Inferring Strategic Voting
Kawai and Watanabe(2011)

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Outline

- Introduction
- Model
- Data
- Empirical Analysis
- Results and Counterfactual Experiment
- Conclusion

Introduction

Main question solved in this paper:

- Can we identify the existence and fraction of strategic voters?

Empirical methodologies used in the past studies:

- Aggregate regression
- Self-reporting survey
- Direct measurement
- Laboratory Experiment

Introduction

Definition

- Sincere voting: voting according to preferences
- Strategic voting: voting conditioning on pivotality
- Misaligned voting: voting for a candidate other than the most-preferred
- Pivotality: the state of having the decisive vote

the set of misaligned voters is only a subset of the set of strategic voters.

Model

Environment:

- Plural-rule election
- *K* candidates for one seat in one didtrict
- *M* municipalities in an electoral district

Voter's utility function

$$u_{nk} = u(x_n, z_k) + \xi_{km} + \varepsilon_{nk}$$

- x_n :Voter *n*' s characteristic
- z_k :Candidate *k* 's characteristics
- ξ_{km} :Candidate *k* 's shock on municipality *m*
- ε_{nk} :Voter *n*'s preference shock

Model

Voter's strategies:

- Sincere: vote for candidate *k* IFF $u_{nk} \geq u_{nl} \forall l$
- Strategic: vote for candidate *k* IFF $\overline{u_{nk}(T_n)} \geq \overline{u_{nl}(T_n)} \forall l$

Expected utility from voting for candidate *k*:

$$\overline{u_{nk}}(T_n) = \frac{1}{2} \sum_{l \in \{1..K\}} T_{n,kl}(u_{nk} - u_{nl})$$

- $T_{n,kl}$: Voter *n* 's belief that his vote would be pivotal: belief that candidate *k* and *l* would be tied for the first place or that *k* will be one vote behind.

Model

Further assumptions

- Beliefs are common across all voters in the same district (Beliefs over tie probabilities are common across the same district)
- Denote the type of voter *n* in municipality *m* by a random variable:

$$\alpha_{nm} = \begin{cases} 0 \text{ if voter } n \text{ is sincere} \\ 1 \text{ if voter } n \text{ is strategic} \end{cases}$$

- The probability that voter *n* in municipality *m* is a strategic voter(α_m)is drawn iid from a conditional distribution $F_\alpha(\cdot \mid w)$ where *w* reflects the closeness based on election forecasts.

Model

Aggregating vote share:

$$V_{k,m}^{SIN} = \frac{\sum_{n=1}^{N_m}(1-\alpha_{nm})\cdot 1\{u_{nk} \geq u_{nl}, \forall l)}{\sum_{n=1}^{N_m}(1-\alpha_{nm})}$$

$$V_{k,m}^{SIR}(T) = \frac{\sum_{n=1}^{N_m}\alpha_{nm}\cdot 1\{\overline{u_{nk}} \geq \overline{u_{lk}}, \forall l)}{\sum_{n=1}^{N_m}\alpha_{nm}}$$

$$V_{k,m}(T) = \frac{\sum_{n=1}^{N_m}\alpha_{nm}\cdot V_{k,m}^{SIR}(T)}{N_m} + \frac{\sum_{n=1}^{N_m}(1-\alpha_{nm})\cdot V_{k,m}^{SIN}(T)}{N_m}$$

Data

General information

- Source: Japanese House Representatives election
- Vote share and candidate characteristics (*from ATES*)
- Demographic information(*from Social and Demographic Statistics of Japan*)
- Data selection criteria:
    - 3 or 4 candidates
    - No recent mergers
    - Minimum of 2 municipalities

Data

	mean	st. dev.	min	max	# obs
# of municipalities per district	9.23	7.27	2	36	159
3-candidate district	8.72	7.03	2	36	144
4-candidate district	14.13	8.02	3	36	15
winner's vote share (%)	51.72	6.83	28.98	73.62	159
3-candidate district	52.90	5.70	36.03	73.62	144
4-candidate district	40.46	6.69	28.98	55.89	15
winning margin (%)	13.53	10.23	0.06	53.92	159
3-candidate district	14.05	10.17	0.17	53.92	144
4-candidate district	8.50	9.73	0.06	35.50	15
margin between 2nd and 3rd (%)	28.51	9.67	0.00	43.32	159
3-candidate district	30.39	7.65	0.00	43.32	144
4-candidate district	10.45	8.51	0.57	23.32	15
pre-election forecast on closeness	2.33	0.81	1	4	159
3-candidate district	2.36	0.82	1	4	144
4-candidate district	2.07	0.59	1.5	3.5	15

Data

vote share – JCP	7.62	2.72	2.77	17.02	154
vote share – DPJ	38.56	8.80	10.78	60.10	159
vote share – LDP	49.66	8.90	23.19	73.62	159
vote share – YUS	34.95	9.10	14.50	49.58	20
ideology – JCP	1.97	0.36	1	2.75	154
ideology – DPJ	3.10	0.60	1	4.50	159
ideology – LDP	3.12	0.61	1.25	4.67	159
ideology – YUS	2.55	0.45	1.25	3.25	20

The situation might be very different in 4-candidate districts:

- Voters may have beliefs in **three way ties** rather than **two-way ties**.
- Since the prediction would be very **ambiguous** in a 4-candidate district, the common belief might be violated.

Empirical Analysis

Specification of the model

$$u_{nk} = u(x_n, z_k, \theta^{PREF}) + \xi_{km} + \varepsilon_{nk} = -(\theta^{ID} x_n - \theta^{pos} z_k{}^{POS})^2 + \theta^{QLTY} z_{km}^{QLTY} + \xi_{km} + \varepsilon_{nk}$$

voters' ideology is assumed to be a function of demographics

- x_n :voter characteristics
- $z_{km} = \{z_k^{POS}, z_{km}^{QLTY}\}$:Candidate characteristics

  z_k^{POS} :Ideological characteristics

  z_{km}^{QLTY} :Non-ideological characteristics
- θ^{PREF} :vector of preference parameters

Empirical analysis

Partial Identification of preference parameters

- Two kinds of restrictions:

Restriction (I): voters do not vote for their least-preferred candidate

Restriction (II): common belief within one district.

- With two restrictions, the parameters can only be partially identified.

Partial Identification of the fraction of the strategic voters

- Vary the identified set of θ^{PREF} to trace out the identified set of the parameters that determine the extent of strategic voting
- When there is a large number of strategic voters, the actual vote share can systematically diverge from the predicted outcome.

Empirical analysis

Parameters estimated

- θ^{PREF} :Preference parameters
- $(\theta_{\alpha 1}, \theta_{\alpha 2})$:Parameters that determine the distribution of strategic voters

Estimation steps

- For some district, regress the vote share data of candidate *k* in each municipality on the demographic data to obtain coefficients.
- Fix preference parameters, beliefs, fraction of strategic voters and municipality shocks; compute the simulated vote share.
- Regress the simulated vote share on demographic data to obtain regression coefficients.
- Vary beliefs to obtain minimum and maximum for the coefficients.
- Integrate out the fraction of strategic voters and municipality shocks
- Find out the moment inequality and apply Pakes, Porter, Ho, and Ishii(2007)

Main Results

Parameter estimates

Parameter	Confidence Interval
θ_1^{const}	$[-0.556, -0.543]$
θ_1^{income}	$[-0.028, -0.025]$
$\theta_1^{educatoin}$	$[-0.109, -0.104]$
$\theta_1^{above65}$	$[0.136, 0.141]$
θ^{YUS}	$[-0.701, -0.695]$
θ^{JCP}	$[-2.495, -2.482]$
θ^{DPJ}	$[-1.975, -1.969]$
θ_2^{const}	$[2.629, 2.635]$
θ_2^{income}	$[-0.637, -0.625]$
$\theta_2^{education}$	$[0.339, 0.349]$
$\theta_2^{above65}$	$[-0.056, -0.052]$

Voters with lower income, fewer years of schooling prefer LDP, YUS.

Voters with lower income, longer years of schooling prefer pro-market candidates

ideology – JCP	1.97	0.36	1	2.75	154
ideology – DPJ	3.10	0.60	1	4.50	159
ideology – LDP	3.12	0.61	1.25	4.67	159
ideology – YUS	2.55	0.45	1.25	3.25	20

Main Results

The fraction of strategic voters and misaligned voters

- The authors estimate the fraction of strategic voters to be [63.4% ， 84.9%]
- The authors determine the fraction of misaligned voters to be [1.4%, 4.2%]

Counterfactual Experiment: Sincere voting under plurality rule

- The change in vote share is small (due to a small fraction of misaligned voter)
- Change in the number of seats is considerable (due to small winning margin)

Conclusion

- **The authors find a much larger fraction of strategic voters than in the past studies.**
- **The authors consider including abstention in the future method.**
- **My suggestions:**
    - Drop the sample of 4-candidate districts and go through the estimation again to see if there is a big difference.
    - Find more accurate indicators for individual ideologies. (i.e data from local surveys)