Conditional Retrospective Voting in Large Elections

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Pittsburgh, October 12, 2013

Two distinct approaches to modeling voting behavior

economics literature

- ▷ portrays voters as sophisticated individuals
- ▷ well-defined preferences
- ▷ solve complicated signal-extraction problems
- ▷ have correct expectations, even about counterfactuals

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We offer an **equilibrium model of retrospective voting** (see also Bendor, Diermeier, Kumar, Siegel, and Ting for a non-equilibrium, adaptive model of voting behavior)

Retrospective voting: Example

Suppose voter knows $u(B) = 1$ but needs to learn A's performance.

time	signal	vote	election outcome	observed payoff
1	**a**	A	A	**0**
2	**a**	B	A	**2**
3	**a**	A	B	1
4	**b**	B	A	0
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Voting behavior at $t = 8$ after observing signal a:

$$\frac{0+2+2}{3} > 1 = u(B) \quad \Rightarrow \quad \text{vote for } A$$

Novel feature: Sample selection bias

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1	**a**	A	A	**0**	
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Retrospective voting + private information $\Rightarrow$ biased learning + voting

Our contributions in this paper

- Propose a new equilibrium concept to capture **retrospective voting** with **private information** under a **large electorate**
  - formally capture biased learning
- Explore the **implications** of retrospective voting

Standard voting environment

- Election: 2 alternatives (e.g., parties) A and B
- State of the world $\omega \in \Omega = [-1, 1]$, distribution G
- Continuum of players
  - observe conditionally i.i.d. private signals $\mathbb{S}$ with precision $q(\cdot \mid \omega)$
  - simultaneous voting
- Election outcome: A elected iff vote share of $A \geq \rho \in (0, 1)$
- Payoffs $u(A, \omega) \uparrow$ in ω, $u(B, \omega) \downarrow$ in ω
- In the paper, we allow for heterogeneous info/preferences
- Assumptions: monotone utility + MLRP + technical

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Definition

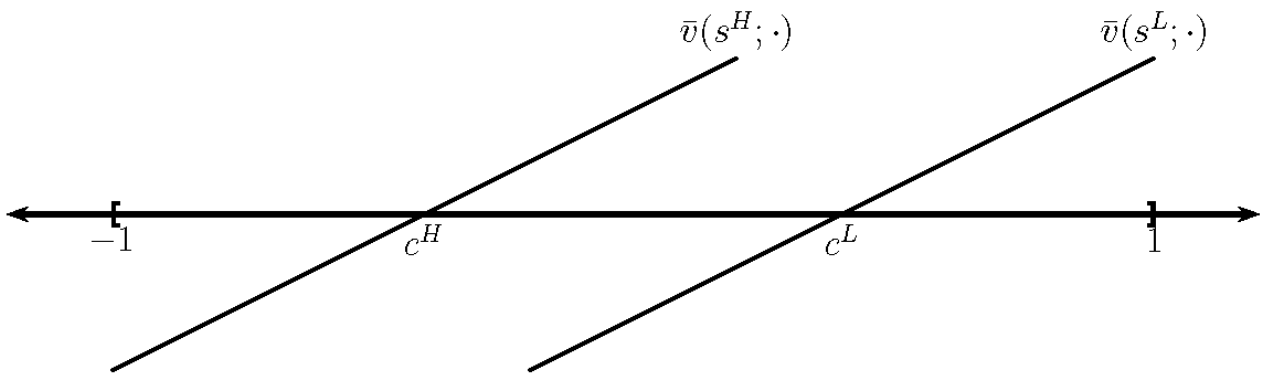
A retrospective voting equilibrium is a strategy σ^* and an election cutoff c^* such that (i) σ^* is optimal given c^*, and (ii) c^* is an election cutoff given σ^*.

Example

- $\omega \sim U[-1, 1]$
- $u(A, \omega) = \omega$, $u(B, \omega) = -\omega$, so first-best cutoff is $c^{FB} = 0$
- Binary signals $\{s^L, s^H\}$
  - precision $q(s^H \mid \omega) = .5 + r\omega$, where $r \in (0, .5]$

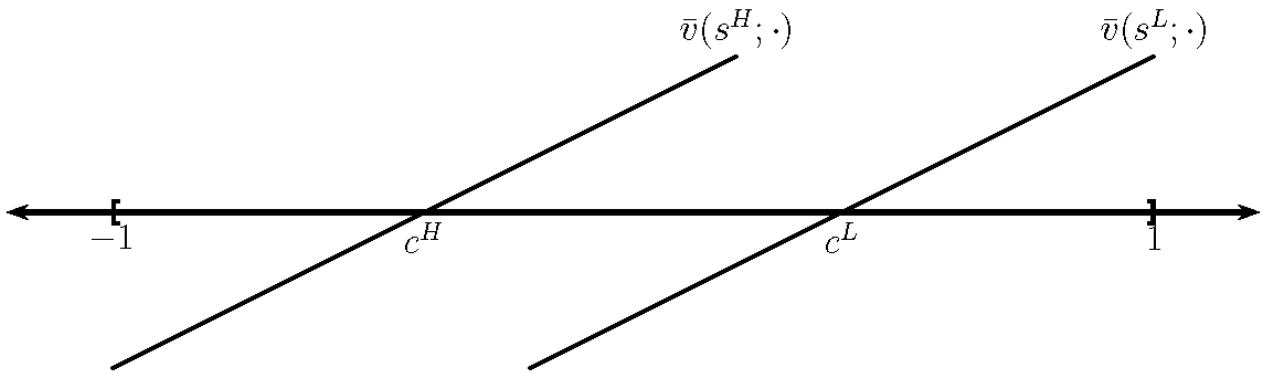
Finding an equilibrium

Step 1. Compute difference in expectations $v(s^L; c)$ and $v(s^H; c)$



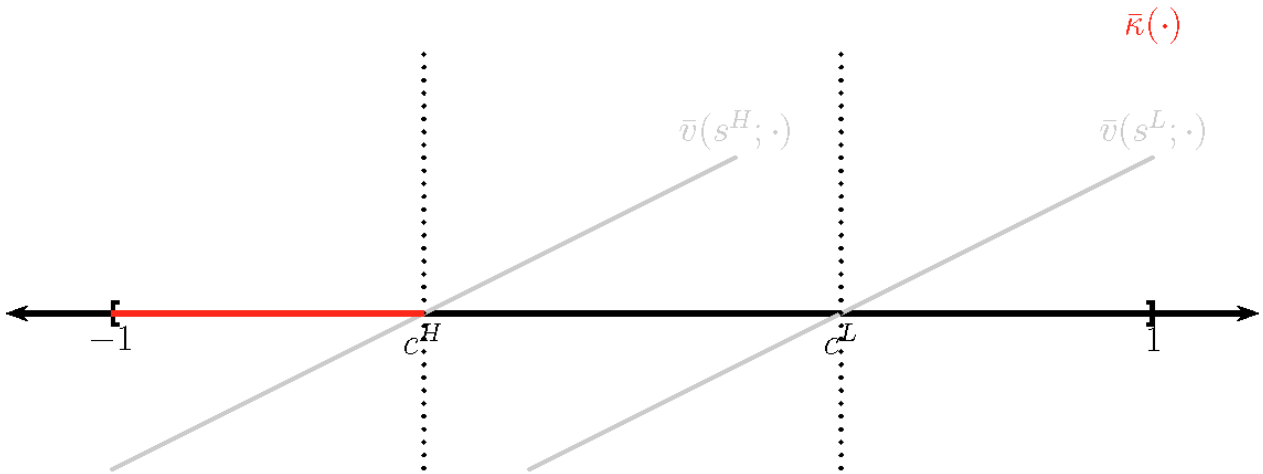
Finding an equilibrium

Step 2. Find "personal cutoffs" c^H and c^L that make voters indifferent, i.e., $v(s^j; c^j) = 0$, $j = L, H$.



Finding an equilibrium

Step 3. Compute share voting for A for each possible election cutoff: $\bar{\kappa}$



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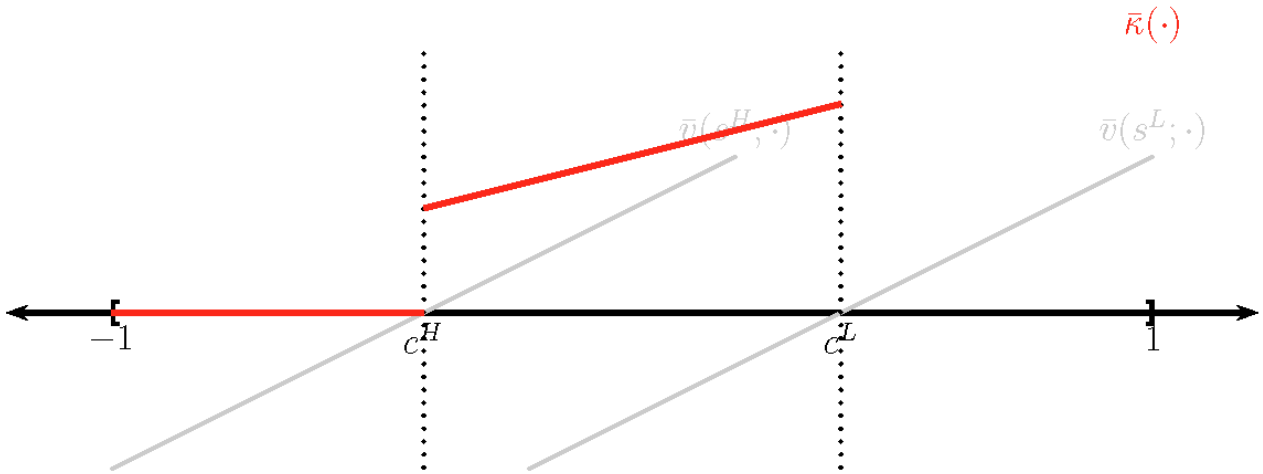

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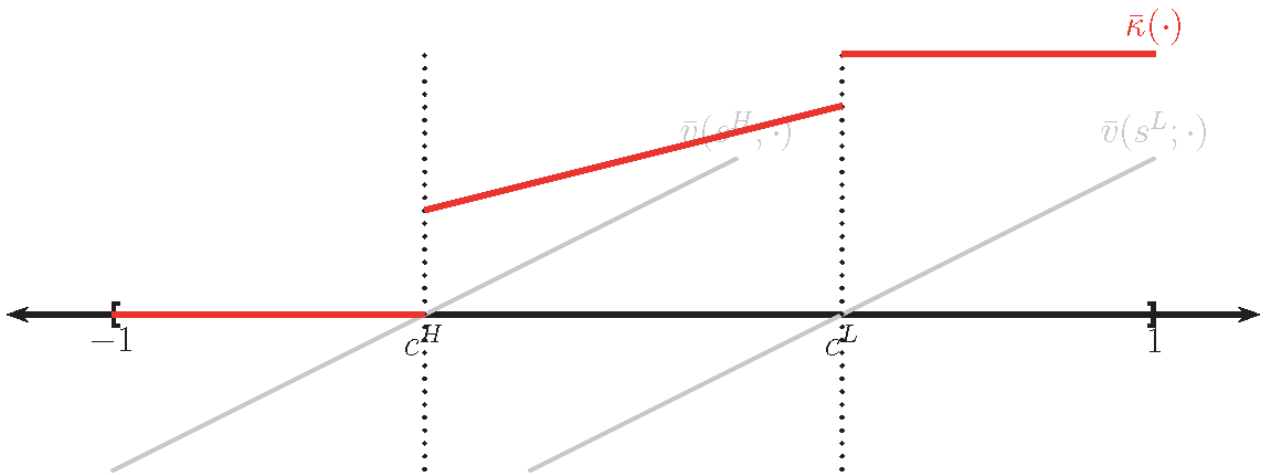
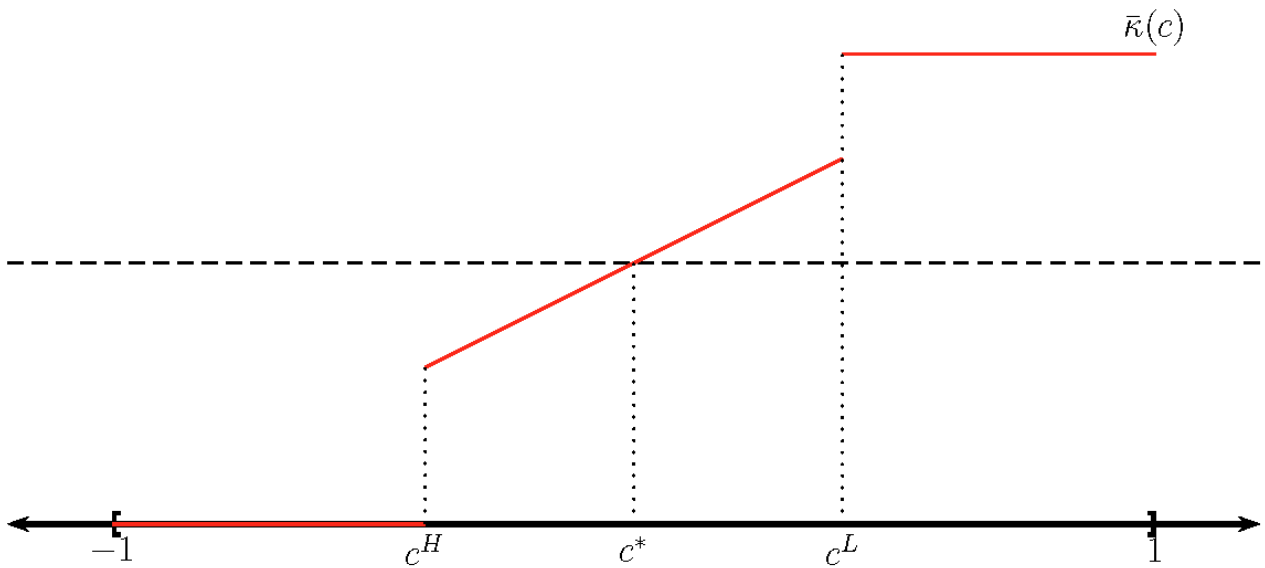
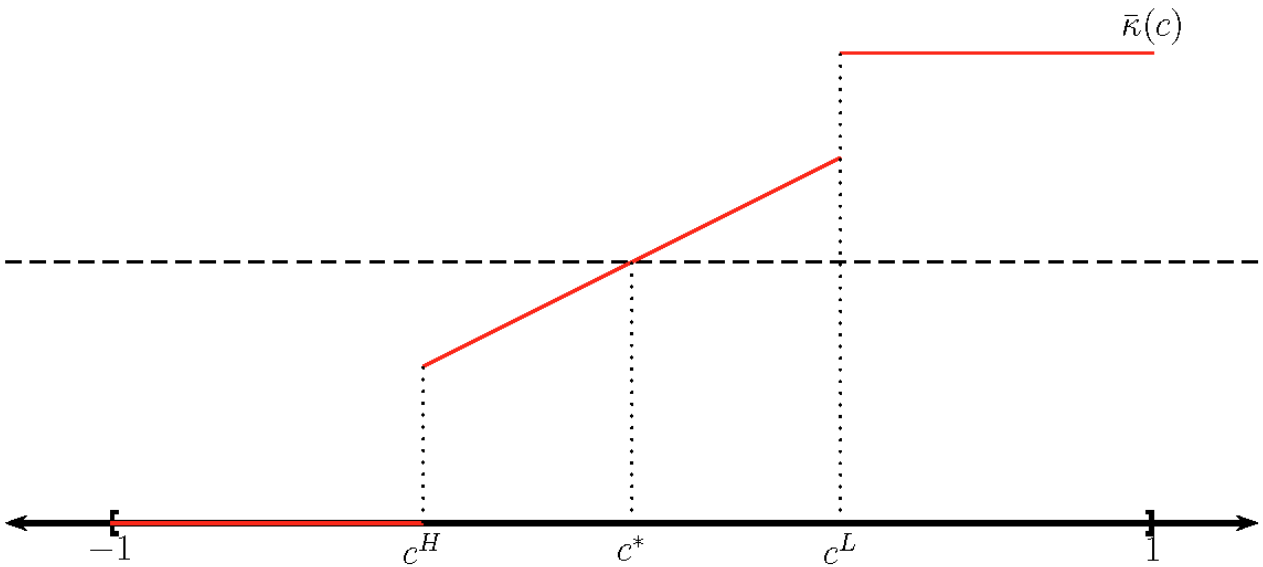


Finding an equilibrium

Step 4. Intersect vote-share for A with electoral rule to find equilibrium cutoff c^*



Compare to Nash eqm & sincere voting



Implications of retrospective voting derived in the paper

- Information not efficiently aggregated in general
  - Most attractive alternative occasionally chosen in wrong states
  - But there is a limit to how bad elections can perform
  - Information precision and electoral rules matter
  - But not always the case that more info improves welfare
- Value of risky alternative is overestimated
  - Justifies conservatism; supermajority rules
- Cannot infer party quality from observed performance
  - Elections might be very valuable even if parties are observed to perform similarly
- Composition effects: partisanship depends on own+others' preferences
  - Voting in local vs national elections can be different
- Political competition: parties have incentives to polarize
  - Polarization can increase welfare