The Journal of Open Source Software

coalitions: Coalition probabilities in multi-party democracies

Andreas Bender[1] **and Alexander Bauer**[1]

1 Statistical Consulting Unit, StaBLab, LMU Munich

DOI: 10.21105/joss.00606

Software

- Review
- Repository
- Archive

Submitted: 05 March 2018
Published: 06 March 2018

Summary

In multi-party democracies, election coverage usually focuses on raw results from polls on questions like

> Who would you vote for if the election was tomorrow?

Whether a coalition (union of multiple parties) will obtain enough votes to form a governing coalition is discussed by adding up votes obtained by the parties in question, while ignoring sample uncertainty and redistribution of votes for parties beneath a specific threshold (e.g., 5% in Germany).

The **R** (R Core Team 2016) package `coalitions` (Bender and Bauer 2018) implements methods that overcome those shortcomings and quantifies sample uncertainty in terms of probabilities for events of interest. Specifically, it contains functions to

- Obtain survey results from different polling agencies,
- Aggregate (pool) multiple surveys (from different pollsters) within a pre-specified time-window, taking into account the correlation between different polling agencies
- Perform Monte Carlo simulations of election outcomes based on the (pooled) survey results
- Redistribute votes based on the method specific to the election of interest (e.g., Saint-Lague-Scheppers for German *Bundestag* election)
- Calculate Bayesian posterior probabilities for specific events, e.g., to obtain enough votes ($> 50\%$) to form a governing coalition

To get started

- the workflow vignette describes the usual steps during the analysis
- the pooling vignette gives details on the aggregation of multiple surveys.

An example for the (backend) application of the package can be found at

- http://koala.stat.uni-muenchen.de,

where it is applied to German (federal and state wide) elections/surveys.

Currently, the functionality focuses on German federal and state-wide elections. However, it can be easily extended to other multi-party democracies, given the user can obtain the necessary data and transform it to a suitable format. For example, the methods have been successfully applied to calculate coalition probabilities for the 2017 elections in Austria. Contributions are welcome at: https://github.com/adibender/coalitions

References

Bender, Andreas, and Alexander Bauer. 2018. "Adibender/Coalitions: V.0.6.0." https://doi.org/10.5281/zenodo.1188812.

R Core Team. 2016. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.