VOTING CYCLES IN A COMPUTATIONAL ELECTORAL COMPETITION MODEL WITH ENDOGENOUS INTEREST GROUPS

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Outline:

1. Motivation
2. A computational spatial competition model with interest groups
3. Mean dynamics and voting cycles
4. Discussion

MOTIVATION

Standard interest group models assume that:

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In **this presentation** we assume that:

1. Interest groups form *endogenously* – driven by dissatisfaction;
2. Interest groups influence elections also through coordination of *voting behavior*.

SPATIAL COMPETITION MODELS

Voters and political candidates are represented by points in a multidimensional issue space (Downs, 1957)

Assumptions:

- Each voter votes for the candidate "closest" to the voter's ideal point.
- Candidates know the distribution of voter preferences and select the proposal that attracts the most votes.

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Main results:

1. One–dimensional issue space: *Convergence* to median voter.
2. Multi–dimensional issue space: Election outcomes may keep on *fluctuating* – 'chaos' (e.g. McKelvey 1976, 1979; Schofield, 1978).

Relaxed assumptions:

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Approach: Political parties are incompletely informed and boundedly rational. They search *adaptively* for better (multi–dimensional) platforms and test these by using opinion polls.

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Result: Convergence to center of policy space ('median'): 'Chaos' disappears.

A COMPUTATIONAL SPATIAL COMPETITION MODEL

Basic assumptions

- Two dimensional issue-space (two issues): $\mathcal{X} = \{1, 2, \ldots, K\} \times \{1, 2, \ldots, K\}$.
- Two (office-motivated) political candidates: *incumbent* and *challenger*. Policy platforms: $y, z \in \mathcal{X}$. Platform of incumbent is inherited from previous election.
- N voters. Voters preferences are represented by utility function (*weighted Euclidean distance*)

$$u_j(y) = -s_{j1}(x_{j1} - y_1)^2 - s_{j2}(x_{j2} - y_2)^2.$$

  - *Ideal points* x_j uniformly distributed over $\mathcal{X}$.
  - *Strengths* s_{j1} and s_{j2} IID on $\mathcal{S} = \{\underline{s}, \ldots, \overline{s}\}$, with $0 \leq \underline{s} < \overline{s} \leq 1$.

Typically equilibrium point exists.

Simulations (from STvW, *Public Choice*, 2006)

Design: $K = 5$, $\mathcal{S} = \left\{0, \frac{1}{2}, 1\right\}$, $N = 301$ and poll is 10% of population.

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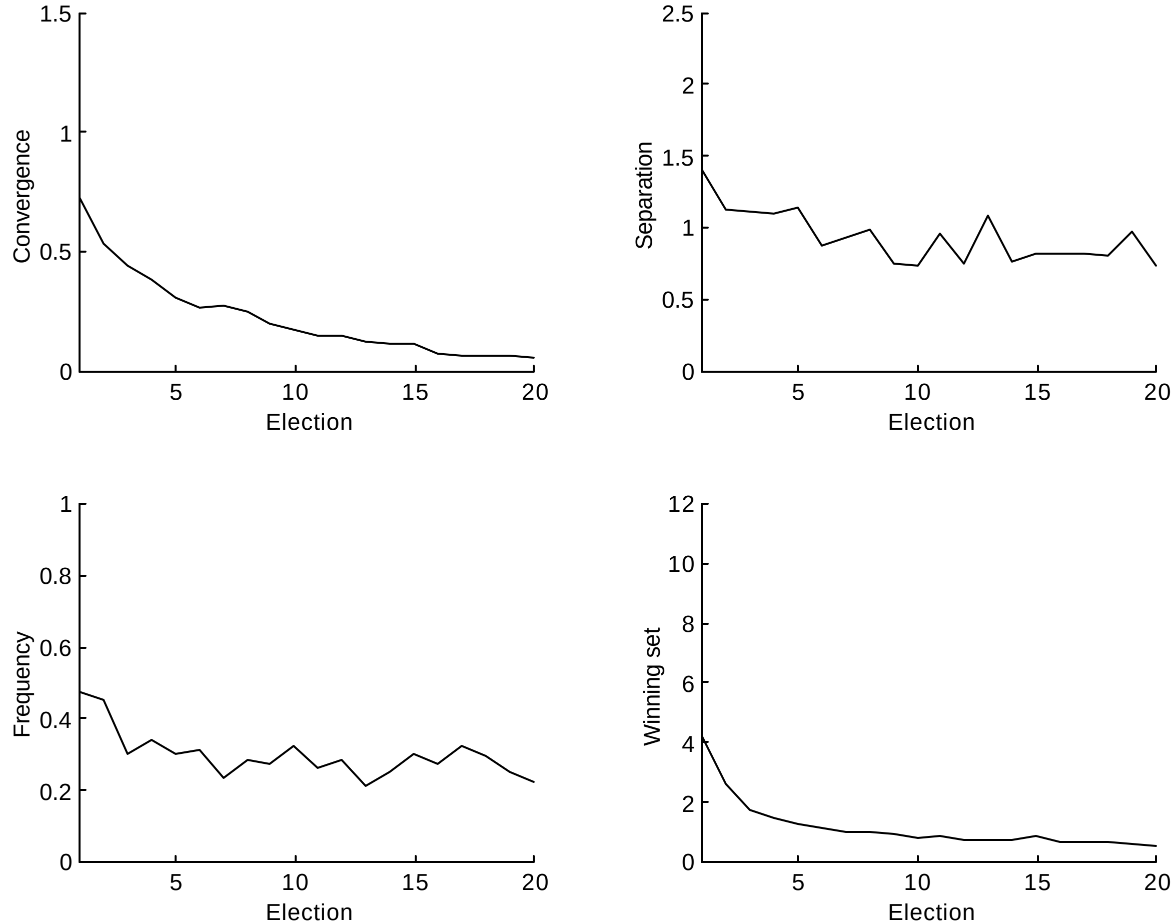
We are interested in:

- *Convergence*: distance between winning platform and the center.
- *Separation*: distance between platforms of challenger and incumbent.
- *Frequency*: percentage of victories for the challenger.
- *Winning set*: number of elements of the issue space defeating the incumbent.



Some measures for the benchmark model. (Averaged over 100 trials.)

Interest groups – *Membership decisions*

Interest groups emerge from individuals who share common interests and are dissatisfied about current government policy.

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1. Voters are sequentially drawn to decide on membership.
2. Each voter decides on membership for issue group based upon
   (a) The incumbent's position: "*Negative voting*" (Kernell, 1977, Lau, 1982).
   (b) The strengths the voter attaches to the issues.
   (c) The number of other interest group members.

Interest groups – *Coordination of voting behavior and campaign contributions*

Voting behavior: Interest group member j (on first issue) votes for y instead of z when

$$\begin{cases} |y_1 - x_{j1}| < |z_1 - x_{j1}| \\ |y_1 - x_{j1}| = |z_1 - x_{j1}| \quad \text{and } |y_2 - x_{j2}| < |z_2 - x_{j2}| \,. \end{cases}$$

Why would interest group members vote according to interest group's position?

1. To be able to exert some *influence* on the election outcome.
2. *Identification* and *incomplete information*.
3. Interest group makes issue more *salient*.

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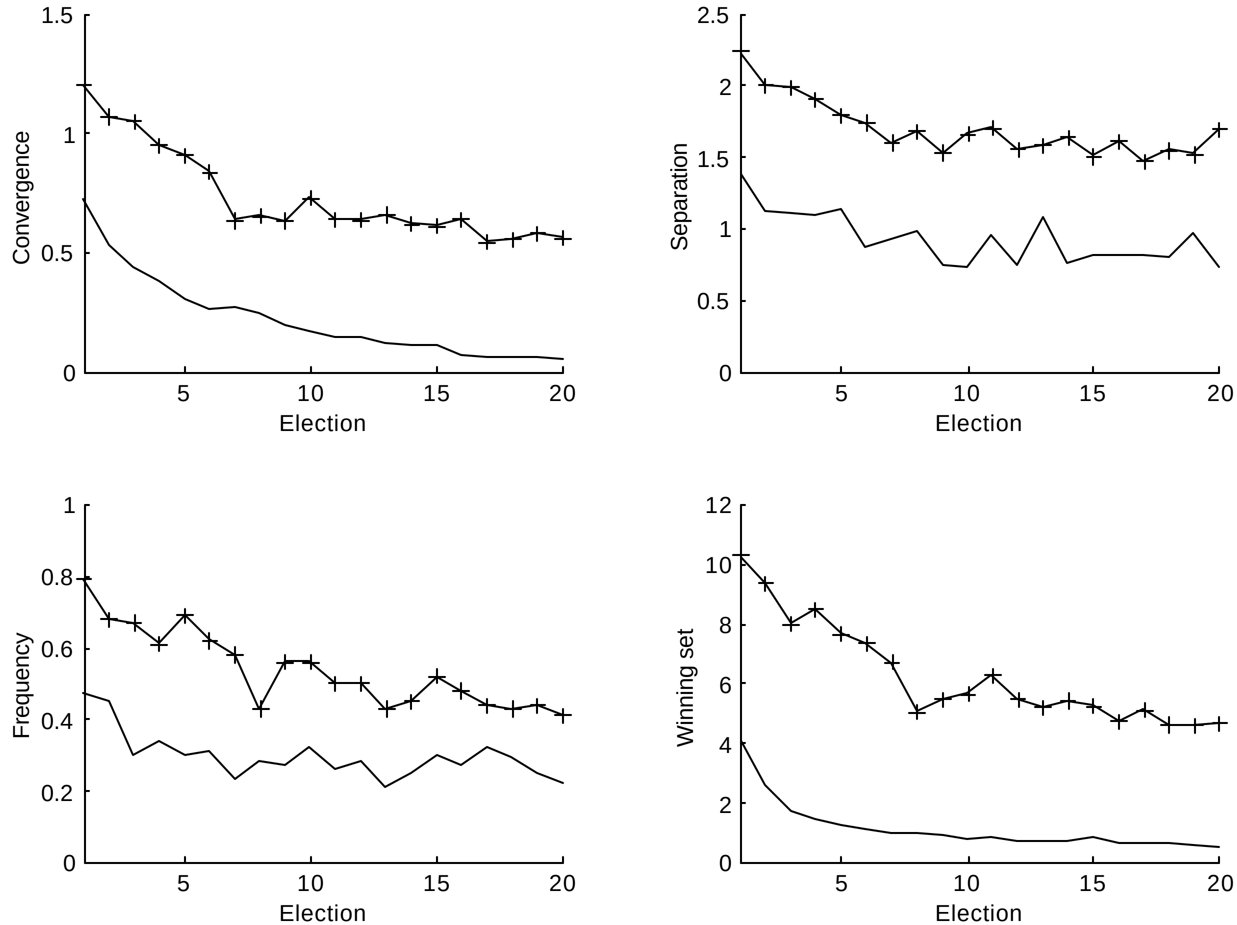
Campaign contributions: The most successful (that is, largest) interest groups finance (conditional) polls for the challenger.



$-$: benchmark model, $+$: interest group model. (Averaged over 100 trials.)

MEAN DYNAMICS – *Notation and definitions*

$y^{t-1} \in \mathcal{X}$ winning platform in election $t-1$ (incumbent for election t).

State space: $U_R = \left\{ x \in \mathcal{X} : \|x - C\|^2 = R^2 \right\}$, $R = 0, 1, \sqrt{2}, \ldots \sqrt{2}K$.

P_r : transition matrix, with $\Pr\left(y^{t+1} \in U_j \mid y^t \in U_i\right)$ as the $(i, j)'$th element (r polls).

Mean dynamics: $\pi_t = \pi_0 (P_r)^t$, with π_0 distribution of y^0.

Distance: $E(\|y^t - C\|) = \sum_{R \in \mathcal{R}} R \pi_t$.

Probability challenger wins election t: $\pi_t w$, with $w_R = \Pr\left(\text{chall. wins} \mid y^{t-1} \in U_R\right)$.

Computations for the benchmark model

- $K = 5$
- $\mathcal{S} = \left\{0, \frac{1}{2}, 1\right\}$, $\Pr(s_{ji} = 0) = \Pr(s_{ji} = 1) = \frac{1}{4}$ and $\Pr\left(s_{ji} = \frac{1}{2}\right) = \frac{1}{2}$.
- y^0 drawn from $\pi_0 = \left[\frac{1}{25}, \frac{4}{25}, \frac{4}{25}, \frac{4}{25}, \frac{8}{25}, \frac{4}{25}\right]$.

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For two random polls ($r = 2$) P_2 and $w_{(2)}$ can be computed as

$$
\begin{aligned}
P_2 &= \begin{pmatrix}
1.000 & 0 & 0 & 0 & 0 & 0 \\
0.080 & 0.920 & 0 & 0 & 0 & 0 \\
0.080 & 0.287 & 0.633 & 0 & 0 & 0 \\
0.077 & 0.270 & 0.253 & 0.400 & 0 & 0 \\
0.073 & 0.273 & 0.248 & 0.175 & 0.230 & 0 \\
0.070 & 0.253 & 0.237 & 0.147 & 0.273 & 0.020
\end{pmatrix}, \\
w_{(2)} &= \begin{pmatrix} 0.500 & 0.540 & 0.683 & 0.800 & 0.908 & 0.990 \end{pmatrix}'
\end{aligned}
$$

P_{10} and $w_{(10)}$ (ten random polls) can be computed as

$$P_{10} = \begin{pmatrix} 1.000 & 0 & 0 & 0 & 0 & 0 \\ 0.400 & 0.600 & 0 & 0 & 0 & 0 \\ 0.400 & 0.543 & 0.057 & 0 & 0 & 0 \\ 0.250 & 0.495 & 0.253 & 0.002 & 0 & 0 \\ 0.152 & 0.533 & 0.308 & 0.006 & 0.001 & 0 \\ 0.090 & 0.407 & 0.422 & 0.001 & 0.080 & 0 \end{pmatrix},$$

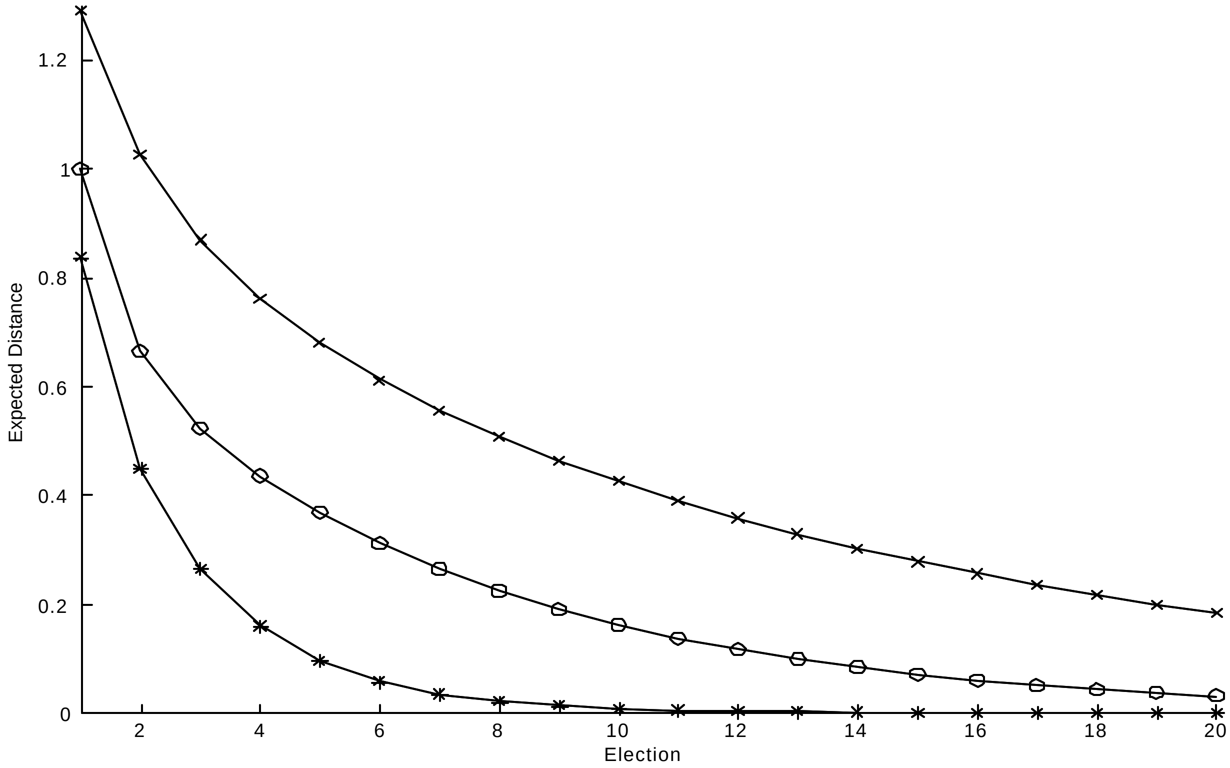
$$w_{(10)} = \begin{pmatrix} 0.500 & 0.700 & 0.972 & 0.999 & 1.000 & 1.000 \end{pmatrix}'$$

Interest group model – unconditional polling

$$P^I_{10^u} = \begin{pmatrix} 1.000 & 0 & 0 & 0 & 0 & 0 \\ 0.152 & 0.848 & 0 & 0 & 0 & 0 \\ 0.400 & 0.425 & 0.176 & 0 & 0 & 0 \\ 0.007 & 0.443 & 0.407 & 0.142 & 0 & 0 \\ 0.152 & 0.444 & 0.307 & 0.007 & 0.090 & 0 \\ 0.028 & 0.407 & 0.542 & 0.000 & 0.023 & 0 \end{pmatrix},$$

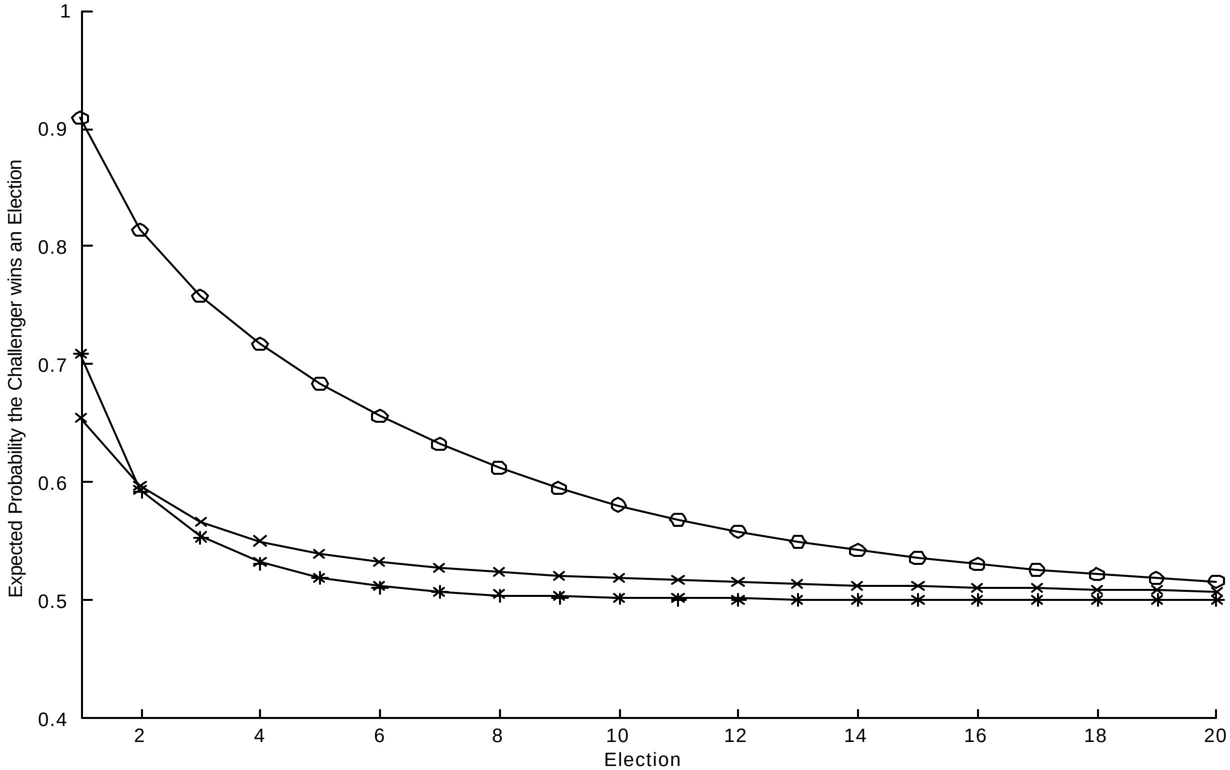
$$w^I_{(10^u)} = \begin{pmatrix} 0.500 & 0.999 & 1.000 & 1.000 & 1.000 & 1.000 \end{pmatrix}'$$

Distance between incumbent and center



$\times$: benchmark model with 2 polls, $\circ$: interest group model with 10 polls, $*$: benchmark model with 10 polls.

Frequency with which challenger wins



$\times$: benchmark model with 2 polls, $\circ$: interest group model with 10 polls, $*$: benchmark model with 10 polls.

Interest group model – conditional polling

Interest group offers funds and information to the challenger conditional on running a poll in policy position coinciding with the interest group's position on the relevant issue.

Number of random polls: $r_1 = 2$. Number of conditional polls: $r_2 = 8$.

$$P^I_{10^c} = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0.882 & 0.118 & 0 & 0 & 0 \end{pmatrix}, w^I_{10^c} = \begin{pmatrix} 0.5 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{pmatrix}$$

Results: Two persistent states: U_0 (center) and U_1 (**voting cycles**). Result holds for general K and depends on the distribution of strengths.

DISCUSSION

Interest groups may:

- Slow down convergence of political platforms;
- Increase the frequency with which challengers win elections.

Moreover, the *mean dynamics approach* shows that interest groups may lead to **voting cycles** even if an equilibrium point exists.

Main intuition: due to *negative voting*, the presence of interest groups increases the *winning set* for the challenger.