

# Valence and Ideological Proximity in the Rise of Nationalism: Party Support in the Spanish General Elections, 2008 and 2011

Elena Labzina\*and Norman Schofield†

Washington University in Saint Louis.

April 23, 2015

## Abstract

Spatial models of voting provide a formalization of the strategic process in which parties and voters compete in the elections. Following the logic of the classic spatial models, changes in party electoral support depend on the ideological distance between the parties and their electorates. However, a substantial share of the electoral volatility

---

\*len4ick@gmail.com

†schofield.norman@gmail.com

cannot be explained in spatial terms. This paper shows that fluctuations in the electoral support for political parties maybe fundamentally determined by exogenous party valence. To test this hypothesis, we implement a modification of the multinomial logistic regression for the varying individual choice options (VCL) and apply it the Spanish General Elections in 2008 and 2011.

## 1 Introduction

During the last few years, in the aftermath of the bank crisis of 2007, anti-European and right or far-right parties started to gain more and more support across Europe. This reaction seems a natural response to austerity measures and the rise of unemployment in the region. Meanwhile, in some European countries that have a different cultural identity to the dominant identity, a seemingly significant rise of peripheral nationalism has occurred (Palmer (2013)).

Predictably, common economic logic says that the scarcity of resources would likely boost the "unwillingness to share"<sup>1</sup> mentality, especially among those who have more than others. Hence, the rise of local nationalism might be expected in "rich regions" in "poor times". The most prominent recent examples are Scotland in Great Britain and Catalonia in Spain. Contrary to the Scottish Independence Referendum Act, passed in 2013, followed by

---

<sup>1</sup>This argument is based on common micro economic logic: that when there is less money in the economy, any distribution toward a more egalitarian state affects the richest regions more severely(?)

the referendum 2014, attempts by the Catalan parliament to have actual self-determination have been blocked by the current government and by the Constitutional court.

The rise of the support of the nationalist parties turns out to be a part of the overall trend of a rise in support for non-marginal minority parties<sup>2</sup> (figure 1). This paper argues that contrary to common explanations that see the rise of nationalist parties as a consequence of the rise of nationalist preferences, the rise of support for nationalist parties can hardly be explained by a spatial understanding of the politics of Spain. Instead, the voters seem to be choosing these parties because of their perceived valence. In other words, voters may perceive minority parties (including nationalist parties) of being more capable of effective governance or pursued political outcomes (Heller (2002)). To prove this, I apply the *multinomial logistic model for the varying choice sets* to the data from surveys from *Centro de Investigaciones Sociológicas (CIS)* . The spatial voting model assumes a two-dimensional ideological space that captures positions of parties and voters along (1) a socio-economic left-right divide, and (2) a central-periphery divide that pits the large parties with the countrywide coverage against parties that advocate either for regionalist issues or for outright secession from Spain.

There are multiple reasons to study Spain for the purpose of this research. First, despite Spain's unified rules across regions for parties running

---

<sup>2</sup>Here and further in the text non-marginal minority parties are all parties getting more percentage than 1 % with the exception for BNG, the Galician nationalist parties.

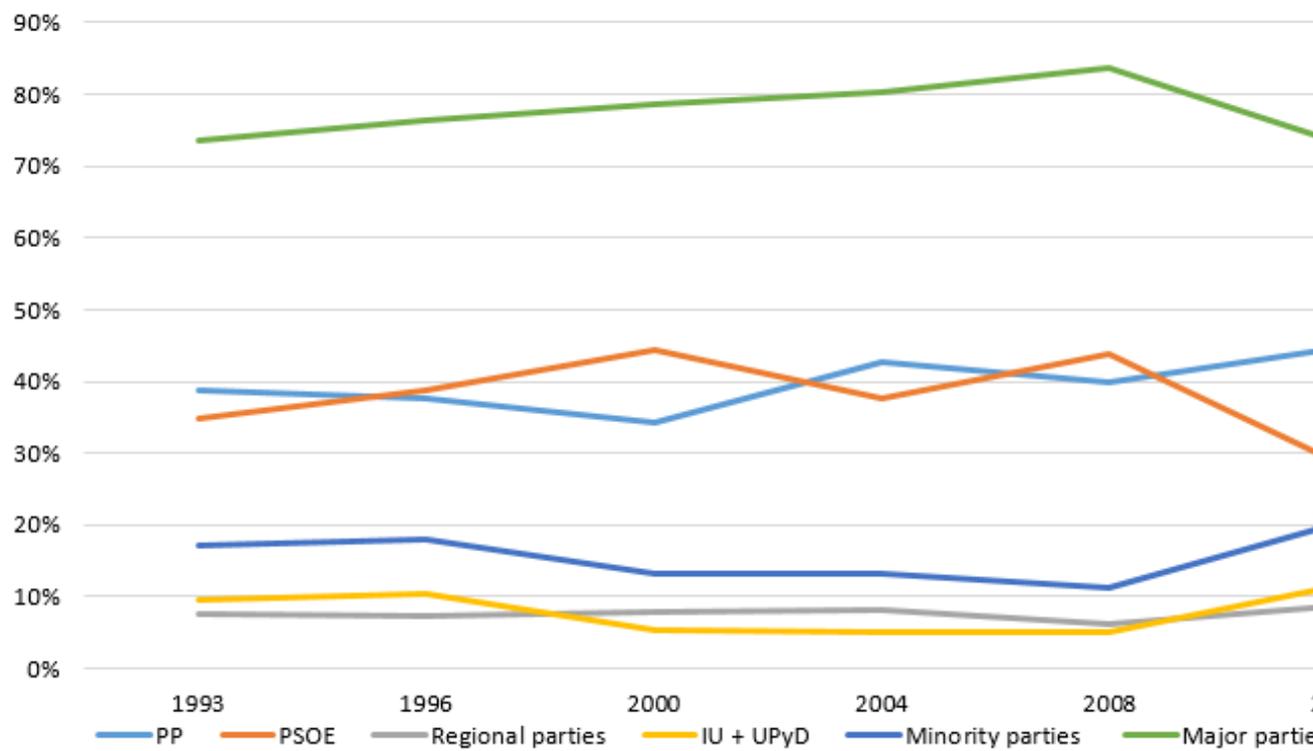


Figure 1: Figure1. Voting shares' dynamics: General Spanish Elections 1993-2011

for the main Parliament, it has territories with a long history of nationalist identity, including their own languages. Overall, 17 autonomous communities of Spain provide a significant variation in ideological terms as defined above (i.e Perez-Nievas and Fraile (2000), Balcells and Ventura (2007)) For the last forty years, a process of gradual decentralization has taken place in Spain. Hence, besides a perceived self-identification, especially in certain regions, all of them have a high level of explicitly institutionalized fiscal and political independence (Perez-Nievas and Fraile (2000)). This provides a stand point to view regions of Spain as relatively separate political and economic entities. In addition, in terms of the results for the General Elections in 2008 and 2011 the regions provide a variance as well. For example, in 2008 in Madrid *PP* gained a substantial result of 49.19 %, while in *Catalonia* and *Basque Country* - just 16.40 and 18.53 % respectively. Meanwhile, *PSOE* won 39.68 % in *Madrid* and 45.39 % and 38.14 % in *Catalonia* and *Basque Country* respectively. In 2011, in *Madrid* *PP* and *PSOE* gained 50.97 % and 26.05 %; 20.7 % and 29.35 % in *Catalonia*, and 17.81 % and 21.55 % in *Basque Country*. Importantly, in *Basque Country* in 2011, both regional parties, *PNV* and *Amaiur*, obtained more votes than the major parties, 27.41 % and 24.11 % (del Interior (2015)).

Secondly, in the presence of the strong state-wide major parties, *PSOE* and *PP*, there are 2 non-marginal statewide parties, *UI* and *UPyD*, and multiple non-marginal nationalist parties: *CiU* and *ERC* in *Catalonia*, *PNV*

and *Amauir*<sup>3</sup> in *Basque Country*. This situation is in contrast to Scotland or Canada, in which only one nationalist party exists in each (*Scottish National Party* in Scotland, UK (Labzina and Schotfield (2015)) and *Bloc Quebecois*, Canada (Gallego et al. (2014))). Hence, given the multiple number of various nationalist parties, results based on Spain could be more generalizable than in case of UK or Canada, since they would be less specific for particular parties or regions. Moreover, the electoral results of the General Elections in 2008 and 2011 contrast significantly in votes for the major parties, that lost 10 % of their combined support.

The third reason is a clear separation of the central-periphery ideological dimension and socio-economic ideological dimension that started to prevail in the research on regional Spanish politics relatively recently (Dinas (2012)). This shows the effect of the peripheral nationalism on the votes separately, and, on the intermediate stage of the spatial analysis, provides a chance to contrast the regions on a two-dimensional ideological scale. Also, this provides a sense of how sensitive the people of various regions are to ideological changes in each ideological dimension.

Lastly, from the technical perspective, *Centro de Investigaciones Sociológicas (CIS)* provides high quality regular surveys conducted on a large number of individuals. To start, these surveys give an opportunity to create balanced ideological scores, capturing various ideological aspects in a condensed form, applying *principal component analysis* to a number of rel-

---

<sup>3</sup>Amauir was formed before the General elections in 2011

evant questions. Next, the size of the survey samples helps to overcome the methodological challenge of inapplicability of the *standard multinomial logistic* regression, because the sets of political parties vary across regions. The modification of MNL for the varying individual choice options (VCL) (Yamamoto (2011)) requires a decent number of observations for each region. Importantly, VCL method itself is a recent invention introduced by Yamamoto in his working paper in 2011. As a methodological contribution, this paper presents a refinement of this method that can be easily employed even by non-methodologists.

The outline of this paper is as follows. First, a review of the development of the spatial models is presented. In this section, the notion of *valence* is introduced and specified. The second section presents a review of the related methodology as it developed over time. This section contains the most critical details of the final implementation. The last section presents a discussion of the results .

## **2 Background on spatial models and valence in the context of Spain**

This section aims to present the spatial voting model with heterogenous intercepts for each party. This model is one of the last generations in the evolution of proximity voting models. Importantly, the intercepts in this model represent *exogenous party valences* of the parties. In contrast to mod-

els in which parties or candidates can take a position in terms of *valence issues* as well (i.e Ansolabehere and Snyder Jr (2000)), the model employed in this paper lets parties maximize their vote shares only through their ideological positions. This work assumes that since parties do not observe their valence fully *ex ante* - it is defined by the voters - the final electoral positions are not always optimal for the parties. Substantial research has been done on whether the electoral systems in various countries during particular elections are in a local Nash equilibrium, or in a state such that parties have no incentive to even slightly relocate given the position of the other parties (Schotfield and Sened (2006)). However, the focus of this paper is on voters' perceptions about parties, which are represented in terms of *exogenous valence*. Hence, thinking of the elections as a game between candidate parties and voters, this paper focuses on the voters' side.

To start, historically, the voting models were divided into *spatial models*<sup>4</sup> and *social-psychobiological models* (Enelow and Hinich (1984), Bennis et al (2010)). The spatial models evolved as an adaptation of the unidimensional economic model for competitive markets by Hotelling (1929) to political competition by Downs (1957). The major idea of spatial models is that the voter is a rational actor, and she maximizes her utility by choosing the party or candidate located closest to her in the ideological space. Models of this kind might include uncertainty (i.e Enelow and Hinich (1984)); however, the key

---

<sup>4</sup>The spatial models are clearly not restricted to the positional models. Directional models were an important contribution to the voting theory as well (?).

idea here is that individuals are aware of their electoral first-best knowing the ideological positions of the parties.

The *social-psycho-biological* or *behavioral* models emerged as a response to limitations of rational economic approach. As Stokes (1963) argues in his famous critique on spatial models, many assumptions of the Downs model seem not to reflect actual political competition. Among his crucial comments, he addresses the unidimensionality of political space. He proposes to introduce the second ideological dimension, i.e., *morality* or *religiosity*, in addition to the left-right dimension. Also, crucially, he contrasts *position-issues*, which spatial models mainly describe, to *valence-issues*, which lie in a different space.

This is a significant point, since Stokes addresses extensively the notion of *valence*. In its inception, the author defined *valence-issues* as those "*on which parties or leaders are differentiated not by what they advocate but by the degree to which they are linked in the public's mind with conditions or goals or symbols of which almost everyone approves or disapproves*" (Stokes (1992)). Thus, valence issues may be considered to include citizens' evaluations unrelated to parties' policy positions, including parties' and/or candidates' competence, charisma, integrity, psychological affect, etc. Hence, considering ideology as the only rational reason to vote for a party or a candidate, *valence*, in general, may "contain" an irrational component of voters' motivation.

Clarke (2009) presents a somewhat different view on voting models,

contrasting spatial against valence models. Following Stokes (1963), to a large extent, probably the most important point he argues explicitly is that valence models "*focus on delivery*". While spatial models, following the Downsian tradition, assume that delivery happens automatically (Clarke (2009)), Clarke underlines that in the valence approach "*it might be much more crucial who promises than what policy is promised*".

Meanwhile, substantial research attempted to capture *both* valence and spatial components. Partially, that was because in a dynamic multiparty setting, with a proportional electoral system, the discrepancy between actual positions parties take and the predicted median policy position still lacked a satisfying explanation (Schofield (2003)).

Schofield(2003) introduced the probabilistic version of the spatial model using multinomial logistic linear regression. Both of Stokes' (1963) comments mentioned above are included into Schofield's model. Firstly, in most papers, the second "social" dimension is added (Schofield (2003), Gallego et al. (2014)). Secondly, *valence* is re-introduced to explain why, given very similar ideological positions, some parties gain more votes than others. Parties with a lower valence are predicted to take more extreme ideological positions. Indeed, if parties are purely vote-motivated, or, in other words, office-seeking, they would be expected to locate near the median, according to the Downsian paradigm. According to Schofield, *valence* can be of two types: *socio-demographic valence*, which is specific for a particular individual - similar to the factors affecting the vote choice in *social-psychobiological* models;

and *party valence*, which is specific for a given party (Schofield (2003)). Ansolabehere and Snyder Jr (2000)'s utility voting model is similar to Schofield (2003)'s with the distinction that parties take a position in relation to *valence-issues*. Interestingly, given this division, "*party identification*" (Cambell et al. (1966)) might be considered a mixture of both types of *valence*.

Having said everything above, what is *valence*? A strict short specification is hardly possible, since no single common view exists. One of the approaches is to assume that its key variables are partisan attachments (*party identification*, Cambell et al. (1966)), judgements about important issues (Schofield (2003)), and party leader/party images (priv. comm.) (Clarke et al., 2011). Clearly, it is difficult to separate these components. Meanwhile, the emphasis on *delivery* of policies (Clarke et al. (2011), which does not contradict that *valence-issues* may be split into components, is crucial for the argument of this paper. In other words, this perspective focuses on the trust in parties. The question whether such trust is justified in relation to regional parties in Spain is beyond the scope of this paper. However, as mentioned in the introduction, some research argues that this is the case (Heller(2002)). To conclude this historical overview, Clarke et al. (2011) remarks that the view on *valence* as an *unmoved mover* is incorrect, since *valence* may clearly change. Hence, the fluctuation of the party valence might be considered to reflect changes of trust in the party. This paper employs this view.

In regard to Spain, analysts of Spanish politics tended to pay little attention to the debate on the nation-wide nationalist identity (Nunez (2001))

and were focused more on consequences of decentralization and salience of regional nationalism. Hence, two-dimensional spatial models were sometimes used (Fernandez Albertos (2002)), but the common perception was that the socio-economic dimension is significantly correlated with the central-periphery ideological dimension. This belief is still relatively wide-spread among some researchers who address particularly Catalonia and Basque Country (Dinas (2012)). They claim that nationalism and leftist socio-economic political views are strongly interrelated in these regions. Overall, Catalonia and Basque Country have been the center of the research on Spanish politics (Martinez-Herrera and Miley (2010); Martinez-Herrera (2002)). In this context, some argued that Spanish identity is closer to a valence issue than to a policy issue, since two major parties converged in the defense of "a truly Spanish character" (Bonet et al. (2010)). Moreover, little ideological differentiation between the major parties in terms of nationalism led to a lack of empirical approaches to study Spanish nationalism. Nevertheless, some recent work has shown that the time of convergence between PSOE and PP is over. Hence, Spanish politics may start to be influenced by the second ideological dimension that merges Spanish identity and decentralization (Bonet et al. (2010); Fernandez and Rodriguez (2006); Munoz (2009)). This paper confirms this divergence (tables 12 and 13, figures 2-11), especially in nationalist regions.

To sum up, the aim of this work is to show that the source of the increase in voting results of the regional parties between the General Spanish

Elections in 2008 and 2011 was a consequence of changes in their *party valence*. Because of parsimonious reasons, this paper employs a modification of a pure spatial voting model with heterogenous intercepts. This model disentangles ideology into the left-right dimension and the central-periphery dimension (e.g Balcells i Ventura (2007)). This paper assumes that *exogenous valence* reflects changes in voters' trust in the ability of the candidate parties to deliver outcomes pursued by the voters.

### **3 Methodology: Varying Choice Logit**

This paper follows Schofield's stream of research spatial voting models and applies a modification of the multinomial logistic regression to model individual voting choices during the General Elections in Spain in 2008 and 2011. The reason for this choice is that *multinomial logistic regression* is more robust to the quality of data than *multinomial probit regression*. Furthermore, MNL is more intuitive to interpret than multinomial probit (Dow and Endersby (2004)). The major disadvantage of the *multinomial logit regression* is that it requires the independence of irrelevant alternatives (IIA) assumption, i.e the preference between two choice options must be independent of other options. In most cases *IIA* should not be a point of concern and can be assumed satisfied (Dow and Endersby (2004)). However, when individuals in the sample actually do choose from different sets of options, acceptance of *IIA* is counterfactual. Hence, in this paper, the *multinomial logit regression*

requires a modification.

The Spanish General Elections are, in fact, a perfect example of individuals choosing from different sets of options, because people in different regions select from different sets of parties (see tables 6 and 7). For example, a person in Madrid cannot vote for *ERC* or *PNV*. Meanwhile, an individual in Barcelona can vote for *CiU* and *ERC*, but has no option to vote for *BNG*. Everybody in this sample has restricted choices.

Fortunately, the literature already provides a way to overcome the necessity of *IIA* for *multinomial logit regression* (Yamamoto (2011)): *multinomial logit regression for the varying choice sets* or *varying choice logit* a method which will be elaborated in more detail below. The downside of *varying choice logit* is a lack of implemented solutions in the statistical software, consequently a relatively complicated application. This paper presents a refinement of the method, which can be used in the situations when the necessity for *IIA* cannot be neglected.

### 3.1 Formal model

As already mentioned, Yamamoto (2010) proposed an adjustment for the *multinomial logit regression* to address the situation when some individuals in the sample choose from different sets of alternatives.

To make it more intuitive, let's start with a tentative example, a simplified version of the General Elections in Spain. Assume that only *PP*, *PSOE*, *CiU*, and *PNV* participate in the elections. And assume, that the country

consists only of the *Community of Madrid*, *Catalonia*, and *Basques Country*. *PP* and *PSOE* participate in the elections in all regions; *CiU* participates only in *Catalonia*; and *PNV* only in *Basque Country*. A sample is a mixture of individuals from all regions. *PP*, *PSOE*, *CiU*, and *PNV* are *the full set of the alternatives*. If  $r(i)$  denotes the alternatives available for an individual, then her *restricted choice set* is as follows:

$$r(i) = \begin{cases} \{PP, PSOE\}, & \text{if } i \text{ is from } Madrid \\ \{PP, PSOE, CiU\}, & \text{if } i \text{ is from } Catalonia \\ \{PP, PSOE, PNV\}, & \text{if } i \text{ is from } Basque Country \end{cases} \quad (1)$$

(For simplicity, I would refer to these individuals as *m*, *b*, and *c*).

The core idea of Yamamoto's adjustment is take explicitly into account that, for example, given (1), the probability that *m* votes for *CiU* or *PNV* is zero, the same as the probability that *c* votes for *PNV*. The *multinomial logit regression for varying choice sets* keeps all assumptions as multinomial logit regression, except that in calculation of the expected probability of choosing a category only those alternatives are considered from which an individual can actually choose (hence, IIA is not required). Formally, the general formula for the probability that individual *i* votes for *j* is defined as:

$$P_i(v = j) = \frac{\exp(u_{i,j})}{1 + \sum_{k \in r(i), k \neq m} \exp(u_{i,k})} \quad (2)$$

Here  $u_{i,j}$  denotes the utility (specified in the following subsection) for individual  $i$  to vote for party  $j$ .

Specifically, based on (1) the probability someone from Madrid votes for PP is expressed as<sup>5</sup>:

$$P_m(v = PP) = \frac{\exp(u_{m,PP})}{1 + \exp(u_{m,PP})} \quad (3)$$

Meanwhile, for an individual from *Catalonia*:

$$P_c(v = PP) = \frac{\exp(u_{c,PP})}{1 + \exp(u_{c,PP}) + \exp(u_{c,CiU})} \quad (4)$$

And, finally, for a voter from *Basque Country*:

$$P_b(v = PP) = \frac{\exp(u_{b,PP})}{1 + \exp(u_{b,PP}) + \exp(u_{b,PNV})} \quad (5)$$

Note that in the formal estimated probability for each voter, the denominator changes accordingly to her given choice set, (1).

The problem with (2) is that it does not say anything about  $p_1(v = CiU) = 0$  or  $p_2(v = PNV) = 0$ . Hence, "impossible" vote choices (zero probability) need to be defined separately, which makes the formula non-general and this poses additional complexities during the calculation of the

---

<sup>5</sup> *PSOE* is set as the base category.

model. This paper , then, proposes a generalization for VCL, that incorporates *impossible* vote choices.

Let's introduce *the filter (matrix)*,  $\Phi$ , so that  $\phi_{r(i)j} = I(j \in r(i))$ . In words,  $\phi_{r(i),j}$  shows whether party  $j$  is available in restricted set  $r(i)$ . Assume that the number of all possible  $r(i)$  is known,  $R$ , and the number of parties is  $P$ . For the tentative example defined in (1)  $|r(i)| = 3$  and  $R=4$ . Hence, the *filter* becomes:

$$\Phi_{R \times P} = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 1 & 1 & 1 & 0 \\ 1 & 1 & 0 & 1 \end{bmatrix} \quad (6)$$

Then, given the filter (6), (2) transforms to a general statement, which describes the voting probability for any combination of  $r(i)$  and  $j$ :

$$P_i(v = j) = \frac{\exp(u_{i,j})}{1 + \sum_{k \in r(i), k \neq m} \exp(u_{i,k})} \implies P_i(v = j) = \frac{\exp(u_{i,j})\phi_{r(i),j}}{1 + \sum_{k \in P, k \neq m} \exp(u_{i,k})\phi_{r(i),k}} \quad (7)$$

The generality is achieved because in (7):  $\phi_{r(i),j} = 0 \implies P_i(v = j) = 0$ . Hence, if party  $j$  is not in the restricted set  $r(i)$ , the probability that individual  $i$  chooses  $j$  becomes 0. (7) is very similar to the *multinomial logit regression* and is easier to implement<sup>6</sup> than is original Yamamoto's (2). Importantly, at this point, the *multinomial logit regression* may be explicitly

---

<sup>6</sup>Please, find more details on the proposed implementation in the Appendix.

specified as a partial case of VCL with  $\phi_{r(i),j} = 1, \forall i, j$ . Indeed if  $\phi_{r(i),j} = 1$  for all combinations of individuals and parties, then (7) becomes  $P_i(v = j) = \frac{\exp(u_{i,j})}{1 + \sum_{k \in P, k \neq j} \exp(u_{i,k})}, \forall i$ , which is exactly the formal definition of *multinomial logit regression*.

*Filter matrix in application: Spanish General Elections in 2008 and 2011*

The filter matrices ( $\Phi$ ) for the analysis of this paper are given in tables 15 and 16. *PSOE, PP, IU*, and *UPyD* competed in all regions in 2008 and 2011. while newly-formed *Compromis* - only in 2011. In 2008, only *Catalonia* and *Basque Country* had multiple parties competing in the elections: *CiU* and *ERC*, and *PNV* and *EA*, respectively. 4 more regions had one regional party competing: *CHA* in *Aragon*, *CC* in *Canary Islands*, *BNG* in *Galicia*, *Na-Bai* in *Navarra*. In 2011, a new nationalist Basque party, *Amaiur*, competed in *Basque Country* and *Navarra*. From 2008 to 2011, *Na-Bai* disappeared, while *Geroi-Bai* was formed and competed in 2011. Also, in 2011, *Asturias* had its regional party, *FAC*, making it to the national parliament.

### **3.2 Individual voting utility**

The crucial part of the *multinomial logit regression for varying choice sets* is the voting utility which individual  $i$  receives if she votes for  $j$ . In the subsection above, the individual voting utility was denoted as  $u_{i,j}$ . This paper employs a complex modification of *the voting spatial model with heterogenous exogenous valence*:

$$E(u_{i,j}|x_i, z_j) = \mu_j + \mu_{jr(i)} - \beta_{1,r(i)}(x_i^1 - z_j^1)^2 - \beta_{2,r(i)}(x_i^2 - z_j^2)^2, \beta_{1,r(i)} \geq 0, \beta_{2,r(i)} \geq 0 \quad (8)$$

As seen in (8),  $u_{i,j}$  depends on the individual ideological position,  $x_i$ , and the party ideological position,  $z_j$ . This paper assumes that  $x_i$  and  $z_j$  consist of the *central-periphery* and *socio-economic* components. Consequently,  $(x_i^1 - z_j^1)^2 = \delta_1$  and  $(x_i^2 - z_j^2)^2 = \delta_2$  are the squared ideological distances along the first and second ideological dimension between individual  $i$  and party  $j$ . Decrease of  $\delta_1$  ( $\delta_2$ ) by one unit leads to an increase of  $E(u_{i,j}|x_i, z_j)$  by  $\beta_{1,r(i)}$  ( $\beta_{2,r(i)}$ )<sup>7</sup>.

$\beta_{1,r(i)}$  and  $\beta_{2,r(i)}$  are the spatial coefficients, which reflect how *sensitive* individual  $i$  is to the changes in  $\delta_1$  and  $\delta_2$ . If  $\beta_{1,r(i)} > \beta_{2,r(i)}$  individual  $i$ 's voting utility is more sensitive to changes in the central-periphery dimension, and if  $\beta_{1,r(i)} < \beta_{2,r(i)}$  then *vice versa*. The ratio,  $\beta_{2,r(i)}/\beta_{1,r(i)}$ , shows how much more important the socio-economic ideological dimension in relation to the central-periphery ideological dimension is for individuals in  $r(i)$  on average.

The share of  $E(u_{i,j}|x_i, z_j)$  unexplained with the spatial component,  $-\beta_{1,r(i)}(x_i^1 - z_j^1)^2 - \beta_{2,r(i)}(x_i^2 - z_j^2)^2$ , is "captured" with the exogenous valence terms,  $\mu_j$  and  $\mu_{jr(i)}$ .  $\mu_j$  is the average exogenous valence of party  $j$  across all regions, while  $\mu_{jr(i)}$  reflects how different the exogenous valence of party  $j$  is in region,  $r(i)$ , relative to  $\mu_j$ . Because of the features of *multinomial*

---

<sup>7</sup>This follows from  $\frac{\partial E(u_{i,j}|x_i, z_j)}{\partial \delta_1} = -\beta_{1,r(i)}$  and  $\frac{\partial E(u_{i,j}|x_i, z_j)}{\partial \delta_2} = -\beta_{2,r(i)}$ .

*logit regression* (and, consequently, *multinomial logit regression for varying choice sets* as well) the exogenous valence of the *base* party is 0 (*PSOE* in the tentative example in the previous subsection). Hence, all exogenous valences are estimated relative to the exogenous valence of the base party,  $\mu_1$ , which is assumed to be zero.

## 4 Results

The estimation of the coefficients, representing the exogenous party valences and the spatial ideological sensitivity, of (8) is achieved in two stages. First, the political ideological scores for individuals and parties are constructed based on surveys from *Centro de Investigaciones Sociológicas (CIS)*. Party ideological positions are assumed to be mean ideological positions amongst those individuals in the sample who claimed to have voted for these parties. The following subsection presents the estimation of the ideological scores in detail. Next, ideological scores for individuals and parties are plugged-in the assumed voting utilities, (8), and *multinomial logit regression for the varying choice sets*<sup>8</sup>, (2), is estimated given the utilities. In the estimated model, the political ideological scores are the independent variables and the claimed party voted is the dependent variable.

---

<sup>8</sup>The models for both elections (2008 and 2011) were estimated with the use of the *r package jags*. The following holds for both years. 1) The total number of the iterations in each of the three chains was 12500 with the first 7500 burned. 2) According to the Raftery-Lewis diagnostic, 2 of 3 chains converged on the probability level of 0.95. 3) The scale reduction factors and the multivariate reduction factor do not exceed 1.1 according to the Gelman-Rubin diagnostic.

The second half of this section discusses the results of the estimation of (8). The discussion starts with the review of the obtained ideological spatial coefficients. Then, the paper focuses the exogenous party valences. Because of the space limit of the paper, results are presented only for some regions: the historical regions - *Catalonia*, *Basque Country*, and *Galicia*, and the central *Community of Madrid*, and non-nationalist *Andalusia*. The changes of the exogenous valences of the nationalist parties, *CiU*, *ERC*, *PNV*, *Amaiur*, and *BNG* are of special interest in this section, since they reflect the non-ideological part in the voters' motivation to vote for these parties.

#### 4.1 Political ideology: individual and party scores

The major variables of the analysis, the individual ideological positions, were derived from a *component factor analysis*<sup>9</sup> estimated for a number of questions coming from the surveys of *Centro de Investigaciones Sociológicas (CIS)* run in 2008 and 2011<sup>10</sup>. The analysis used only the questions aimed at reflecting the socio-economic and nationalist self-evaluations of the individuals in the sample (see the Appendix - *Survey Questions*). Two individual ideological scores - the left-right dimension and the central-periphery dimension - were assumed to be the hidden variables best explaining the questions

---

<sup>9</sup>via the *r* package *factanal*

<sup>10</sup>The original data were refined in the two steps. First, observations with missing or undefined variable for *party voted* were dropped. Second, for the remaining n=4551(2008) and n=4401(2011) the multiple imputation was performed via the *r* package *mice*.

from the sample and having the least possible mutual correlation<sup>11</sup>.

Tables 8 and 9 present the contributions of each question to the calculated individual ideological scores. The results for 2008 and 2011 are very similar, for some variables identical. Therefore most of the following discussion will to address both years at once. Most survey questions contribute to the coordinates in both dimensions in both years. Meanwhile, attitudes to government interventions in the economy and towards people of different origin or culture load only in the second dimension. Also, the nationalist self-identification loads only in the first dimension, so, according to the this analysis, has nothing to do with the right-left scale. This observation confirms the idea that in the modern research on Spanish politics, the socio-economic dimension and the central-periphery dimension tend to become less mutually attached, contrary to the former belief, that only one independent ideological dimension exists in Spain (Amat (2012)). However, despite the explicit minimization of the correlation between the axes, as tables 10 and 11 show, the ideological dimensions still correlate more strong (0.1 compared to around 0) than in similar CFAs in the spatial voting analysis with social and economic dimensions (Schofield and Sened (2006)). The negative correlation points to the fact that in Spain a higher level of peripheral nationalism is associated with more non-conservative, or left, socio-economic views. Overall, the variance in the social-economic axis is slightly lower than that in the central-

---

<sup>11</sup>In the other words, their correlation was minimized, so the basis in the two-dimensional space of these two hidden variable is considered orthogonal.

periphery axis (see tables 10 and 11). Another interesting observation is that question on the voters' preferred extent of decentralization loads significantly more on the first dimension, even through it is an economic issue, since it concerns the tax system. Also, a higher level of tolerance towards *ETA* loads negatively on the scale of nationalism.

Tables 1 and 2 show the means of the ideological scores grouped by voted parties. As seen, according to the analysis, in both 2008 and 2011, *PP* is the most extreme right party, while *IU* - the most extreme left party. In 2011, *PP* and *IU* converged slightly towards the mean. In terms of the nationalist scale, *ERC* was the most extreme in 2008, while the newly established Basque party *Amaiur* was the most extreme in 2010. Interestingly, all state-level parties have not almost changed their positions between 2008 and 2010, while there has been certain shifts among the regional parties in terms of the central-periphery dimensions - *ERC* became less extreme, while *BNG* became more so.

#### General Spanish Elections, 2008

axis/party	PSOE	PP	IU	UPyD	CiU	ERC	PNV	BNG
left-right	-0.17	0.42	-0.57	-0.32	0.14	-0.28	0.16	-0.33
central-periphery	0	-0.37	0.67	-0.30	1.13	2.13	1.72	0.77

Table 1. General Spanish Elections, 2008

axis/party	PP	PSOE	IU	UPyD	CiU	Amaiur	PNV	BNG	ERC
left-right	0.26	-0.17	-0.51	-0.22	0.16	-0.34	-0.18	-0.11	-0.32
central-periphery	-0.32	-0.01	0.34	-0.24	1.29	2.15	1.57	1.92	0.88

Table 2. General Spanish Elections, 2011

The best way to capture the ideological differences across the regions is to look at the density plots<sup>12</sup>. As figures 2 and 7 show, between the General election of 2008 and that of 2011 the electorate’s preferences on average converged to the mean. While in 2008, two ideological peaks existed, one of which was significantly to the left of the nationalist mean, in 2011 only one peak was left. The plots for *Basque Country* (figure 4 and 9), *Community of Madrid* (figure 3 and 8), *Andalusia* (figure 5 and 10), and *Catalonia* (figure 6 and 11) present the ideological distributions for the regions. Predictably, *Catalonia* and *Basque Country* exhibit a high level of a peripheral nationalism. Meanwhile, in terms of the socio-economic scale, *Basque country* looks slightly leftist, while *Catalonia* is almost neutral.

## 4.2 Spatial ideological sensitivity

This section elaborates on the spatial component,  $-\beta_{1,r(i)}(x_i^1 - z_j^1)^2 - \beta_{2,r(i)}(x_i^2 - z_j^2)^2$ , of the individual voting utilit. This component controls for the political ideology in the voting motivations of the individuals represented with the utility function. Given the model, the part of the voting behavior unex-

<sup>12</sup>Means of the scores by region can be found in tables ?? and ??.

plained by the political ideology is captured with the *exogenous party valence*,  $\mu_j + \mu_{jr(i)}$ , which is discussed in the following subsection. As mentioned before, the spatial ideological sensitivity coefficients,  $\beta_{1,r(i)}$  and  $\beta_{2,r(i)}$ , reflect how strongly people react to an increase in the ideological distance between them and the parties. The higher these coefficients are the more costly it is in terms of votes for the parties that deviate from the voters' preferences. The ratio of the coefficients,  $\beta_{2,r(i)}/\beta_{1,r(i)}$ , shows how much more sensitive, by region  $r(i)$ , the voters are in the socio-economic ideological dimension than to the central-periphery dimension.

Tables 17 and 18 present the estimates for the spatial coefficients for all Spanish regions in 2008 and 2011. Both tables present the ratio of the socio-economic sensitivity coefficient to the central-periphery sensitivity coefficient. These tables confirm, for most regions, the general finding in the existing literature that people in Spain perceive the left-right ideological dimension as more important than nationalism,  $\beta_{2,r(i)}/\beta_{1,r(i)} > 1$  (e.g. Fernandez Albertos (2002), Heller (2002)). As seen, in most regions the changes in the ratio from 2008 to 2011 were minor, and on average the ratio stood the same, 1.37. The same is true for the averages for  $\beta_{1,r(i)}$ , 0.76, and  $\beta_{2,r(i)}$ , 1.05. Interestingly, most of the spatial coefficients for the first dimension either fall in the range of 0.4-0.6 or 0.8-1.0, while for the second dimension the spatial coefficients are almost uniformly distributed from 0.64 and 0.70 in *Navarre*, to 1.59 and 1.56 in *Aragon*, in 2008 and 2011 respectively.

Both highly nationalist regions, *Catalonia* and *Basque Country*, fall

into the group with the smaller spatial sensitivity in the central-periphery dimension, 0.57 in *Catalonia* and 0.53 in *Basque Country* in 2008; 0.58 and 0.52 in 2011 respectively, and have a ratio  $\beta_{2,r(i)}/\beta_{1,r(i)}$  far above the mean 1.37: 1.92 in *Catalonia* and 2.26 in *Basque Country* in 2008; and 1.82 and 2.17 in 2011 respectively. Based on these ratios, *Basque Country* is significantly more electorally sensitive to the moves of the parties along the socio-economic axis than the nationalist axis. However, since  $\beta_{1,Catalonia}$  and  $\beta_{1,BasqueCountry}$  are close, this is mostly a consequence of the differences of the sensitivity in the left-right ideological dimension, which is significantly higher in *Basque Country* than in *Catalonia*.

Based on the estimates of the spatial ideological sensitivity (tables 17 and 18), the ideological score means by region (tables 12 and 13) and the density plots 2 - 11, it may be concluded that between the General Elections in 2008 and the General Elections in 2011 no significant changes in terms of the political ideology occurred in Spain.

Meanwhile, a more detailed analysis, namely the correlations between the data presented in tables 12, 13, 17, and 18, might provide certain interesting results (see table 3) in terms of the relation of the ideological sensitivity and the mean ideology by region. The most striking observation is that regions with more right-wing ideology are less sensitive to the changes of the positions of the parties along the nationalist ideological dimension. Another important observation is the growth in the correlation between the mean nationalist ideological score and the spatial ideological sensitivity in relation to

the nationalist dimension, from the "noisy" score of 0.08 to the more meaningful score of 0.24. Lastly, the magnitude of the change in the ratio  $\beta_2/\beta_1$  has a positive correlation with the nationalist views, 0.45, and negative association with the right-wing views, -0.41.

mean regional ideological score	2008			2011			$\Delta(\beta_2/\beta_1)$
	$\beta_1$	$\beta_2$	$\beta_2/\beta_1$	$\beta_1$	$\beta_2$	$\beta_2/\beta_1$	
central-periphery	0.08	-0.18	0.21	0.24	0.16	-0.10	0.45
socio-economic	-0.43	-0.05	-0.22	-0.45	-0.19	0.13	-0.41

Table 3. Correlations between mean individual ideological scores by region and regional spatial ideological sensitivity

### 4.3 Exogenous party valence

As mentioned in the previous subsection, in this analysis, the *exogenous party valence*,  $\mu_j + \mu_{jr(i)}$  reflects the share of voting motivation of the individuals in the sample that could not have been explained with the *spatial ideological component*,  $-\beta_{1,r(i)}(x_i^1 - z_j^1)^2 - \beta_{2,r(i)}(x_i^2 - z_j^2)^2$ , given individual voting utility. As shown in the previous subsection, no major changes of political ideology occurred in Spain from the General Elections in 2008 to the General Elections in 2011. Hence the observed changes of the electoral outcomes in 2011 relative to 2008 must be because of the changes of the *exogenous party valence*. The aim of this subsection is to provide evidence for this, pointing out how these changes in *valence* were distributed across parties.

Tables 19 and 20 show the estimates for the *exogenous party valence* for 2008 and 2011 respectively. The first column provides state-level party valences. Other columns provide estimates for the differences between state-level party valence and regional party valence for those regions where this party competed. The blank cells in the table indicate regions where a given party did not run. For both years, *PSOE* was employed as a base category. In 2011 *PP* won the elections, and its state-level valence relative to *PSOE* increased from -0.42 to 0.59. All other presented parties (except *BNG*, the valence of which fell from -0.99 to -1.94), experienced a rise in the *exogenous valence* as well, similar to that of *PP* relative to *PSOE*. However, this change is mostly unequal to the change in *PP* valence. Hence, it can be said that the overall distribution of *exogenous party valence* changed between the elections in 2008 and 2011, but *PP* did not completely "substitute" for the base *PSOE* in valence terms.

Starting from the state-level non-major parties, *UPyD* experienced the most striking increase: its valence grew from -3.72 to -1.81, which is more than double. Meanwhile, this party has a significantly lower valence in *Catalonia* and *Galicia*, by -0.33 and -0.87, respectively, and a higher valence in *Community of Madrid*, by 0.80, in 2011. Interestingly, these regional differences increased substantially from 2008 to 2011. For another non-major state-level party *IU*, the growth of the valence was substantial as well: from -2.42 to 1.23.

Among the regional-level parties, *ERC* experienced the most substan-

tial growth: from -3.03 to -1.90. Strikingly, the regional difference for *ERC*, which competes also in *Valencia*, in *Catalonia*, became huge in 2011 - *-1.41* (which is probably why its electoral result did not grow from 2008 to 2010). *CiU*'s valence grew by about the same amount as that of *PP*: from -2.41 to -1.57. *Amaiur* was a new party, so the fact that its valence was about the same as of the winner *PP* in 2011 is impressive. *PNV* did not experience a significant growth in terms of valence. While its magnitude grew from -0.42 to 0.00, the errors were larger. Lastly, as already mentioned, *BNG* experienced an impressive decrease: from -0.99 to -1.94.

Table 4 provides a summary of the relation between votes and *exogenous party valence* for the Spanish General Elections in 2008 and 2010, based on the data presented in tables 6, 7, 19, and 20. As seen, the correlation between the number of votes and party valence decreased from 2011 to 2008, from 0.60 to 0.44. However, among the parties participating in both elections, there is a substantial correlation between the changes in party valence and the change in the number of votes between the elections, 0.39. Also, the party valence in 2011 and the change in votes are correlated almost the same, 0.41. However, the total number of votes in 2011 and the change in valence are not significantly correlated, -0.06.

	2008	2011	
	$\mu_j$	$\mu_j$	$\Delta_{2011-2008}\mu_j$
votes	0.60	0.44	-0.06
$\Delta_{2011-2008}$ votes		0.41	0.39

Table 4. Correlations between votes and exogenous party valence

The analysis above shows that, despite that the overall effect of the *exogenous party valence* on the number of votes decreased from 2008 to 2011, the changes between the electoral results in 2008 and 2011 is a consequence of the *exogenous party valences* in 2011. However, for one party this effect was especially strong, *UPyD*. For regional parties, this is less clear. Overall, seemingly, a few parties benefited, because of their valence, from the former *PSOE* voters, who did not swing to *PP* in 2011. These parties were the non-marginal state-level parties *UPyD* and *UI* and the regional parties *CiU* and *Amaiur*.

## 5 Conclusion

The paper has shown that the rise in votes experienced by certain non-marginal minority parties in Spain from the General Elections in 2008 to the General Elections in 2011 is a consequence of an increase in *exogenous party valence*. As said in the introduction, a possible interpretation for this change is an increase in voter trust, meaning, that the minority parties are perceived better than the major parties in terms of their capacity to deliver deserved policy outcomes (Clarke (2009)). The shift of a significant number of votes away from the major parties was surprising within the historically established bipartisan political structure of Spain. And, it, probably, signified a general crisis in the political system (Navarro (2014)), as may be confirmed by flow

of the political events in Spain since 2011.

First of all, a general frustration in the corrupt and inefficient political decisions and political establishment, led to the first demonstration (on May 15 2011) of the 15-M (or anti-austerity) movement that thereafter organized a substantial number of public demonstrations all over Spain. At the same time, in Catalonia, which "generally never believed in a multinational Spain" (Navarro (2014)), huge rallies for self-determination took place. Having reached its peak during a huge rally on 11 September 2014, when 1,800,000 went to the streets of Barcelona; Catalonia's main intention was to conduct a self-determination referendum. However, as already mentioned in the beginning, this referendum did not happen, since it was considered unconstitutional by the central Constitutional court.

Second, as a development of the 15-M movement, a new political force - the party *Podemos* - emerged in 2014. Reflecting the general attitudes during the protests of 2011-2014, *Podemos*, founded by a university professor *Pablo Iglesias*, was a left-wing party with no roots in the old political establishment. Since its appearance, *Podemos* has exhibited a sharp growth in its popularity. Indeed, in February 2015, 27.7% claimed that they would vote for *Podemos* in the upcoming General Elections in the end of 2015, while only 20.9% were going to vote for the current ruling party, *PP* (Metrosopia (2015)). An impressive existing achievement of *Podemos* is its successful performance during the country's elections to the European Parliament in 2014 May, just a few months after the party was created. *Podemos* got 8 % of the voter

support and won 5 seats. This is one seat more than *UPyD* and two seats more than *CiU*. Meanwhile, *PP* and *PSOE* got 16 and 14 seats respectively (Navarro (2014)).

To sum up, the crisis in the voter trust in the performance of the majority parties *PP* and *PSOE* seems, first, led in the General Elections in 2011 to an increase in the exogenous party validity of certain minority parties, namely, *UPyD* and, to a smaller extent, *CiU*. After 2011, the crisis of trust provoked massive rallies and, eventually, the appearance of a new growing political force, *Podemos*. A logical continuation of this research will be to apply this paper's model to the upcoming elections of 2015 to explore how the arrival of *Podemos* has affected the ideological scope of Spain and the distribution of the *exogenous valence* among the Spanish parties.

## 6 References

[1] Francesc Amat. Party competition and preferences for inter-regional redistribution in Spain. *South European Society and Politics*, 17(3):449–465, 2012.

[2] Stephen Ansolabehere and James M Snyder Jr. Valence politics and equilibrium in spatial election models. *Public Choice*, 103(3-4):327–336, 2000.

[3] Laia Balcells i Ventura. ¿ es el voto nacionalista un voto de proximidad o un voto de compensación? una nueva aproximación. *SespecialT al*

voto en dos dimensiones. *Revista española de ciencia política*, (16):61–88, 2007.

[4] Will M Bennis, Douglas L Medin, and Daniel M Bartels. The costs and benefits of calculation and moral rules. *Perspectives on Psychological Science*, 5(2):187–202, 2010.

[5] Eduard Bonet, Santiago Pérez-Nievas Montiel, and María José Hierro Hernández. España en las urnas: territorialización del voto e identidad nacional en las elecciones de 2008. In *Elecciones generales 2008*, pages 331–364. Centro de Investigaciones Sociológicas (CIS), 2010.

[6] Angus Campbell, Philip E Converse, Warren E Miller, and E Donald. *The american voter*, 1966.

[7] Harold D Clarke. Performance politics and the British voter, chapter *The theory of valence politics*, pages 31–52. Cambridge University Press, 2009.24

[8] Harold D Clarke, Thomas J Scotto, and Allan Kornberg. *Electoral studies*, 30(3):438– 449, 2011.

[9] Espana: Ministerio del Interior. Consulta de resultados electorales: Congreso. <http://www.infoelectoral.interior.es/min/>, 2015. Accessed March 16, 2015.

[10] Elias Dinas. Left and right in the basque country and catalonia: the meaning of ideology in a nationalist context. *South European Society and Politics*, 17(3):467–485, 2012.

[11] Jay K Dow and James W Endersby. Multinomial probit and

multinomial logit: a comparison of choice models for voting research. *Electoral studies*, 23(1):107–122, 2004.

[12] Anthony Downs. *An economic theory of democracy*. 1957.

[13] James M Enelow and Melvin J Hinich. *The spatial theory of voting: An introduction*. CUP Archive, 1984.

[14] Paloma Aguilar Fernández and Ignacio Sánchez-Cuenca Rodríguez. ¿gestión o representación?: Los determinantes del voto en contextos políticos complejos. *Estudios/Working Papers (Centro de Estudios Avanzados en Ciencias Sociales)*, (220):1, 2006.

[15] José Fernández Albertos. Votar en dos dimensiones: el peso del nacionalismo y la ideología en el comportamiento electoral vasco, 1993-2001. *Revista Española de Ciencia Política*, 6(1):153–181, 2002.

[16] Maria Gallego, Norman Schofield, Kevin McAlister, and Jee Seon Jeon. The variable choice set logit model applied to the 2004 canadian election. *Public Choice*, 158(3- 4):427–463, 2014.

[17] Andrew Gelman, John B Carlin, Hal S Stern, David B Dunson, Aki Vehtari, and Donald B Rubin. *Bayesian data analysis*. CRC press, 2013.

[18] William B Heller. Regional parties and national politics in europe spain’s estado de las autonomías, 1993 to 2000. *Comparative Political Studies*, 35(6):657–685, 2002.

[19] Harold Hotelling. Stability in competition. *The Economic Journal*, 39(153):pp. 41–57, 1929.

[20] Elena Labzina and Norman Schofield. *The Political Economy of*

Governance, chapter Application of the Variable Choice Logit Model to the British General Elections of 2010. Springer, 2015.

[21] Enric Martínez-Herrera. From nation-building to building identification with political communities: consequences of political decentralisation in Spain, the basque country, catalonia and galicia, 1978–2001. *European Journal of Political Research*, 41(4):421–453, 2002.

[22] Enric Martínez-Herrera and Thomas Jeffrey Miley. The constitution and the politics of national identity in spain. *Nations and nationalism*, 16(1):6–30, 2010.

[23] A Mas-Collel, Michael D Whinston, and Jerry R Green. *Microeconomic theory*, 1995.

[24] Metroscopia. Spanish general election: 8 feb poll.

"<http://metapolls.net/2015/02/10/spanish-general-election-8-feb-2015-poll-metroscopia/>". VQdFZ47F-1Q, 2015. Accessed March 16, 2015.

[25] Jordi Muñoz. From national-catholicism to democratic patriotism? democratization and reconstruction of national pride: the case of spain (1981–2000). *Ethnic and Racial Studies*, 32(4):616–639, 2009.

[26] Vicenc Navarro. Lo que esta pasando en catalunya y en espana. "<http://www.vnavarro.org/?p=11312>", September 2014. Accessed December 28.

[27] Xosé-Manoel Núñez. What is spanish nationalism today? from legitimacy crisis to unfulfilled renovation (1975–2000). *Ethnic and Racial Studies*, 24(5):719–752, 2001.

[28] John Palmer. The rise of far right parties across europe is a chilling echo of the 1930s.

"<http://www.theguardian.com/commentisfree/2013/nov/15/far-right-threat-europe-integration>", 2013. Accessed December 28, 2014.

[29] Santiago Pérez-Nievas and Marta Fraile. Is the Nationalist Vote Really Nationalist?: Dual Voting in Catalonia 1980-1999. Number 147. Instituto Juan March de Estudios e Investigaciones, 2000.

[30] Norman Schofield. Valence competition in the spatial stochastic model. *Journal of Theoretical Politics*, 15(4):371–383, 2003.

[31] Norman Schofield and Itai Sened. Multiparty democracy: elections and legislative politics. Cambridge University Press, 2006.

[32] Norman Schofield and Maria Gallego. The Convergence Coefficient across political systems. *Probability and Statistics* (Published: December ,2013) [.http://dx.doi.org/10.1155/2013/653035](http://dx.doi.org/10.1155/2013/653035).28pp.

[33] D. E Stokes. Electoral Politics, chapter Valence Politics, page 141U64. Oxford: Clarendon Press, 1992.

[34] Donald E Stokes. Spatial models of party competition. *The American Political Science Review*, pages 368–377, 1963.

[35] Teppei Yamamoto. A multinomial response model for varying choice sets, with application to partially contested multiparty elections. Technical report, Working paper, 2011.

# Appendix

## Survey Questions (the same in 2008 and 2011)

### 1. **Multiculturalism/Immigration issue**

Some people think it is very positive that people of different origin, culture and religion coexist in the same country (these people would be at the point 0 on the scale). Others think that the presence of migrants can endanger the values and the culture here (these would be at point 10), and there are others who would be at intermediate positions. What place would you stand? (0-10)

### 2. **Government intervention in economy**

Some people think they should improve public services and benefits, even if they pay more taxes (these people would be at the point 0 on the scale). Others think it's more important to pay less tax, even if it means reducing public services and social benefits (these would be at point 10), and there are others who would be at intermediate positions. . What place would you stand? (0-10)

### 3. **Anti-terrorist policy issue**

Some people think that the only way to stop is defeat ETA policing (these people would be at the point 0 on the scale). Others think that to end ETA also need dialogue (these would be at point 10), and there are others who would be at intermediate positions. What place would

you stand? (0-10)

#### 4. **Conservative values scale**

Some people believe that the key is to defend our traditional religious and moral values (these people would be at the point 0 on the scale), while others think the key is to defend the freedom of the individual to be and believe what you want (these would be at point 10), and there are others who would be at intermediate positions. What place would you stand?(0-10)

#### 5. **Decentralization**

I will now present some alternative formulas for the organization of the State in Spain. Tell me, please, what do you prefer?? (0-4)

- Just the main state without autonomous regions
- The main state without autonomous regions as nowadays
- The main state without autonomous regions more independent than nowadays
- The main state with autonomous regions having an easy legal option to become independent

#### 6. **Nationalist self-identification**

Which of the following statements would you say best expresses your feelings? (0-4)

- I feel only Spanish
- I feel more Spanish than ...
- I feel as Spanish as ...
- I feel more ... than Spanish
- I feel only ...

### 7. **Proudness to be Spanish**

To what extent would you say that you are proud to be Spanish: very proud, proud, somewhat proud or not proud? (0-3)

cid	name	historical nationalities <sup>13</sup>	observations 2008	observations 2011
1	Andalusia	55	1,262	1,225
2	Aragon	55	263	236
3	Asturias	55	128	163
4	Balearic Islands	55	172	137
5	Canary Islands	55	356	324
6	Cantabria	55	99	136
7	Castilla-La Mancha	55	292	370
8	Castile and Leon	55	473	472
9	Catalonia	51	694	696
10	Valencian Community	55	577	410
11	Extremadura	55	199	190
12	Galicia	51	511	525
13	Community of Madrid	55	374	432
14	Region of Murcia	55	190	176
15	Navarre	55	75	147
16	Basque Country	51	381	362
17	La Rioja	55	37	81
		6,083	6,082	

Table 5. Autonomous communities and regions of Spain

<sup>13</sup> Inherited from the Franco's regime

pid	name	regional	provinces	observations	percentage	election
1	PSOE	55		2,455	53.94	43.75
2	PP	55		1,432	31.47	39.94
3	IU (ICV in Catalonia)	55		215	4.72	3.77
4	UPyD	55		66	1.45	1.19
5	CiU	51	Catalonia	82	1.80	3.03
7	PNV	51	Basque Country	62	1.36	1.19
8	BNG	51	Galicia	42	0.92	0.83
6	ERC	51	Catalona, Valencia	40	0.88	1.16
9	CC	51	Canary Islands	28	0.53	0.68
10	EA	51	Basque Country	12	0.23	0.20
11	CHA	51	Aragon	9	0.17	0.15
12	Na-Bai	51	Navarra	12	0.23	0.24
13	<i>Other</i>			96	1.82	3.04

Table 6. Parties participating in General Elections in 2008

pid	name	regional	provinces	observations	percentag
1	PP	55		2,030	46.09
2	PSOE	55		1,280	29.06
3	IU (ICV in Catalonia)	55		344	7.81
4	UPyD	55		220	5.00
5	CiU	51	Catalonia	123	2.79
6	Amaiur	51	Navarra, Basque Country	71	1.61
7	PNV	51	Basque Country	55	1.25
8	BNG	51	Galicia	44	1.00
9	ERC	51	Catalonia, Valencia	42	0.95
10	CC	51	Canary Islands	14	0.32
11	Compromis Equo	55		48	1.09
12	FAC	51	Canary Is., Asturias, Valencia	11	0.25
13	Geroa Bai	51	Navarra	21	0.48
14	CHA	51	Aragon	4	0.09
15	<i>Other</i>			96	2.20

Table 7. Parties participating in General Elections in 2011

		central-periphery	socio-economic	uniqueness
1	Multiculturalism/Immigration issue		0.649	0.575
2	Government intervention in economy		0.415	0.826
3	Anti-terrorist policy issue (ETA)	-0.216	0.527	0.676
4	Conservative values scale	0.339	-0.370	0.748
5	Decentralization	0.584	-0.145	0.638
6	Nationalist self-identification	0.582		0.656
7	Proudness to be Spanish	0.670	-0.128	0.535
	SS loadings	1.296	1.050	
	Proportion Variance	0.185	0.150	
	Cumulative Variance	0.185	0.335	

Table 8. CFA: Factor loadings for 2008

		central-periphery	socio-economic	uniqueness
1	Multiculturalism/Immigration issue		0.636	0.575
2	Government intervention in economy		0.425	0.826
3	Anti-terrorist policy issue (ETA)	-0.225	0.514	0.676
4	Conservative values scale	0.422	-0.228	0.748
5	Decentralization	0.588	-0.136	0.638
6	Nationalist self-identification	0.629		0.656
7	Proudness to be Spanish	0.666	-0.107	0.535
	SS loadings	1.422	0.934	
	Proportion Variance	0.203	0.133	
	Cumulative Variance	0.203	0.337	

Table 9. CFA: Factor loadings for 2011

	central-periphery	socio-economic
central-periphery	0.654	-0.104
socio-economic	-0.104	0.585

Table 10. CFA: Correlation matrix for the scores, 2008

	central-periphery	socio-economic
central-periphery	0.680	-0.095
socio-economic	-0.095	0.558

Table 11. CFA: Correlation matrix for the scores, 2011

cid	name	historical nationalities	nationalist	left-right
1	Andalusia	55	-0.12	-0.12
2	Aragon	55	-0.20	-0.05
3	Asturias	55	-0.17	-0.16
4	Balearic Islands	55	0.14	0.08
5	Canary Islands	55	0.04	0.00
6	Cantabria	55	-0.13	-0.21
7	Castilla-La Mancha	55	-0.36	0.15
8	Castile and Leon	55	-0.38	0.07
9	Catalonia	51	0.66	-0.02
10	Valencian Community	55	-0.17	0.05
11	Extremadura	55	-0.19	0.14
12	Galicia	51	0.10	-0.04
13	Community of Madrid	55	-0.25	-0.25
14	Region of Murcia	55	-0.28	0.27
15	Navarre	55	0.65	-0.24
16	Basque Country	51	1.05	-0.28
17	La Rioja	55	0.01	-0.08
			0.00	0.00

Table 12. Ideological means by region: 2008

cid	name	historical nationalities	nationalist	left-right
1	Andalusia	55	-0.12	-0.01
2	Aragon	55	-0.27	0.27
3	Asturias	55	-0.24	0.10
4	Balearic Islands	55	0.01	0.03
5	Canary Islands	55	0.06	0.09
6	Cantabria	55	-0.31	-0.06
7	Castilla-La Mancha	55	-0.31	0.03
8	Castile and Leon	55	-0.45	0.11
9	Catalonia	51	0.69	0.01
10	Valencian Community	55	-0.17	0.04
11	Extremadura	55	-0.15	0.11
12	Galicia	51	0.05	0.03
13	Community of Madrid	55	-0.28	-0.30
14	Region of Murcia	55	-0.20	0.13
15	Navarre	55	0.74	-0.11
16	Basque Country	51	1.08	-0.27
17	La Rioja	55	-0.27	0.04
			0.00	0.00

Table 13. Ideological means by region: 2011

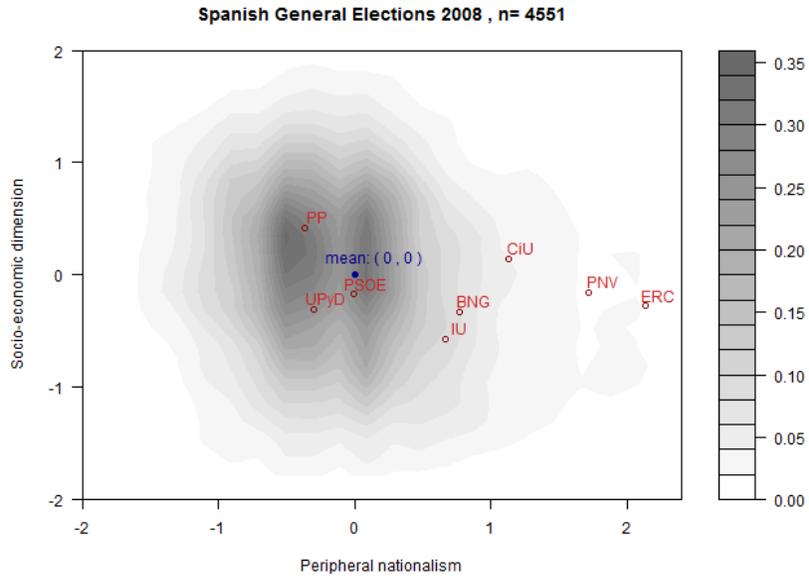


Figure 2: Figure 2. Density distribution of the individual ideological positions

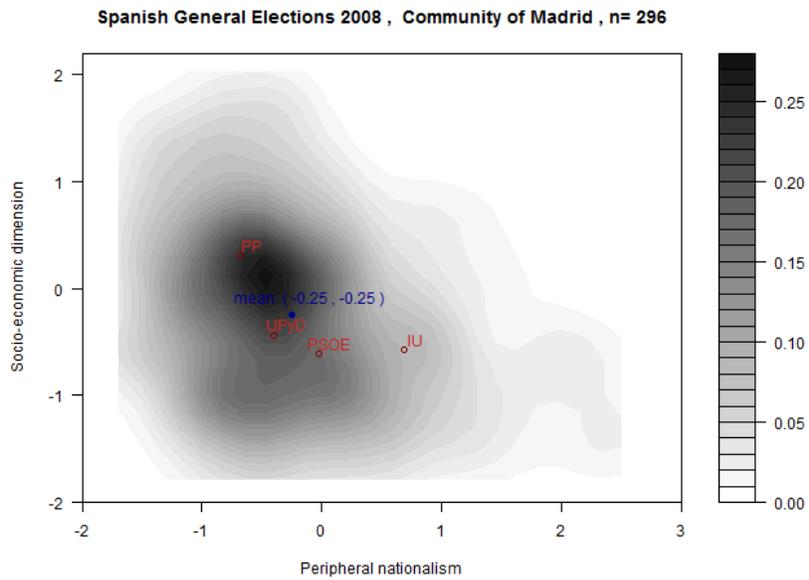


Figure 3: Figure 3. Density distribution of the individual ideological positions

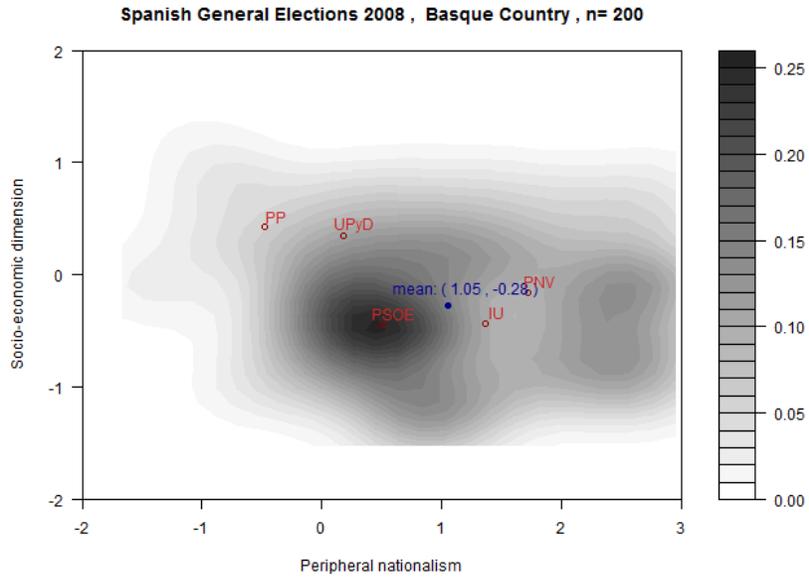


Figure 4: Figure 4. Density distribution of the individual ideological positions

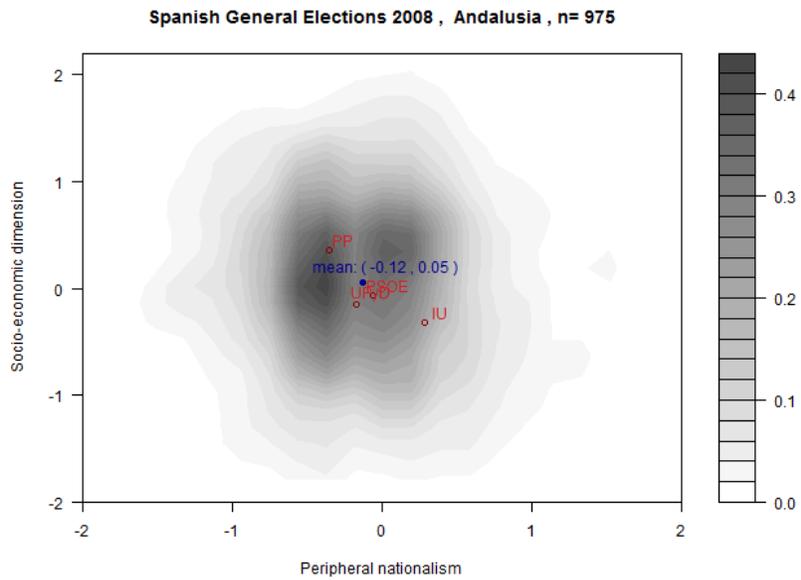


Figure 5: Figure 5. Density distribution of the individual ideological positions

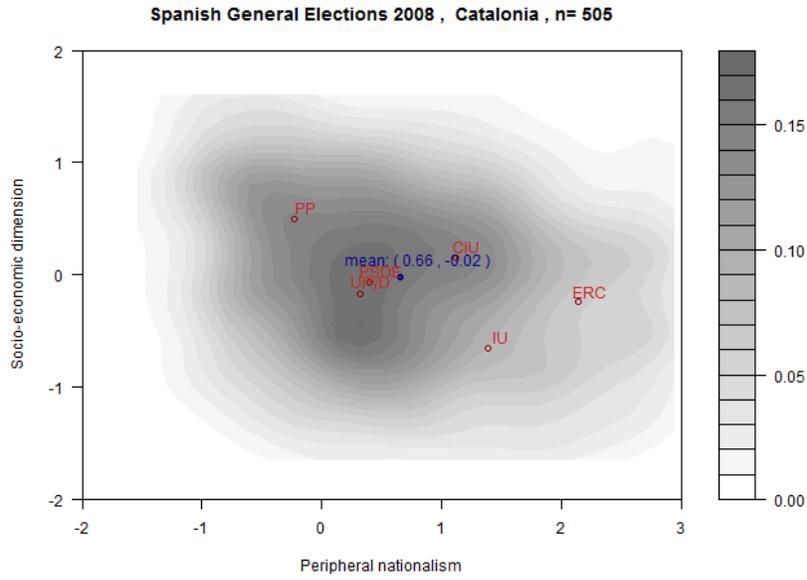


Figure 6: Figure 6. Density distribution of the individual ideological positions

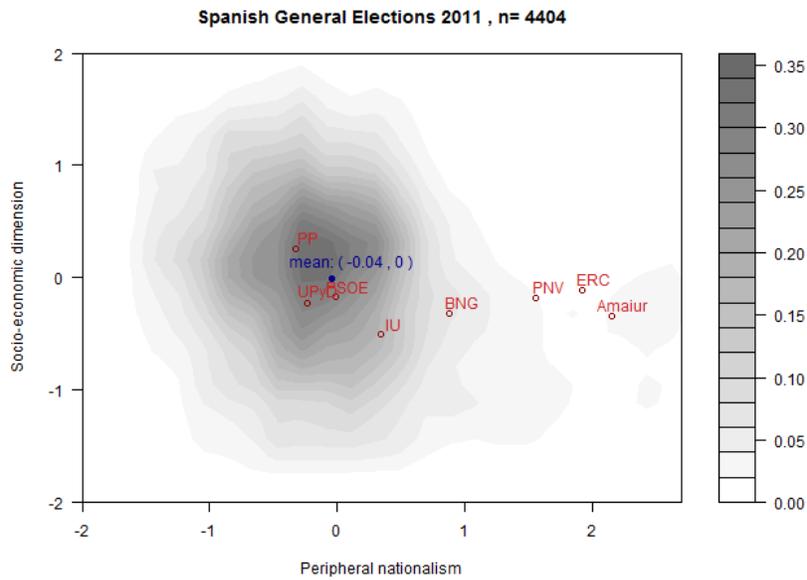


Figure 7: Figure 7. Density distribution of the individual ideological positions

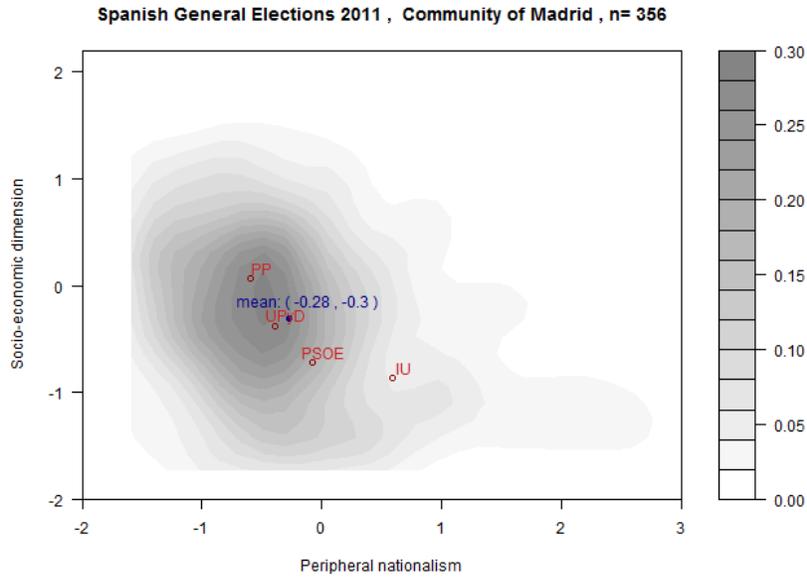


Figure 8: Figure 8. Density distribution of the individual ideological positions

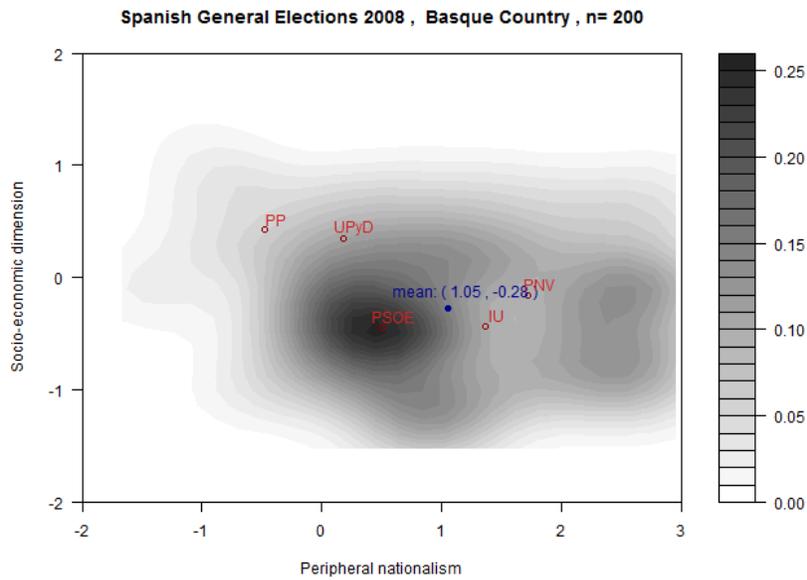


Figure 9: Figure 9. Density distribution of the individual ideological positions

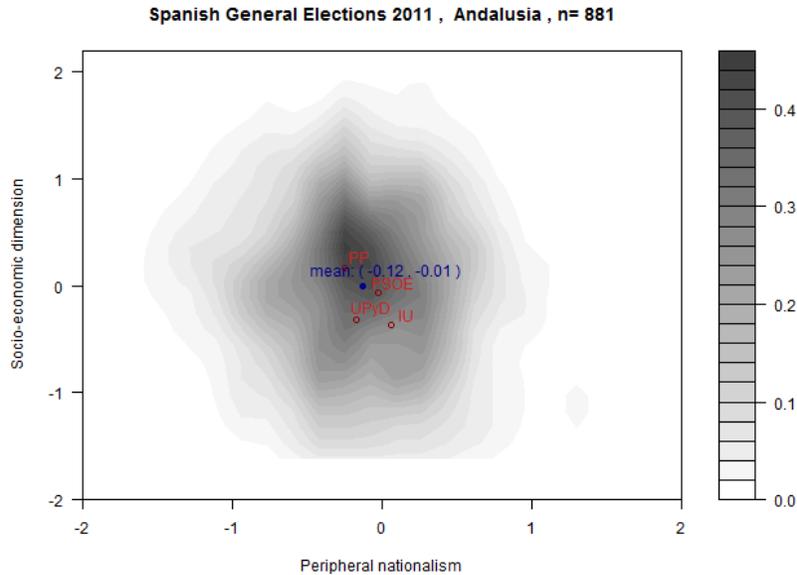


Figure 10: Figure 10. Density distribution of the individual ideological positions

## Implementation of the VCL

The *varying choice logit* with the individual voting utility function, for which section 3 provides a theoretical description, was implemented through the Bayesian approach via Gibbs sampling (Gelman et al (2013)) in the *r package rjags* with R version 3.0.3.

In the beginning of the computational analysis, all estimated coefficients for the main formula were assigned the commonly recommended uninformative normal priors with their variances distributed inverse-gamma (Gelman et al (2013)):

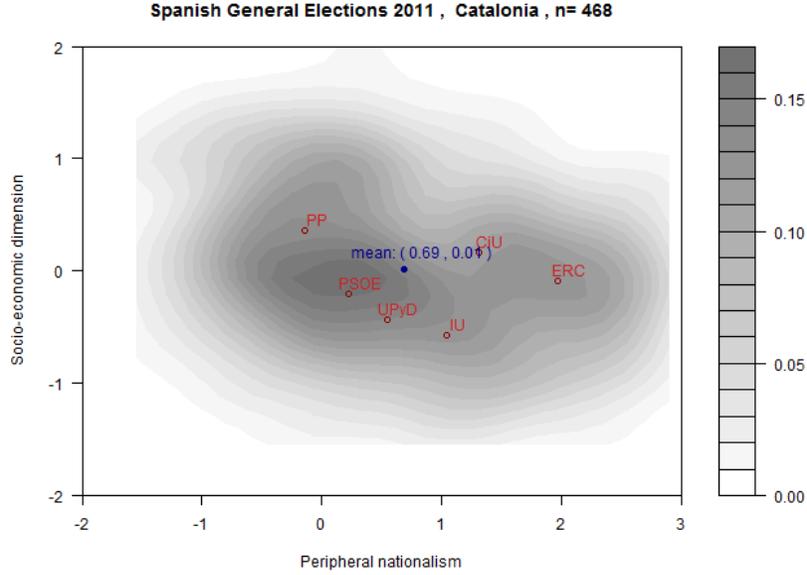


Figure 11: Figure 11. Density distribution of the individual ideological positions

$$\beta_{t,r(i)} \sim \mathcal{N}(0, \gamma_{\beta}), t \in \{1, 2\}, \forall i$$

$$\mu_p \sim \mathcal{N}(0, \gamma_{\mu_1}), p \in P$$

$$\mu_{p,r(i)} \sim \mathcal{N}(0, \gamma_{\mu_2}), p \in P, \forall i$$

$$\gamma_{beta} \sim Inv - Gamma(0.1, 0.1)$$

$$\gamma_{mu_1} \sim Inv - Gamma(0.1, 0.1)$$

$$\gamma_{mu_2} \sim Inv - Gamma(0.1, 0.1)$$

The model graph for the analysis consisted of 591,480 nodes for the

data on General Spanish Elections in 2008; and 664,432 for 2011. The total number of the iterations in each of the three chains for each of the analysis was 12500 with the first 7500 burned. Table 15 presents the deviance statistics for this estimation.

	2008	2011
Mean deviance	8,338	10,143
Penalty	89.83	108.5
Penalized deviance	8,428	10,251

Table 14. Deviance statistics for VCL

Convergence statistics.

- ***Spanish General Elections in 2008***

*The Gelman-Rubin diagnostic.*

All points estimates for the *potential scale reduction factors* for the parameters did not exceed 1.04, while the upper confidence interval estimates were less than 1.15. For most of the parameters both point estimates and the upper confidence interval were 1.0. *The multivariate potential scale reduction factor* was 1.09.

*The Raftery-Lewis diagnostic.*

Two of three chains converged on the probability level of 0.95.

- ***Spanish General Elections in 2011***

*The Gelman-Rubin diagnostic.*

All points estimates for the *potential scale reduction factors* for the parameters did not exceed 1.07, while the upper confidence interval estimates were less than 1.2<sup>14</sup>. For most of the parameters both point estimates and the upper confidence interval were 1.0. *The multivariate potential scale reduction factor* was 1.09.

*The Raftery-Lewis diagnostic.*

Two of three chains converged on the probability level of 0.95.

---

<sup>14</sup>According to the Gelman-Rubin diagnostic, the upper confidence interval for the potential reduction factors for  $\mu_7$  is 1.20, for the rest of the coefficients the upper C.I for their potential reduction factor is less than 1.10.

	PSOE	PP	IU	UPyD	CiU	ERC	PNV	BNG	CC	EA	CHA
Andalusia	1	1	1	1	0	0	0	0	0	0	0
Aragon	1	1	1	1	0	0	0	0	0	0	1
Asturias	1	1	1	1	0	0	0	0	0	0	0
Balearic Islands	1	1	1	1	0	0	0	0	0	0	0
Canary Islands	1	1	1	1	0	0	0	0	1	0	0
Cantabria	1	1	1	1	0	0	0	0	0	0	0
Castilla-La Mancha	1	1	1	1	0	0	0	0	0	0	0
Castile and Leon	1	1	1	1	0	0	0	0	0	0	0
Catalonia	1	1	1	1	1	1	0	0	0	0	0
Valencian Community <sup>a</sup>	1	1	1	1	0	0	0	0	0	0	0
Extremadura	1	1	1	1	0	0	0	0	0	0	0
Galicia	1	1	1	1	0	0	0	1	0	0	0
Community of Madrid	1	1	1	1	0	0	0	0	0	0	0
Region of Murcia	1	1	1	1	0	0	0	0	0	0	0
Navarre	1	1	1	1	0	0	0	0	0	0	0
Basque Country	1	1	1	1	0	0	1	0	0	1	0
La Rioja	1	1	1	1	0	0	0	0	0	0	0

Table 15. Filter matrix ( $\Phi$ ) for the Spanish General Elections in 2008

	PSOE	PP	IU	UPyD	Amaiur	CiU	ERC	PNV	BNG	CC	C
Andalusia	1	1	1	1	0	0	0	0	0	0	0
Aragon	1	1	1	1	0	0	0	0	0	0	0
Asturias	1	1	1	1	0	0	0	0	0	0	0
Balearic Islands	1	1	1	1	0	0	0	0	0	0	0
Canary Islands	1	1	1	1	0	0	0	0	0	0	1
Cantabria	1	1	1	1	0	0	0	0	0	0	0
Castilla-La Mancha	1	1	1	1	0	0	0	0	0	0	0
Castilla and Leon	1	1	1	1	0	0	0	0	0	0	0
Catalonia	1	1	1	1	0	1	1	0	0	0	0
Valencian Community	1	1	1	1	0	0	0	0	0	0	0
Extremadura	1	1	1	1	0	0	0	0	0	0	0
Galicia	1	1	1	1	0	0	0	0	1	0	0
Community of Madrid	1	1	1	1	0	0	0	0	0	0	0
Region of Murcia	1	1	1	1	0	0	0	0	0	0	0
Navarre	1	1	1	1	1	0	0	0	0	0	0
Basque Country	1	1	1	1	1	0	0	1	0	0	0
La Rioja	1	1	1	1	0	0	0	0	0	0	0

Table 16. Filter matrix ( $\Phi$ ) for the Spanish General Elections in 2011

15

<sup>15</sup>La Rioja did not have enough observations for the program to run and had to be dropped from the analysis.

	historical region	$\beta_1$	$\beta_2$	$\beta_2/\beta_1$
Andalusia	55	0.97	0.67	0.69
		[0.72, 1.21]	[0.52, 0.83]	
Aragon	55	0.97	1.59	<b>1.64</b>
		[0.47, 1.50]	[1.13, 2.10]	
Asturias	55	1.30	0.92	0.71
		[0.65, 2.03]	[0.47, 1.38]	
Balearic Islands	55	0.77	0.89	<b>1.16</b>
		[0.41, 1.21]	[0.41, 1.50]	
Canary Islands	55	0.47	0.89	<b>1.89</b>
		[0.07, 0.90]	[0.69, 1.27]	
Cantabria	55	0.40	1.47	<b>3.68</b>
		[-0.03,1.15]	[0.68, 2.37]	
Castilla-La Mancha	55	0.94	0.78	0.83
		[0.65, 1.40]	[0.48, 1.12]	
Castile and Leon	55	1.18	1.37	<b>1.16</b>
		[0.75, 1.62]	[1.04, 1.74]	
Catalonia	51	0.57	1.09	<b>1.91</b>
		[0.47, 0.67]	[0.81, 1.38]	
Valencian Community	55	0.50	0.96	<b>1.92</b>
		[0.30, 0.69]	[0.76, 1.16]	
Extremadura	55	0.41	1.02	<b>2.49</b>
		[-0.35, 1.05]	[0.61, 1.52]	
Galicia	51	0.99	1.45	<b>1.46</b>
		[0.70, 1.32]	[1.12, 1.84]	
Community of Madrid	55	57 0.84	1.05	<b>1.25</b>
		[0.70, 1.32]	[0.76, 1.38]	
Region of Murcia	55	0.82	0.76	0.93
		[0.56, 1.24]	[0.43, 1.10]	
Navarre	55	0.56	0.64	<b>1.14</b>

Table 17. General Parliamentary elections in 2008: Spatial ideological coefficients ( $\beta_1$  - the central periphery dimension,  $\beta_2$  - socio-economic dimension)

	historical region	$\beta_1$	$\beta_2$	$\beta_2/\beta_1$	change 2011-2008
Andalusia	55	0.98 [0.74, 1.22]	0.68 [0.52, 0.84]	0.69	0.00
Aragon	55	0.89 [0.39, 1.43]	1.56 [1.07, 2.06]	<b>1.75</b>	0.11
Asturias	55	1.28 [0.55, 2.05]	0.95 [0.42, 1.49]	0.74	0.03
Balearic Islands	55	0.77 [0.37, 1.20]	0.88 [0.42, 1.40]	<b>1.14</b>	-0.01
Canary Islands	55	0.48 [0.10, 0.90]	0.96 [0.67, 1.28]	<b>2.00</b>	0.11
Cantabria	55	0.39 [0.37, 1.17]	1.45 [0.76, 2.20]	<b>3.72</b>	0.04
Castilla-La Mancha	55	0.94 [0.45, 1.46]	0.8 [0.48, 1.17]	0.85	0.02
Castile and Leon	55	1.23 [0.80, 1.68]	1.37 [1.06, 1.69]	<b>1.11</b>	-0.05
Catalonia	51	0.58 [0.48, 0.69]	1.06 [0.78, 1.36]	<b>1.83</b>	-0.08
Valencian Community	55	0.46 [0.29, 0.64]	0.96 [0.73, 1.21]	<b>2.09</b>	0.17
Extremadura	55	0.4 [-0.24, 1.03]	1.03 [0.61, 1.51]	<b>2.58</b>	0.09
Galicia	51	1.01 [0.70, 1.32]	1.45 [1.11, 1.81]	<b>1.44</b>	-0.03
Community of Madrid	55	59 0.86 [0.58, 1.15]	1.07 [0.78, 1.38]	<b>1.24</b>	-0.01
Region of Murcia	55	0.82 [0.32, 1.42]	0.75 [0.43, 1.08]	0.91	-0.01
Navarre	55	0.62	0.7	<b>1.13</b>	-0.01

Table 18. General Parliamentary elections in 2011: Spatial ideological coefficients ( $\beta_1$  - the central periphery dimension,  $\beta_2$  - socio-economic dimension)

	Spain	Catalonia	Basque County	Galicia	Community of Madrid
	$\mu_j$	$\mu_{j,Catalonia}$	$\mu_{j,Basque}$	$\mu_{j,Galicia}$	$\mu_{j,Madrid}$
PSOE	0.00 [0.00,0.00]	0.14 [-0.56, 0.83]	<b>0.14</b> [ <b>0.57, 0.85</b> ]	0.36 [-0.36, 1.12]	-0.55 [-1.31, 0.14]
PP	-0.42 [-0.90, 0.7]	<b>-0.99</b> [ <b>-1.71, -0.26</b> ]	-0.48 [-1.26, 0.30]	0.58 [-0.10,1,31]	-0.14 [-0.87, 0.54]
IU	<b>-2.42</b> [ <b>-3.00, -1.92</b> ]	0.33 [-0.38, 1.06]	0.52 [-0.26,1.34]	-0.09 [0.92, 0.77]	-0.17 [-0.99, 0.61]
UPyD	<b>-3.74</b> [ <b>-4.35, -3.18</b> ]	-0.33 [-1.29, 0.59]	-0.16 [-1.30, 0.89]	-0.23 [1.25, 0.78]	<b>0.96</b> [ <b>0.14, 1.80</b> ]
CiU	<b>-2.41</b> [ <b>-3.50, -1.22</b> ]	0.00 [0.00,0.00]			
ERC	<b>-3.04</b> [ <b>-4.38, -1.91</b> ]	0.56 [-0.51, 1.72]			
PNV	-0.42 [-1.88, 1.044]		0.00 [0.00,0.00]		
BNG	-0.99 [-2.51, 0.55]			0.00 [0.00,0.00]	

Table 19. General Parliamentary elections in 2008: Exogenous party valence (N = 4346)

	Spain		Catalonia	Basque County	Galicia	Community
	$\mu_j$	$\Delta\mu_j$	$\mu_{j,Catalonia}$	$\mu_{j,Basque}$	$\mu_{j,Galicia}$	$\mu_{j,M}$
PSOE	0.00	0.00	0.27	0.36	0.16	-0.00
	[0.00,0.00]		[-0.30, 0.91]	[-0.31, 1.02]	[-0.49, 0.83]	[-1.08, 0.00]
PP	<b>0.59</b>	1.02	-0.46	-0.32	<b>0.43</b>	-0.00
	<b>[0.14, 1.03]</b>		[-1.08,0.20]	[-1.03, 0.37]	<b>[0.18, 1.06]</b>	[-0.77, 0.00]
IU	<b>-1.23</b>	<u>1.19</u>	0.99	0.01	-0.41	-0.00
	<b>[-1.71, -0.82,]</b>		[-0.16, 1.14]	[-0.67, 0.81]	[-1.11, 0.32]	[-1.11, 0.00]
UPyD	<b>-1.81</b>	<u>1.93</u>	<b>-0.33</b>	0.00	<b>-0.87</b>	<b>0.00</b>
	<b>[-2.3, -1.30]</b>		<b>[-1.86, -0.18]</b>	[-0.92, 0.75]	<b>[-1.79, -0.04]</b>	<b>[0.14, 0.00]</b>
CiU	<b>-1.57</b>	0.84				
	<b>[-2.68, -0.56]</b>					
Amaiur	-0.34	-		0.27		
	[-1.38, 0.74]			[-0.71, 1.24]		
ERC	<b>-1.90</b>	<u>2.07</u>	<b>-1.41</b>			
	<b>[-3.09, -0.79]</b>		<b>[-2.53, -0.48]</b>			
PNV	0.00	0.48				
	[-1.23, 1.35]					
BNG	-1.90	-0.93				
	[3.00, -0.85]					

Table 20. General Parliamentary elections in 2011: Exogenous party

valence (N = 4530)

## Code : rjags

16

```
data2008 <-  
structure ( list (  
  sec=c ( . . . ) ,  
  lr=c ( . . . ) , vote=c ( . . . ) ,  
  region=c ( . . . ) , N = 4551, P = 13,  
  R = 17, psec = c ( . . . ) ,  
  plr = c ( . . . ) ,  
  phi=c ( . . . ) ) ,  
.Names = c ( " sec" , " lr " , "vote " , "region " ,  
  "N" , "P" , "R" , "psec" , " plr " , "phi " ) )  
model  
{  
  for ( i in 1:N)  
  {  
    for (p in 1:P)  
    {  
      v[ i , p] <- lambda[p]  
      - beta[1 , region [ i ] ] * ( sec [ i ] - psec[p])^2  
      - beta[2 , region [ i ] ] * ( lr [ i ] - plr [p])^2  
      + mu[ region [ i ] , p]
```

---

<sup>16</sup>Without restricting the generality, the *rjags* code is given for 2008.

```

expv[ i , p] <- exp(v[ i , p] ) * phi [ region [ i ] , p]
pv[ i , p] <- expv[ i , p]/sum(expv[ i , 1:P] )
}
vote [ i ] ~ dcat (pv[ i , 1:P] )
}
lambda[1] <- 0.00000E+00

```

17Without restricting the generality, the rjags code is given for 2008.

53

```

for (p in 2:P)
{
lambda[p] ~ dnorm(0.00000E+00, taul )
}
for ( r in 1:R)
for ( i in 1:2) {
beta [ i , r ] ~ dnorm(0.00000E+00, tbeta )
}
}
for ( r in 1:R)
{
for (p in 1:P)
{
mu[ r , p] ~ dnorm(0.00000E+00, taum)
}
}
}

```

```
}  
taum ~ dgamma(0.1 , 0.1)  
taul ~ dgamma(0.1 , 0.1)  
tbeta ~ dgamma(0.1 , 0.1)  
}
```