

## **Voter Shifts and Spatial Models of Party Competition**

The standard model of electoral and party competition in political science is the **spatial model**, based on the assumption that voters and parties can both map their political views to a point in some **issue space**, and that voters choose the party whose views are closest to theirs. However, since neither voter nor party positions are immediately known to us, we cannot directly test whether this model correctly describes reality. Instead, we can only run indirect tests, checking whether the model's predictions agree with empirical observations.

In our project, we seek to test one such prediction. What happens when voters shift between parties? According to the spatial model, they should move to one of the neighboring parties. Given parties' positions in the issue space, we can actually estimate the magnitude of those shifts – and test whether the estimates agree with the electoral data.

The main challenge of the project is how to estimate voter shifts and party positions from available data, given that neither can be directly observed. In both areas we do not start from scratch, as both voter shift estimation and party position estimation are problems that have long attracted scholarly attention. Nevertheless, in both areas we hope to advance beyond the state-of-the-art methods by leveraging methodological advances made in other fields and disciplines.

In the field of vote shift estimation, we plan to combine statistical reasoning based on precinct-level vote results with mathematical models of how votes are distributed between parties. In particular, we will focus on one family of such models, known as the urn models, and characterized by the rich-get-richer behavior.

In the field of party positioning, we will integrate results from many methods, including those based on algorithmic program analysis, comparison of program word frequencies, parliamentary voting records, and social media follower networks.

The project will be highly interdisciplinary in character, combining political science, mathematics, computer science, linguistics, mathematical statistics, and sociology. Within political science, the project's impact will be primarily in electoral studies and in the study of party systems and party competition. Outside political science, there will be impact in social choice and computational social choice.

Using those methods, we will test our hypothesis for more than 20 countries, including most EU member countries, as well as several non-EU democracies. If we find agreement between our vote shift estimates and the predictions obtained from the spatial model, this will be an important in favor of the latter. If we fail to do so, this will result will be point towards the need of revision or refinement of the spatial model.