

# Predicting Political Ideology Using Campaign Finance Data

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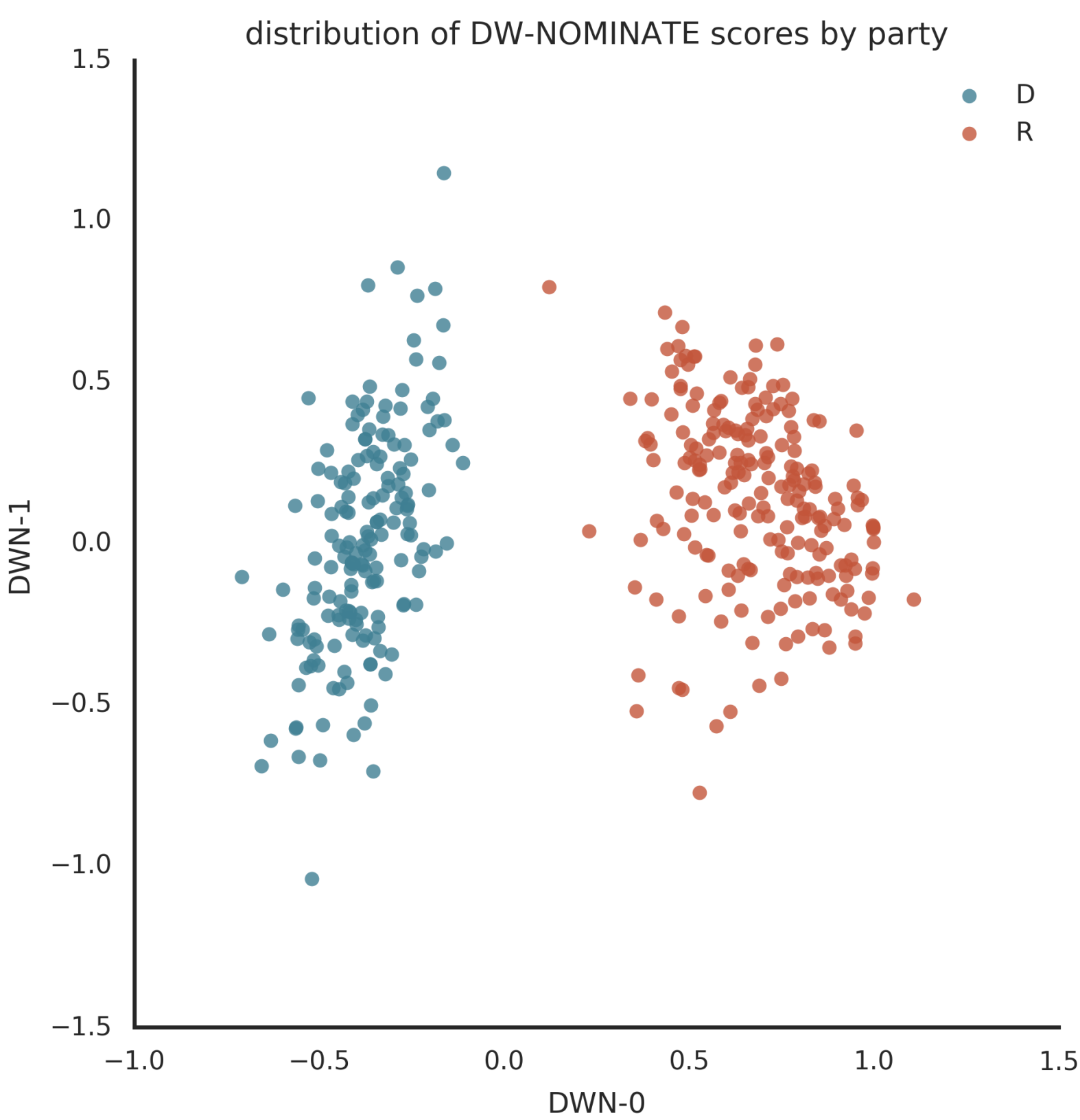
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## Background

The research of Poole and Rosenthal has focused on quantifying representative political ideology [3] via the DW-NOMINATE method. This method calculates a legislators overall probability of voting ‘yea’ on a piece of legislation as the sum of a deterministic utility value and a random error [1]. ‘Ideal point’ coordinates were obtained for legislators by maximizing the log likelihood function

$$\mathcal{L} = \sum_{t=1}^T \sum_{i=1}^{p_t} \sum_{j=1}^{q_t} \sum_{\tau=1}^2 C_{ij\tau t} \ln P_{ij\tau t}$$

where  $P_{ij\tau t}$  is the probability of voting for choice  $\tau$  and  $C_{ij\tau t} = 1$  if that probability accurately predicts the vote [1]. Indexes  $j$ ,  $i$ , and  $t$  sum over roll call votes, legislators, and legislative sessions, respectively. Ideal points lie within the interval  $[-1, 1]$  and are two-dimensional quantities. A common interpretation of the first coordinate is that it reflects the divide between the Republican and Democratic parties, whereas the second coordinate is more highly correlated with intra-party division. The distribution of these scores is illustrated below.



While a full congressional voting record would be unavailable for candidates who are new to office, campaign finance data are often readily available. It would be useful to be able to predict the ideal point of a candidate even before they have established a congressional voting record. Furthermore, the ability to do so would help elucidate a relationship between monetary contributions to candidates and the voting patterns those contributions may effect.

## References

- [1] Royce Carroll et al. “Measuring bias and uncertainty in DW-NOMINATE ideal point estimates via the parametric bootstrap”. In: Political Analysis 17.3 (2009), pp. 261–275.
- [2] DW-NOMINATE Scores With Bootstrapped Standard Errors. <http://voteview.com/dwnomin.htm>. Accessed: 2015.10.01.
- [3] K.T. Poole and H. Rosenthal. Congress: A Political-Economic History of Roll Call Voting. Oxford University Press, 2000.

