Comparing strategic voting incentives in plurality and instant-runoff elections

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26th April, 2019

5 Data

To assess the prevalence and distribution of strategic incentives under plurality and IRV empirically, we rely on the Comparative Study of Electoral Systems (CSES) data for a realistic set of preferences and beliefs. The dataset covers 160 surveys from xx different countries, administered shortly before or after an election.[1] We focus on the three largest parties (evaluated how?) and label them A, B, C in descending size, respectively. From each survey, we take the party like/dislike scores to approximate voters' ordinal utilities and construct their preference ranking. Let $\tilde{\mathbf{v}}$ be the vector of ballot proportions if everyone in the survey voted sincerely. Then, we assume that respondents' beliefs about the next election can be captured with a $\text{Dir}(s \times \tilde{\mathbf{v}})$ distribution. Using this set up, we can calculate the strategic incentives under either electoral system as laid out in Section 2.

We should begin with the caveat that a theory that incorporates all relevant parameters (utilities, beliefs, information, etc.) and their respective interactions would be too demanding. Instead, we intend to give our readers a broad sketch of the main theoretical implications; the subsequent presentation of results will address these and explain additional patterns in the data.

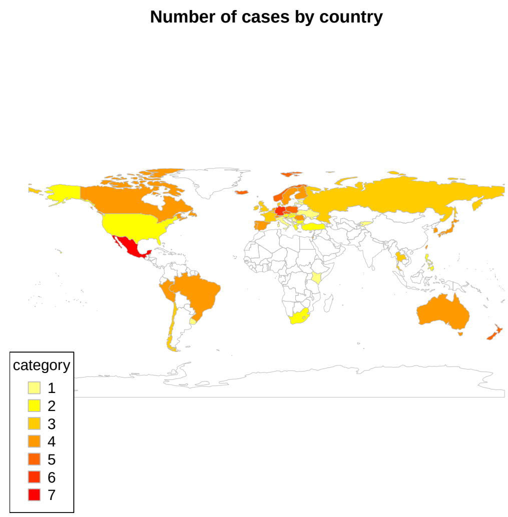

Figure 1: Cases in CSES data, by country

5.1 Summary statistics

The mean number of respondents in each case is 1384 (with a standard deviation of 539). The 160 different surveys come from xx different countries from the time between 1996 and 2016. Figure **??** maps the number of surveys in each country. (Do we need to say any more? Perhaps something about mean / sd of preference intensity and τ?)

5.2 Distribution of preferences

How different are the CSES cases from one another? Aside from the intensity of preferences, we can describe each case with the vector $\tilde{\mathbf{v}}$, where the three-item vector $(v_1 + v_2, v_3 + v_4, v_5 + v_6)$ describes the distribution of first preferences, and the three-item vector $(m_{AB} = \frac{v_1}{v_1+v_2}, m_{BA} = \frac{v_3}{v_3+v_4}, m_{CB} = \frac{v_6}{v_5+v_6})$ describes the distribution of second preferences.

To link these two distributions together and classify cases more completely, we offer the following approach. Without loss of generality, let the candidate (party) X whose first-preference voters have the most equally split second preferences, and the other two parties Y and Z. If both m_{YZ}, $m_{ZY} > 0.6$, then classify this case as *single-peaked* and denote it

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[1] Two additional cases in the survey, Belarus (20xx) and Lithuania (20xx), are dropped because no respondent specified full preferences over more than two parties.

Table 1: Distribution of preference profiles in CSES data

	A	B	C
Single-peaked (+)	18	23	9
Divided majority (-)	28	20	20
Neutral ()	5	7	3
Other ()		27	

$X+$.[2] Conversely, if both $m_{YZ}, mZY < 0.4$, then classify this case as *divided majority* and denote it $X-$.[3] If $m_{YZ}, m_{ZY} \in [0.4, 0.6]$, then classify this case as *neutral* and denote it $N(X)$. If neither of these conditions hold (because of unusual second preferences), classify it as *other* and denote it O. This completes a mutually exclusive and exhaustive set of classes determined by $\tilde{\mathbf{v}}$.

Table **??** summarises the distribution of preference classes across the CSES cases. A plurality of cases belong to the divided majority classes; however, there is also a large number of single-peaked cases, whereas neutral and others tend to be rarer. (Figure **??** plots the distribution of first preferences conditional on the classes.)

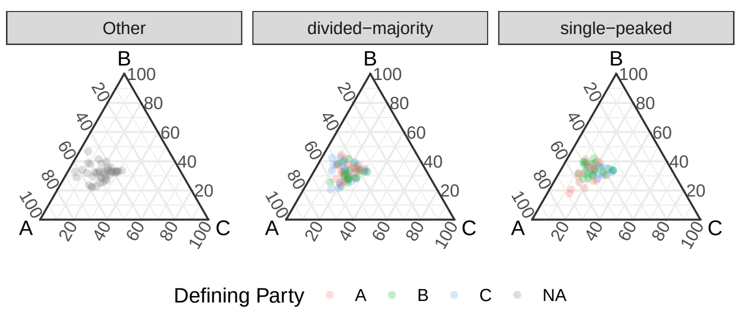

Figure 2: Distribution of first preferences in CSES cases, by class

6 Results

Section 2 describes our analytical approach, which we apply to the CSES data described in Section 4. For each case in the CSES, we obtain a matrix $\mathbf{X}$, where the rows correspond to respondents, and each row $x_i^\mathsf{T} = [\tau_{Ii}, \tau_{Pi}]$.[4] In this section, we present our main results.

[2] X is the attractor: both remaining parties have a majority of their second preferences tilted towards X.

[3] Here, X is the repeller: both remaining parties have a majority of their second preferences tilted towards each other and away from X.

[4] Shorthand notation: τ_I is the strategic incentive under **I**RV, and τ_P is the strategic incentive under **P**lurality.

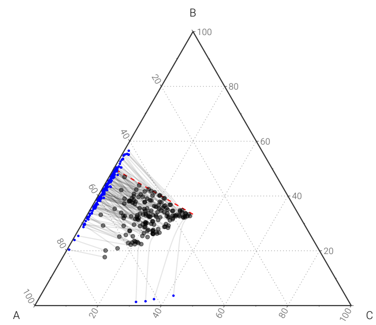

Figure 3: Distribution of ballot shares in iterative process.

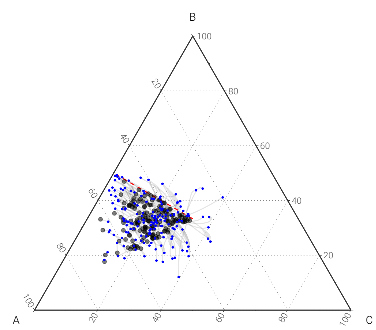

Figure 4: Distribution of ballot shares in iterative process.

6.1 Convergence

6.2 Strategic Incentives

7 Conclusion

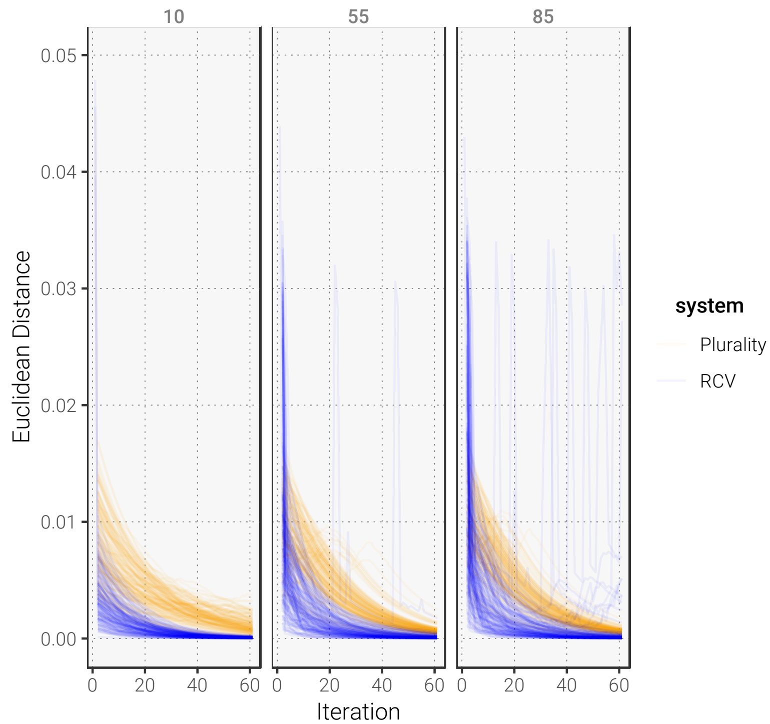

Figure 5: Distribution of ballot shares in iterative process.

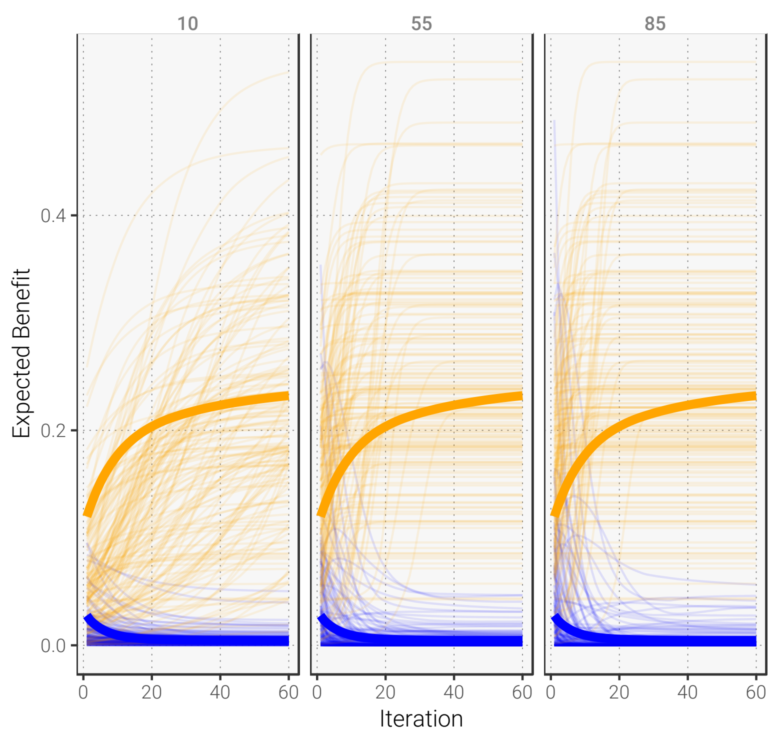

Figure 6: Distribution of ballot shares in iterative process.