Left/Right or U? Estimating the Dimensionality of National Party Competition in Europe

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Abstract

Comparative studies report the rise of left- and right-wing Eurosceptic parties that have transformed national party competition in Europe toward an inverted U-shaped configuration: Peripheral parties at the left and right of the party spectrum oppose while centrist parties support several features of European integration. To describe the tempo and timing of this transformation and the heterogeneity across countries, we develop a Bayesian finite mixture factor analysis that estimates the election-specific probability of a one-dimensional left/right versus a two-dimensional inverted U-shaped national party configuration. The results show a general trend toward "U" but with significant variation across countries and time, including cases with a reversal of this trend.

Keywords: dimensionality, party competition, mixture model, European integration

An online appendix with supplementary material is available at XXX. Replication files are available in the JOP Data Archive on Dataverse (http://thedata.harvard.edu/dvn/dv/jop). Support for this research was provided by the Collaborative Research Center "Political Economy of Reforms" (project C6), which is funded by the German Research Foundation (DFG). Moritz Osnabrügge thanks the ERC for financial support (advanced grant 694583).

The recent rise of left- and right-wing Eurosceptic parties is well documented by comparative studies (Kriesi 2007; Marks, Wilson, and Ray 2002; Taggart 1998; Van Elsas and Van der Brug 2015). A prominent explanation for this general trend is that European integration with the ongoing transfer of policy-making competences to the EU level is promoting a conflict "about more or less European integration derived from deep social, cultural, national and territorial traditions," which cross-cuts the traditional left/right conflict of party competition in Europe (Hix and Lord 1997, 27). The resulting configuration mirrors an inverted U-shape: Peripheral parties at the left and right of the party spectrum oppose while centrist parties support several features of European integration (Hix and Lord 1997; Marks, Wilson, and Ray 2002).

Similar to other applications of mixture modeling to test competing theories in political science (e.g., Imai and Tingley 2012), this article uses a Bayesian finite mixture factor analysis to identify time- and country-specific variation in the transformation of national party competition. In particular, we estimate if parties are more likely to be ordered either along the one-dimensional left/right dimension or the two-dimensional inverted U-shaped configuration. The estimated election-specific probability can be interpreted as a model-choice quantity that varies across countries and time and that allows us to paint a dynamic picture of change in the dimensionality of policy spaces across Europe. Our estimates are based on the Comparative Manifesto Project data (CMP) and we additionally use expert survey knowledge on the current configuration of party families from the Chapel Hill Expert Survey (CHES) to construct informed prior densities.

Bayesian Finite Mixture Factor Analysis

To estimate the election-specific configuration in national party competition, we apply our approach to the coded manifesto data from the CMP project (Budge et al. 2001) covering parties' programmatic electoral declarations of all EU member countries between 1945 and

2010. To use CMP data in a spatial context, we follow Lowe et al. (2011) and transform coded manifesto data into issue-specific positions of political parties (König and Luig 2012). This transformation is necessary because the data generation of the CMP project is based on saliency theory, which counts the frequent usage of the coded 56 categories instead of the parties' spatial location (Laver and Garry 2000). These issues cover a broad range of topics from administration to the welfare state. A detailed description of the data is available in the online appendix (König et al. 2017).

We define $\mathbf{y}_j$ as the j^{th} $(j = 1, ..., J)$ row of our data matrix with L $(l = 1, ..., L)$ columns. Each cell contains the position of a party j on an issue scale l for a particular national election. Building on Bayesian factor analytic models (e.g., König, Marbach, and Osnabrügge 2013; Quinn 2004), we assume that each issue position is a weighted sum of latent party positions plus measurement error. The weights are the factor loadings and indicate the extent to which a particular latent party position is determined by each issue scale. Similar to previous factor analytic models for CMP data, we assume that the latent policy space is orthogonal and the factor loadings are constant across countries and over time (e.g., Gabel and Huber 2000). Note that this assumption can be relaxed if additional assumptions are introduced to identify the model.[1]

Formally, let $\boldsymbol{\chi}_j$ be the unobserved D-dimensional position of a party in an election (the factor) and let $\boldsymbol{\lambda}$ be the $L \times D$ matrix of factor loadings. We can then write the mixture of factor analysis models as follows:

[1]For example, if we allow for variation of the factor loadings across elections, the factor loadings and mixture probabilities co-vary across the same set of observations, rendering them jointly inestimable without making additional assumptions that restrict either some of the mixture probabilities or some of the factor loadings to be dependent.

$$\mathbf{y}_j = \begin{cases} \boldsymbol{\lambda}_1 \chi_{j,1} + \mathbf{e}_1 & \text{if } k_j = 0 \\ \boldsymbol{\lambda}_1 \chi_{j,1} + \boldsymbol{\lambda}_2 \chi_{j,2} + \mathbf{e}_2 & \text{if } k_j = 1 \end{cases}$$

$$\mathbf{e}_1 \sim \mathbf{N}(0, \boldsymbol{\Sigma}_1)$$

$$\mathbf{e}_2 \sim \mathbf{N}(0, \boldsymbol{\Sigma}_2),$$

where k_j is a binary indicator variable that indicates whether a party has a one- or two-dimensional position. Note that, if we could directly observe this variable, two ordinary factor analysis models - the first being one-dimensional and the second two-dimensional - are estimable. However, since we do not know the dimensionality of an election-specific policy space, we have to estimate this parameter from the data. Integrating the unobserved k_j for each election e, $(e = 1, ..., E)$ from the joint density and assuming measurement error independence across issue scales, the likelihood function with the standard normal density Φ and variance w_l^2 can be written as follows:

$$\mathcal{L} = \prod^{J} \left[\left[\prod^{L} \Phi\left(\frac{y_{l,j} - (\lambda_{l,1}\chi_{1,j})}{w_{l,1}} \right) \right] \pi_{e[j]} + \left[\prod^{L} \Phi\left(\frac{y_{l,j} - (\lambda_{l,1}\chi_{1,j} + \lambda_{l,2}\chi_{2,j})}{w_{l,2}} \right) \right] (1 - \pi_{e[j]}) \right],$$

where $\pi_{e[j]} = \Pr(k_{e[j]} = 1)$. We adopt the Gelman-Hill notation and let j select the corresponding index e to relate the j^{th} observation to a corresponding π. Our primary interest is in π_e indicating the probability of a particular dimensionality of the policy space in the election e. To simplify the presentation of the results, we refer to π_e as the configuration parameter. We exploit the functional equivalence of informed prior densities and parameter restrictions to identify the model. In the online appendix, we discuss the details.

Compared to studies using model fit measures (e.g., Albright 2010; Bakker, Jolly, and Polk 2012; Stoll 2010; Warwick 2002), where it remains unclear whether and to what extent the meaning of the first (left/right) dimension in the one-dimensional model is identical to

the first dimension in the two-dimensional model, the important advantage of our approach is that the substantive meaning of the first (left/right) dimension is identical across the two different scenarios of party competition. While estimating two separate models (a one- and a two-dimensional model) and comparing their fit is computationally easier, our approach allows to ensure that parties' positions and factor loadings on the first (left/right) dimension to be the same across the two different scenarios.

Party Families as Priors

We construct a prior from recent expert surveys with information about the current configuration of party families to estimate the election-specific probability of a transformation from a left/right toward an inverted U-shaped configuration scenario. Using this party-family prior allows us to include information on the scenario rather than the exact location of party positions. For each latent party position ($\boldsymbol{\chi}_j$), we employ a multivariate normal prior, whereby we set each party's prior mean and variance to the mean and variance of its party family. We calculate these means and variances for the positions of seven party families separately for the left/right and European integration positions from three waves of CHES expert survey data (Steenbergen and Marks 2007; Hooghe et al. 2010). We center all parties' priors that are not part of a party family at 0 and assign a variance of 11, which effectively provides no a priori information about the location of the party in the latent policy space.

Figure 1 illustrates the party positions of the CHES data and the superimposed prior density by party family. As documented by the comparative literature on Euroscpetic parties (e.g., Taggart 1998), the relation between party positions on the left/right in the second scenario has an inverted U-shape. In other words, the more extreme a party's position with respect to the left/right, the more critical the party is toward European integration. The data also suggest that Green and Conservative parties are more critical toward Europe than Socialist, Liberal, and Christian-democratic parties.

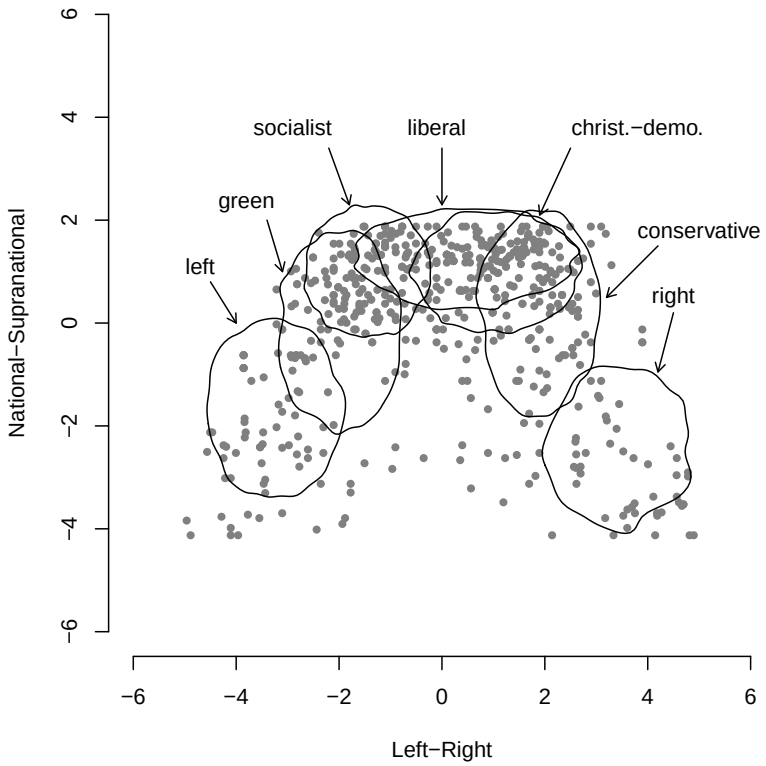

Figure 1: Priors for party families

Note: The party family positions stem from the CHES data, and the contours were calculated on the basis of a kernel density estimation for each party family.

Using informative priors raises questions on their impact for the posterior estimations. First, we note that our priors provide no information about differences between parties from the same family. Consequently, all posterior differences between parties from the same family arise only from the data. However, our priors are deliberately informative with respect to the shape of the latent space because they assign parties belonging to the same family subspaces. Second, the location of parties to subspaces is not deterministic. If the data diverge greatly from the prior, they overwhelm the prior information and the party family's posterior subspace (e.g., the collection of party posterior means) moves away from the prior subspace.[2]

[2]For all remaining parameters where we have little a priori information, we use vague priors. In particular, regarding the factor loadings ($\boldsymbol{\lambda_l}$), we employ zero-centered multivariate normal priors with a diagonal covariance matrix with all elements set to 100, and for

Results and Conclusion

We make inferences about the parameters of interest by summarizing simulated draws from the posterior density of our model using JAGS. Details on MCMC parameters and convergence diagnostics are in the online appendix. While we obtain samples from three sets of parameters – the configuration parameters (π), factor loadings (λ), and latent positions of the parties (χ) – we present only the estimated election-specific configuration parameter for the 15 countries that joined the EU up to the mid-1990s. In the online appendix, we discuss the results for the other parameters and various robustness tests. Furthermore, we confirm the validity of our results by comparing our estimated party positions to other expert survey data and an existing classification of Eurosceptic parties (Taggart 1998).

The estimates for the configuration parameter suggest that, on average, the probability of a one-dimensional left/right configuration decreases from 66% after World War II to approximately 32% in 2010. However, there is considerable heterogeneity across countries in this trend. Figure 2 shows the probability of a left/right configuration for each national election by country, which we order along the country's accession date to the EU. To interpret the country-specific trends, we use the average fitted curve of a local polynomial regression.

The figure reveals three types of trends. First, the probability of a one-dimensional left/right configuration in national party competition decreases over time. Belgium, Germany, Italy, Luxembourg, and the Netherlands exhibit a strong monotone, negative trend beginning in the 1970s. Closer inspection of these EU founding members shows that France is more likely to have an inverted U-shaped configuration beginning in the late 1950s, Belgium, the Netherlands, and Luxembourg beginning in the early 1980s, and Germany and

the variance components ($w_{\cdot,\cdot}$)), we use gamma priors (a0 = 0.001, b0 = 0.001). For the configuration parameter set ($(1-\pi_e, \pi_e)$), we use the uniformly shaped beta prior ($d = (1, 1)$). This prior embodies our a priori belief that both configurations are equally likely. Note that we run robustness tests to check the impact of our priors.

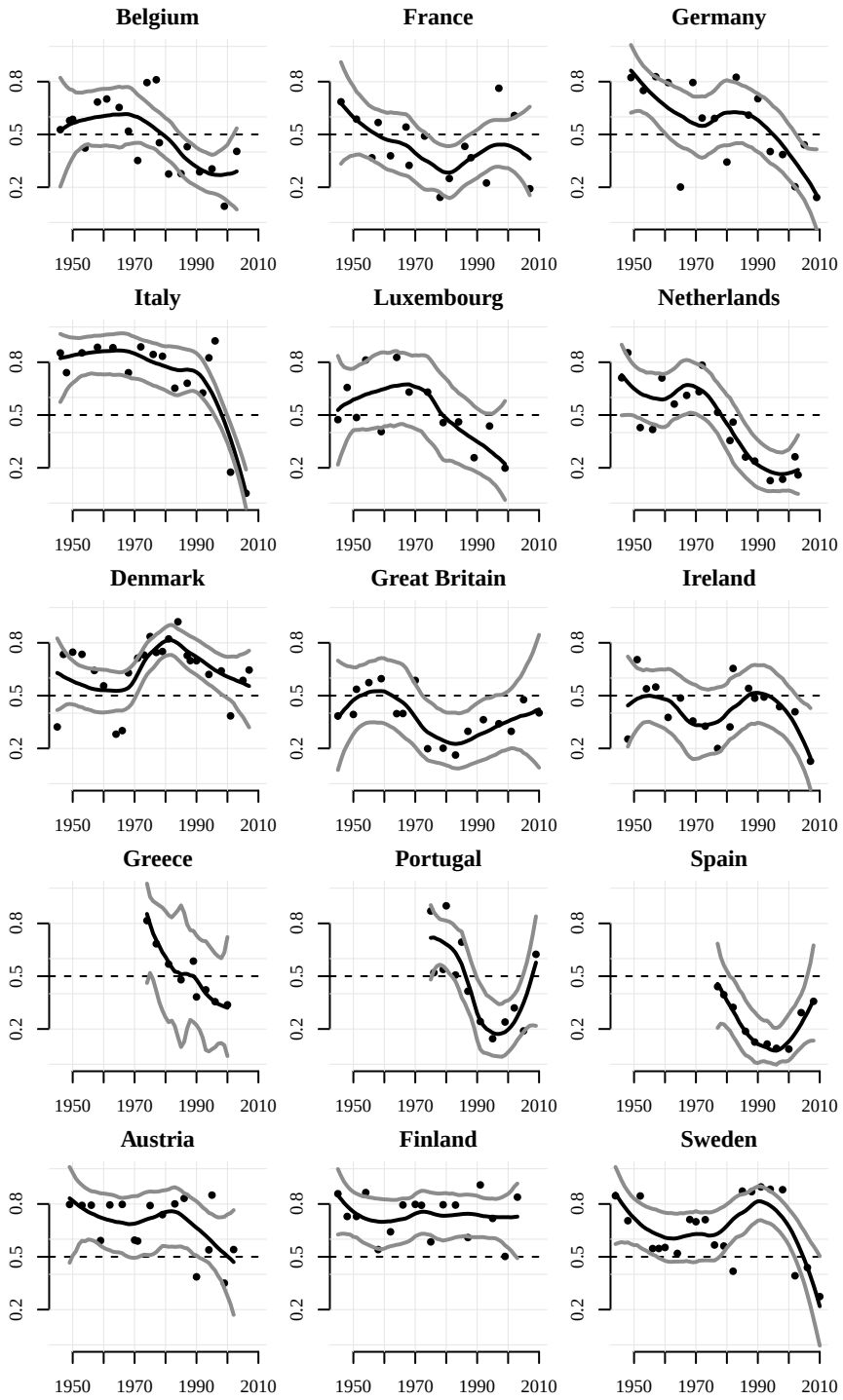

Figure 2: Posterior probability of a left/right configuration ($D = 1$) for specific countries

Note: We fit a local polynomial regression on each posterior draw. The solid black line indicates the average fitted curve. The gray lines indicate the 2.5%- and 97.5% quantiles.

Italy beginning in the late 1990s. Austria and Sweden, which acceded in 1995, appear to have had an inverted U-shaped configuration since the 2000s. Interestingly, Greece acceded in the beginning of the 1980s and shows a trend very similar to that of the founding members. Second, some countries have either a one- or two-dimensional configuration almost all the time after World War II. Denmark's and Finland's national party competition remains a one-dimensional left/right configuration. The trends of Great Britain and Ireland, the two other accession countries of this period, are non-monotonic but suggest an inverted U-shaped configuration. Third, Portugal and Spain, which jointly acceded in the mid-1980s, exhibit a monotone trend until the first decade of the 21st century and an indicative reversing trend thereafter.

To the extent that the features of European integration become more salient over time, the inverted U-shaped configuration of party positions will have important implications for national party competition with a change in the dimensionality of the policy space, which "is a central determinant of political competition and outcomes" (Gabel and Hix 2002, 934). While existing studies often need to assume that the dimensionality of the policy space is fixed in national party competition, we conclude that the dimensionality differs substantially across countries and time. Accordingly, scholars can use our results to specify the dimensionality of the policy space when comparing national party competition across countries and time. We leave it to future research to advance our theoretical knowledge about the conditions under which national party competition changes and how these changes affect the parties' behavior, such as the making and breaking of (coalition) governments and law-making.

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