}} - \mu)^2 > -(X^{\mathrm{L}} - \mu)^2. \quad (6)$$

Party R thus wins the elections if:

$$\mu > \frac{1}{2}(X^{\mathrm{R}} + X^{\mathrm{L}}). \quad (7)$$

Eq. (7) shows that the party whose policy is closest to the median voter's bliss point wins the elections. Note that Eqs. (6) and (7) hold under both interpretations of μ. The

[4] Another interpretation, which we owe to one of the referees, is that parties are uncertain about a set of voters including the median.

[5] The assumption that μ is the same for all voters is extreme, especially against the background that parties do not know μ when choosing X^{L} and X^{R}. However, this assumption is not crucial for our results. What matters is that parties are uncertain about the median voter's bliss point.

[6] Of course we are aware that the results presented below are well-known. This section should be regarded as a first step to the welfare analysis.

[7] We assume that if the median voter is indifferent between party L and R, a coin is tossed to decide the elections.

implication is that the source of uncertainty about the median voter preferences is not important for endogenous parties' platforms. Since parties do not know μ when choosing their policies, the election outcome is uncertain. The probability that party R wins the elections is equal to:

$$Pr\left[\mu > \frac{1}{2}(X^{R}+X^{L})\right] = \frac{1}{2z}\left[z - \frac{1}{2}(X^{R}+X^{L})\right]. \tag{8}$$

Eq. (8) reflects a well-known property of probabilistic voting models (Wittman, 1977, 1983; Calvert, 1985; Alesina, 1988). The probability that a party wins the elections is a continuous function of X^{L} and X^{R}. Ruling out corner solutions, party R decreases its chances of winning the elections by increasing X^{R}. Likewise, an increase in X^{L} decreases party R's probability of winning the elections. Thus, if one party moves its platform toward that of the other party, it increases its chances of winning the elections.

When choosing X^{R}, party R maximizes:

$$-\frac{1}{2z}\left[z - \frac{1}{2}(X^{R}+X^{L})\right](X^{R}-\theta^{R})^{2} - \frac{1}{2z}\left[z + \frac{1}{2}(X^{R}+X^{L})\right](X^{L}-\theta^{R})^{2} + \lambda\frac{1}{2z}\left[z - \frac{1}{2}(X^{R}+X^{L})\right] \tag{9}$$

with respect to X^{R}, yielding:

$$\frac{1}{4z}\left[(X^{R}-\theta^{R})^{2} - (X^{L}-\theta^{R})^{2} - \lambda\right] - \frac{1}{z}\left[z - \frac{1}{2}(X^{R}+X^{L})\right](X^{R}-\theta^{R}) = 0. \tag{10}$$

An analogous equation can be derived for party L. Since we have a perfect symmetric model, in equilibrium, both parties choose opposite platforms: $X^{L} = -X^{R}$. From Eq. (10), it directly follows that

$$X^{R} = -X^{L} = \frac{4z\theta^{R} - \lambda}{4\theta^{R} + 4z} \tag{11}$$

if $\lambda < 4z\theta^{R}$ and $X^{R} = 0$ if $\lambda \geq 4z\theta^{R}$. From Eq. (11), it is easy to show that $\frac{\partial X^{R}}{\partial z} \geq 0$, $\frac{\partial X^{R}}{\partial \lambda} \leq 0$ and $\frac{\partial X^{R}}{\partial \theta^{R}} \geq 0$. Thus, a higher degree of uncertainty about voters' preferences increases policy divergence. Moreover, policy divergence is inversely related to the rents parties receive from holding office. These results are common in probabilistic voting models, in which parties have different preferences over policy outcomes.

4. The optimal degree of policy divergence

This section analyzes the equilibrium of our electoral model from a normative point of view. More specifically, we address the question: what is the optimal degree of policy divergence from voter i's point of view, given that the political parties do not know μ when choosing X^{L} and X^{R}? Our point of departure is a voter i who anticipates that parties will choose platforms according to Eq. (11). Moreover, voter i anticipates that party R (L) will win the elections if $\mu>0$ ($\mu<0$). We let voter i determine θ^R (and thereby θ^L as $\theta^L=-\theta^R$). When selecting θ^R, voter i does not know the realization of μ.

4.1. Unknown identity of the median voter

In this subsection, we assume that the preferences of voters are stable, but the identity of the median voter is unknown. Using Eq. (4), we can write voter i's expected utility as:

$$EU_i = -\frac{1}{2}[X^R - \theta^i]^2 - \frac{1}{2}[X^L - \theta^i]^2. \tag{12}$$

Substituting Eq. (11) into Eq. (12) gives voter i's expected utility as a function of θ^R. Maximizing the resulting expression with respect to θ^R yields:

$$\theta^R = -\theta^L = \frac{\lambda}{4z}. \tag{13}$$

Using Eq. (11), it is easy to see that Eq. (13) implies $X^R=-X^L=0$. Thus, in line with Persson and Tabellini (2000, p.100), risk-averse voters have preferences for a "stable policy in the middle rather than a policy that shifts back and forth as governments change".

4.2. Unobserved shocks to the voters' preferences

In this subsection, we assume that voters' preferences are subject to shocks that are unobserved by the parties. Using Eq. (5), we can write the expected utility of voter i facing a possibility of a shock μ to his or her preferences as:

$$EU_i = -\frac{1}{2}E\{[X^R - (\theta^i + \mu)]^2 \mid \mu > 0\} - \frac{1}{2}E\{[X^L - (\theta^i + \mu)]^2 \mid \mu < 0\}. \tag{14}$$

Substituting Eq. (11) into Eq. (14) and calculating the conditional expectations, we can express voter i's expected utility as a function of θ^R and θ^L. This function is maximized at

$$\theta^R = -\theta^L = \frac{2z^2 + \lambda}{2z} \tag{15}$$

(see Appendix A for the calculations). Using Eq. (11), it is easy to show that Eq. (15) implies $X^R=-X^L=(1/2)z$. Each voter thus prefers some degree of policy divergence to complete policy convergence. The optimal degree of policy divergence (X^R-X^L) equals z. The intuition behind this result is straightforward. In the model under consideration, political parties are uncertain about voters' preferences. The implication is that parties' policies might be based on a wrong perception of voters' preferences. Policy divergence offers voters a choice. This choice enables voters to correct partially for parties' wrong perception.

We have assumed that parties can commit themselves to implement, if elected, their announced policy. Alesina (1988) argues that when parties are sufficiently impatient, policy commitments are not credible. As a consequence, each party chooses its ideal policy if elected ($X^L=\theta^L$ and $X^R=\theta^R$). It is easy to see that the assumption that parties cannot commit themselves does not affect our results. The optimal degree of policy divergence $X^R - X^L$ remains 0 when the identity of the median voter is uncertain and is z when voters' preferences are subject to shocks.

5. Conclusion

The view that full convergence of policy platforms in a two-party system is Pareto-optimal, is widely accepted in the literature on electoral politics. In this paper, we have used a simple model of electoral competition in which probabilistic voting is the result of uncertainty about the preferences of the median voter. We have shown that the welfare implications of policy convergence depend crucially on the source of the uncertainty. When voters' preferences are subject to shocks that are not observed by parties, voters may prefer some degree of policy divergence. The intuition is that policy divergence enables voters to correct policies that are based on a wrong perception of their preferences.

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Appendix A

To derive Eq. (15), first rewrite Eq. (14) as:

$$\begin{aligned}&-\frac{1}{2}\{(X^R)^2 - 2X^R(\theta^i + E[\mu\,|\,\mu > 0]) + (\theta^i)^2 + \theta^i E[\mu\,|\,\mu > 0] + E[\mu^2\,|\,\mu > 0]\}\\ &\quad -\frac{1}{2}\{(X^R)^2 - 2X^R(\theta^i + E[\mu\,|\,\mu < 0]) + (\theta^i)^2 + \theta^i E[\mu\,|\,\mu < 0] + E[\mu^2\,|\,\mu < 0]\}.\end{aligned} \tag{A1}$$

The conditional expectations are:

$$E[\mu\,|\,\mu > 0] = -E[\mu\,|\,\mu < 0] = \frac{z}{2}, \tag{A2}$$

$$E[\mu^2\,|\,\mu > 0] = E[\mu^2\,|\,\mu < 0] = \frac{z^2}{3}. \tag{A3}$$

Substituting Eqs. (11), (A2), (A3) into Eq. (A1) and maximizing the resulting expression with respect to θ^R, yields Eq. (15).

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