Erasmus
School of
Economics

Voting Method Recommendation

Assignment for
Collective Choices and Voting Methods
FEB13103
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December 7, 2024

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1 Recommondation

We think **Approval Voting** is the most suitable voting method for the island.

Approval Voting allows voters to approve or disapprove of each candidate, enabling them to support multiple candidates. Every voter announces the list of candidates, which he approves of and the candidate with the most approvals wins (Laslier & Sanver, 2010, p. 1).

In case of a tie, apply some random procedure where each of the tying candidates has an equal probability of winning. For instance, applying coin toss in the case of a 2-candidates tie.

2 Rationale

The design of voting methods should align closely with local conditions. In this context, two key characteristics amplify the advantages of Approval Voting while mitigating its limitations: first, there are at least six candidates running in the election; second, this is the region's first-ever election.

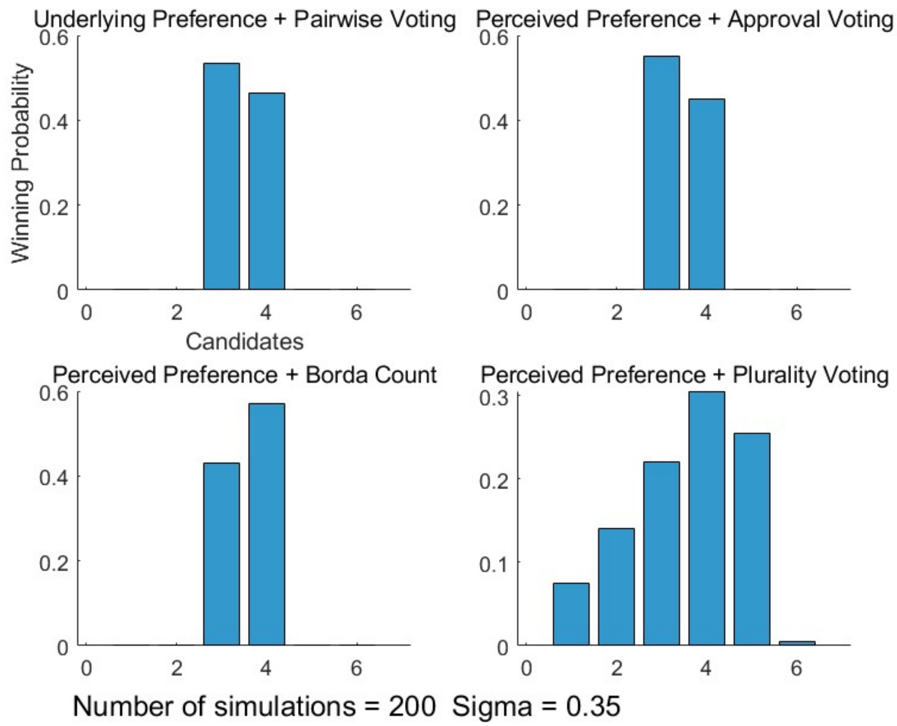
2.1 Closer to True Preferences

According to political economy theory, the presence of a large number of candidates suggests that their positions are likely to be approximately evenly distributed across the political spectrum. In practice, this results in a lack of clear distinctions between the candidates' perceived stances. Consequently, voters may struggle to accurately discern the platforms each candidate represents—a challenge compounded by the inexperience of first-time voters who possess limited knowledge of electoral competition. As a result, it is highly likely that voters' perceived preferences deviate from their underlying true preferences.

Approval Voting addresses this issue by allowing voters to approve all candidates they find acceptable, thereby eliminating the need for ranking—a process that is inherently difficult, especially when candidate positions are closely perceived. This feature reduces the likelihood of errors and inconsistencies in expressing voter preferences.

To demonstrate this, we constructed a mathematical model and conducted computer simulations to study the difference between the actual winner and the "best winner" under different voting systems. The "best winner" is selected using the pairwise voting method based on people's true preferences, representing the most suitable candidate from a god's-eye perspective. The actual winner, on the other hand, is selected based on the voters' perceived preferences using some feasible voting method. The results show that both Borda Count and Approval Voting closely approximate the best result, while Plurality Voting deviates significantly. Given that Borda Count is more complex, as it requires ranking all six candidates clearly, we conclude that Approval Voting is the most suitable."

Due to time constraints, we were unable to simulate more voting methods under perceived preferences. Technical details are provided in the appendix.



2.2 Avoiding Strategic Voting

Approval Voting would lead to fewer incentives for strategic voting, as voters can approve of all candidates they find acceptable without having to worry about ranking or manipulating their vote.

This greatly enhances the fairness of elections, especially in a context where many voters lack prior electoral experience or knowledge. Otherwise, a small, strategically knowledgeable subset of the electorate could disproportionately influence the results. Approval Voting mitigates this risk by simplifying the decision-making process for voters.

2.3 Easy to Apply

The operational logic of Approval Voting is straightforward and easy to implement, making it particularly suitable for regions without a history of elections.

In addition, complex voting procedures often create opportunities for those with advanced electoral knowledge to exploit the system for personal advantage. By contrast, the simplicity of Approval Voting promotes fairness and inclusivity, ensuring that the electoral process remains accessible and equitable.

2.4 Drawbacks

Theoretically, the results of Approval Voting can be challenging to interpret, as candidates with the highest approval may not reflect voters' strength of preference. However, in the current context, we believe that voters' perceptions of their own preferences are likely unreliable. Accurately reflecting their "strength of preference" could potentially introduce even greater biases. As a result, this disadvantage is mitigated.

3 Reference

Leslier, J.-F., & Sanver, M. R. (2010). *Handbook on Approval Voting.* Springer.

4 Appendix

4.1 Declaration of Generative AI

During the preparation of this work the authors used LLM for language polish and code compiling. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

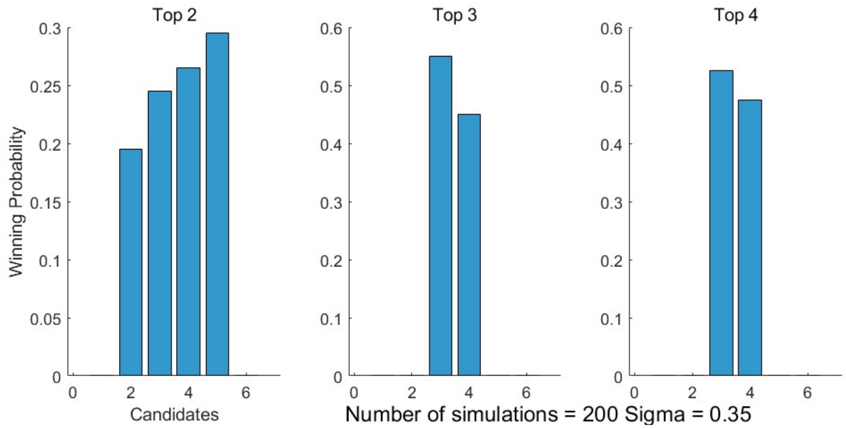
4.2 Explanation of the Mathematical Model and Simulation

Consider an election model with six parties and 2000 voters. The policy platform of party j is denoted as p_j, and the bliss point of voter i is denoted as x_i. We record $d_{ij} = [x_i - d_j]$ as the distance between voter i and party j, where a smaller value of d_{ij} indicates a greater preference of voter i for party j. Let $\mathbf{d}_i = (d_{i1}, d_{i2}, \ldots, d_{i6})$ be the preference vector of voter i. Both the parties platforms p and the bliss points x are uniformly distributed along the one-dimensional political spectrum $[-1, 1]$.

We now introduce the concepts of *underlying* and *perceived* preferences. The above variables are considered to represent the *underlying* positions of the parties and voters, which are their true positions. The perceived position of party j by voter i, denoted as p'_{ij}, follows a normal distribution with mean p_j and standard deviation $\sigma = 0.35$. Hence, we define $\mathbf{d}'_i = (d'_{i1}, d'_{i2}, \ldots, d'_{i6})$ as the perceived preference by voter i for party j. In reality, voters cast their votes based on $\mathbf{d}'_i$, not $\mathbf{d}_i$.

The goal is to identify the "best winner," which is the candidate who should be elected from a god's-eye perspective, that is, based on d_i. We adopt the pairwise voting method, where the candidate who wins the most pairwise contests is elected. This method is chosen because it maximizes the collection of voters' preferences. The results show that candidates 3 and 4 have approximately equal probabilities of winning. In each simulation, the winner won 5 contests, making them Condorcet winners. This suggests that candidates 3 and 4 are the "best winner" under this model, and we need to find a voting method that closely approximates this result.

We attempt to identify the actual winners under different voting methods, using the perceived preferences d'_i as the basis for voting. Under the *Borda Count* method, the actual winner is very close to the best winner. In contrast, under *Plurality Voting*, the actual winners are scattered, indicating that this method does not perform well in selecting the best winner. Under *Approval Voting*, assuming that each voter votes for the top two preferred parties, the result is poor. However, if voters are assumed to vote for their top three or four parties, the result closely matches the best candidate.



Additionally, the results vary when σ takes different values. A value of $\sigma = 0.35$ is chosen based on the idea that the perception of a party's position by a voter mainly fluctuates within the range of the two neighboring parties, though this assumption has not been rigorously verified.

The MATLAB code used in this study is available on GitHub: MATLAB Code for Voting Simulation

4.3 Word Count

The main text of this assignment contains 624 words.