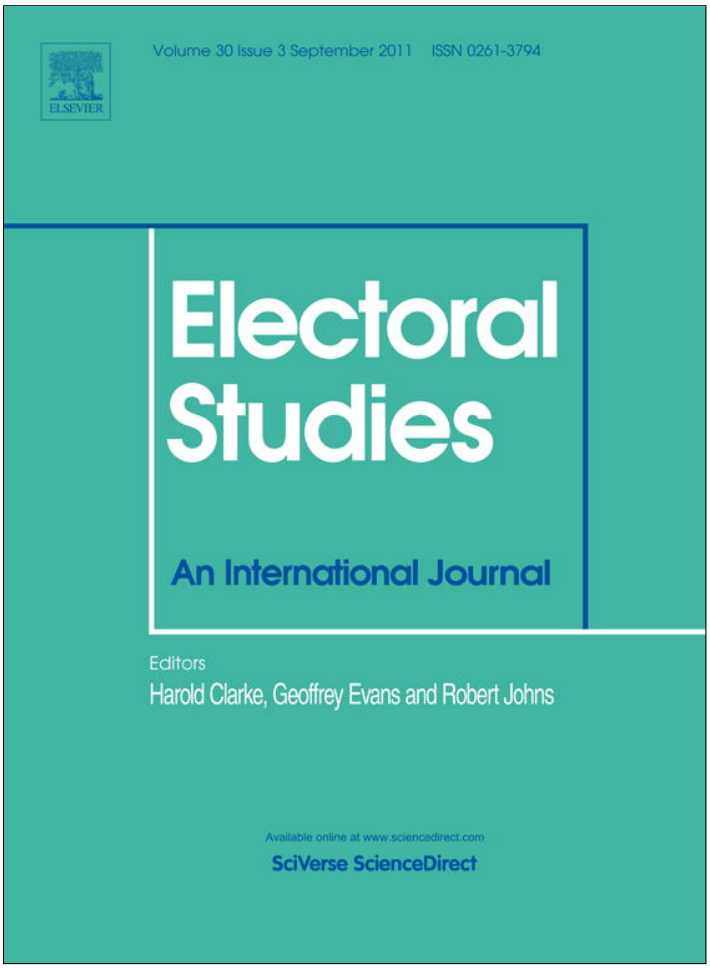

Electoral Studies 30 (2011) 484–496

Contents lists available at ScienceDirect

Electoral Studies

journal homepage: www.elsevier.com/locate/electstud

Leaders, voters and activists in the elections in Great Britain 2005 and 2010

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ARTICLE INFO

Article history:
Received 29 August 2010
Received in revised form 24 February 2011
Accepted 2 March 2011

Keywords:
Stochastic electoral model
Valence
Electoral perceptions of leader traits
Local Nash equilibrium

ABSTRACT

Discussion of the relationship between parties and the electorate is often based on the notion of partisan constituencies, that parties adopt policy positions that correspond to the average position of the party supporters. In contrast, the Downsian "spatial model" assumes that parties are purely opportunistic and maneuver to gain as many votes as possible. A third, more empirical model, based on the early work of Stokes, assumes that voter choice is based on the evaluation of each of the party leader's competence or ability to deliver policy success. Such an evaluation can be provided by individual voter overall assessment in terms of the leaders' character traits.

This paper attempts to relate these three classes of models by examining the elections in Great Britain in 2005 and 2010. Using the British Election Study, we construct spatial models of these elections in Great Britain as well as in the three regions of England, Scotland and Wales. The models incorporate the electoral perceptions of character traits. We compare the equilibrium vote maximizing positions with the *partisan positions*, estimated by taking the mean of each of the parties voters' preferred positions. We define an equilibrium to be a *stable attractor* if the vote share at the equilibrium exceeds the share at the partisan position by a significant proportion (determined by the implicit error of the stochastic model). We infer that none of the equilibria are stable attractors, and suggest that the partisan positions are also preferred by the party activists, the key supporters of each party.

1. Introduction

In recent years there has been much discussion, at both the theoretical and empirical level, about the fundamental electoral incentives of political leaders in democratic societies. One model that is employed has been based on *partisan constituencies*. The idea here is that party leaders can fairly easily, through party membership, polls and data bases, obtain information about the policy positions of their supporters, and each can respond by advocating policies that are close to the mean of the preferences of their respective supporters (See Bernhardt et al. (2009a)). Such a feature would satisfy the ideological congruence between citizens and policy makers (Huber and Powell, 1994; Ezrow, 2010). The term "responsible parties" (Adams, 2001) has been used to characterize the divergent policy choices that are likely in such a system of political competition. It has also been shown by Bernhardt et al. (2009b), in a variant of such a model, that the choice between different policy options, induced by responsible parties, can, under some circumstances, enhance electoral welfare.

On the other hand, the standard Downsian (1957) model of political competition is that of "opportunistic", office seeking parties. Each voter is assumed to choose the party whose policy position is closest while parties are assumed to maneuver so as to gain as many votes as possible.

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doi:10.1016/j.electstud.2011.03.001

Roemer (2001, 2011) has offered a hybrid model of political competition where each party comprises a number of groups with different agendas: "Downsian" opportunists who simply want to maximize their parties vote share and "guardians" who champion the interests of the party's core constituency.[1] Within the context of the spatial model, there has been controversy over whether parties will converge to an electoral center, or whether elections will be chaotic, as suggested by Riker (1980). In this paper we propose to examine these two conflicting theories.

We shall follow the lead of Stokes (1963, 1992) who emphasized, many years ago, that the non-policy judgments, or *valences*, of party leaders by the electorate are just as important as electoral policy preferences. As Sanders et al. (in press) comment, valence theory is based on the assumption that "voters maximize their utilities by choosing the party that is best able to deliver policy success". The authors go on to note that an overall assessment of a party leader by a voter "provides a simple affective heuristic for arriving at an evaluation of that leader's party". There is now a substantial literature that shows that valence models contribute significantly to an understanding of voter choice (see also Scotto et al., 2010). Earlier work based on electoral perceptions of leaders' *character traits* has formed the basis for recent extensive analysis of British, Canadian and US electoral response by Clarke et al. (2009a) and Clarke et al. (2005, 2009b). For Britain, they argue that electoral responses

> were a reflection largely of [the] changing perceptions of the decision-making competence of the main political parties and their leaders. At any point in time, [the] preferences were strongly influenced by their perceptions of the capacity of the rival parties–the putative alternative governments of the day–to solve the major policy problems facing the country.

These works have shown that valence, as measured by the perceptions of the character traits of the candidates, or of party leaders, is a key element of the election. Clarke et al. (2009a: 159) also compared a "Downsian" or pure spatial stochastic model of the 2000 and 2004 US presidential elections with a traits model of the same elections and found that "the two models have approximately equal explanatory power". While the traits model has the virtue of statistical significance, and can be used to estimate the changing electoral perceptions in the lead-up to an election, it gives only one half of the relationship between voters and parties. The trait characteristics are presumed to be based, to some extent at least, on integrating the quality of policy decisions in the past, or by estimating the likelihood of good decisions in the future (Penn, 2009). Suppose these estimates are independent of current declared policies. If the spatial element is statistically relevant, then, as in the Downsian model, the party could make a policy move so as to increase its vote, perhaps by attracting voters who do not have a strong opinion about the qualities of the party leaders.

It is possible, of course, that party leaders have strong policy preferences, as proposed in various models (Calvert, 1985; Duggan and Fey, 2005; Duggan, 2006) or are bound by constituency congruence. However, for an electoral system based on plurality rule, or "first past the post", it is difficult to rationalize the refusal to seek out votes wherever possible. The logic of vote (or seat) maximization would seem to be particularly important when the number of undecided voters, in the period prior to the election, is high. In the case of the 2010 election, the pre-election polls showed that the Conservatives and Labour parties were neck and neck and that there was a great possibility of a hung parliament. Indeed, this inference turned out to be true on election day.

One way to determine the importance of the vote motive is to construct a formal or empirical model that combines elements of valence and policy distance. A number of such formal models have been offered in recent years (Ansolabehere and Snyder, 2000; Groseclose, 2001; Aragones and Palfrey, 2002). More recent work has developed mixed logit statistical models that incorporate some measure of valence. Such models can be used to examine whether, in equilibrium, parties will converge to the electoral center, or diverge in some fashion (Adams and Merrill, 1999, 2001, 2002; Adams et al., 2005).

In this paper, we examine the robustness of the partisan constituency model in the last two general elections in Great Britain. We use the British Election Studies (BES) to construct, for each election, a policy space, X. [2] Using the loadings of the factor analysis, as shown in Table 4, for 2005, and in Table 8 for 2010, in Appendix 2, we can infer a preferred policy point, x_i, in the two dimensional space, for each voter. Consistent with the partisan constituency model, we assume each party, j, anticipates the positions of it supporters and locates at the mean position, z_j^*, of its voters. We then define the *partisan constituency* vector, $\mathbf{z}^*$, to be the vector of such party constituency positions.[3] For example, Fig. 1 shows a smoothing of the voter distributions in the regions of England, Scotland and Wales, with the partisan locations of the three major parties and two regional parties.[4]

Knowing vote intentions we constructed various logit models of the elections, based on these data. Simulation of the models then allows us to relate any vector of party positions, $\mathbf{z}$, to a vector of vote share functions $\mathbf{V}(\mathbf{z}) = (V_1(\mathbf{z}), \ldots V_p(\mathbf{z}))$, predicted by the particular model with p parties. Each party, j, is then characterized by a measure of *exogenous valence*, λ_j, namely the intercept term associated with party j in the model. This model can be considered to be Downsian, since it is based on a pure spatial model.

In addition to exogenous valence, we also incorporated *sociodemographic valences*. Whereas exogenous valence

[1] Roemer focuses on tax policy and only considers a two party model, but does show the existence of an equilibrium.

[2] Appendix 2 gives the survey questions. All tables are given in this Appendix.

[3] Parties also conduct detailed private polls, and they can use this information to find their party constituency positions in the policy space.

[4] Below we give details on the construction of this figure. In the figures we use LAB for Labour, LIB for the Liberal Democrat Party, CON for the Conservative Party, SNP for the Scottish National Party and PC for Plaid Cymru.

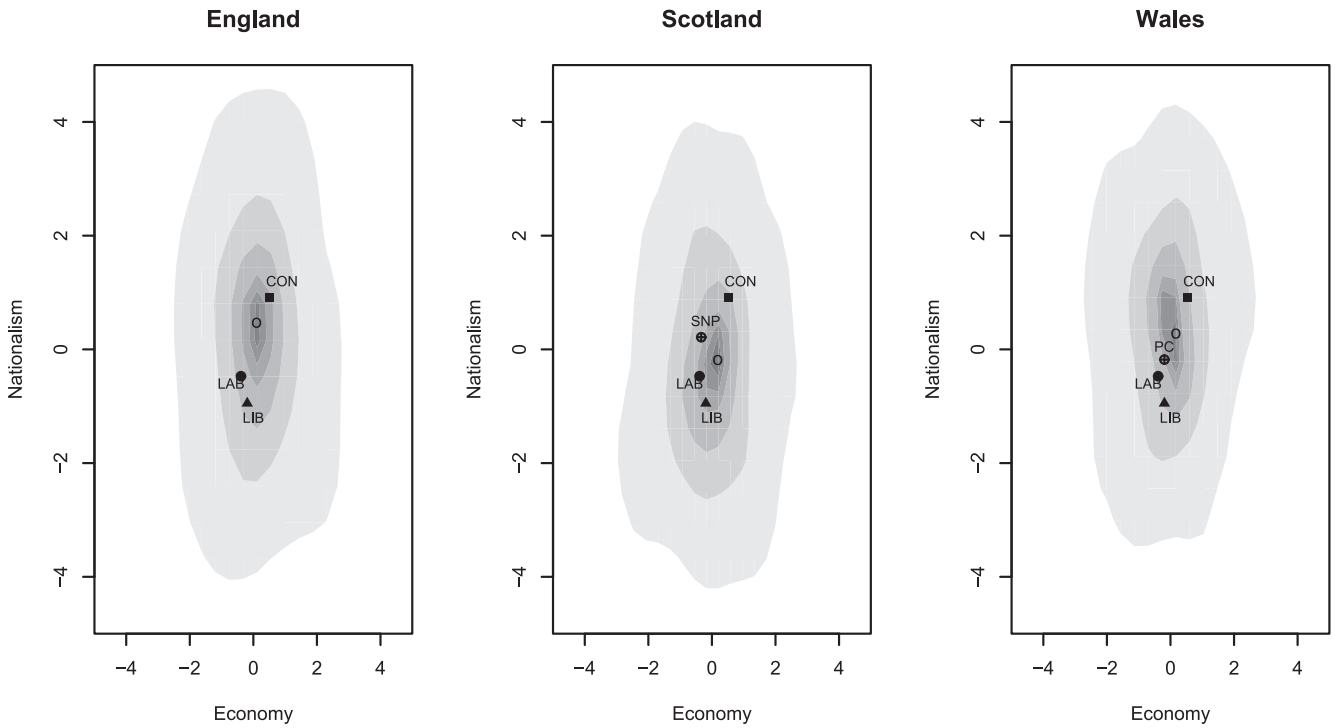

Fig. 1. Voter distributions and party partisan postions in the regions in 2005.

measures a common bias across all voters, sociodemographic valences, based on age, education, gender and income, allow these perceptions of the party leaders to vary across relevant sociodemographic categories. We then extended the model by using the survey evaluations of party leaders to construct a trait index based on factor analysis of the responses. The trait index gives a much more better estimate of voters' evaluation of leader characteristics, or what we call valence, as it involves not only the "attractiveness" of the party leaders, but also "competence", "trustworthyness" "responsiveness," and whether the leader was "knowledgeable." (See Table 6 in Appendix 2 for the factor loadings for traits in 2005). The advantage of using the trait index is that we have an individual estimation of the voter's evaluation rather than an average evaluation by all voters.

We repeated the analysis using the electoral perceptions of the traits of the party leaders, in all three regions of Great Britain.[5] As in previous work, we found that the models involving traits are superior to the pure spatial models. However, as Tables 7 and 10 in Appendix 2 show, for both 2005 and 2010, the joint spatial models with traits give superior loglikelihoods than the pure traits models. We can therefore use variants of the spatial models to estimate whether parties can gain votes by moving from the partisan constituency positions.

To do this we use the notion of a "Nash equilibrium" or the more general notion of a "local Nash equilibrium" (LNE) under vote maximization. A LNE is simply a vector of party positions with the property that no party may make a *small* unilateral move so as to increase utility (or vote share). We use $\mathbf{z}^{el}$ to denote the LNE of the various models. However, an equilibrium need not be a *stable attractor*. We argue that an equilibrium in a spatial model has to present some obvious advantage to at least some of the party leaders. Assuming that parties are initially located at the *partisan constituency* vector, $\mathbf{z}^*$, say, then we can use the stochastic model to compare the estimate of the vote shares, $\mathbf{V}(\mathbf{z}^*)$, with the vote shares, $\mathbf{V}(\mathbf{z}^{el})$, at the LNE, $\mathbf{z}^{el}$. We can determine $\mathbf{V}(\mathbf{z}^{el})$ by simulation. The structure of the formal model makes it convenient to use the criterion that the lowest valence leader, say $j = 1$, will be "advantaged" at $\mathbf{z}^{el}$. Since the electoral model involves stochastic risk we assume the low valence parties are somewhat risk averse, and we compute the lower expected vote share (at the 95% level) for a low valence party 1, say and let $V_1(\mathbf{z}^{el})$ denote this share. We let $V_1(\mathbf{z}^*)$ be this party's vote share at the partisan constituency vector, $\mathbf{z}^*$.[6] We then define the *vote margin* for such a low valence party to be $\delta = V_1(\mathbf{z}^{el}) - V_1(\mathbf{z}^*)$ and say that $\mathbf{z}^{el}$ is a *stable attractor* whenever $\delta > 0$. In this case the opportunists in the party can argue that it would be worthwhile changing position to gain votes. Then we can assume that the low valence party would move away from z^* in order to increase its vote share, and then other parties would be induced to match this movement to maintain their votes, and the eventual outcome would be $\mathbf{z}^{el}$.

[5] We did this because the perceptions of the leaders' traits varied significantly across the regions and because the SNP and Plaid Cymru ran candidates respectively only in Scotland and in Wales.

[6] This can be estimated using the sample vote share of the party for the election under consideration.

If the equilibrium fails to be a stable attractor then we assume the party stays at its partisan constituency position.

We first examine the pure spatial model and determine whether the equilibrium, $\mathbf{z}^{el}$, is given by the joint electoral mean, $\mathbf{z}_0$, where each party is located at the *electoral mean*, z_0, as suggested by the *mean voter theorem* (Schofield, 2007). A key parameter of all spatial models is the *spatial coefficient*, β. This coefficient provides an estimate of the importance of policy distance in the voter utility function.[7]

For each pure spatial model we compute a *convergence coefficient*, denoted c, that depends on various parameters, namely the exogenous valences $\{\lambda_j\}$, the spatial parameter, β, and the electoral variance.[8] Previous work (Schofield, 2007) has shown that if $c < 1$, then the LNE is one where all parties adopt the same position at z_0.[9] On the other hand, if $c \geq w$, where w is the dimension of the space, then the LNE is one where all parties diverge away from the electoral mean. For 2005, we found for Britain that $c = 0.84$, while in 2010 we found $c = 0.98$.[10] We repeated the analysis for the regions, England, Scotland and Wales and found somewhat similar results. To locate the LNE for the regional models with and without sociodemographic valence, we deployed the simulation program. Not all equilibria were determined to be at the electoral mean, but were found to be very close. [11] Moreover, by our definition, none of these equilibria were stable attractors. We argue that none of the low valence parties would have a strong motivation to shift to the electoral mean. We infer that any centripetal tendency toward the electoral center would be quite weak.

We repeated the equilibrium exercise using the traits models, and found equilibrium positions and vote shares in 2005 to be slight perturbations of the pure spatial models. In 2010, however, we found that the trait indices for Gordon Brown, the Labour leader, were much lower than the other two party leaders, Clegg and Cameron. Obviously enough, this was the reason why Labour did so badly in the election. Our equilibrium analysis suggests that the equilibrium vote maximizing position for Brown under the traits model was not far from the Labour Party partisan constituency position. However, we estimate that the Labour party vote share would be *lower* at this equilibrium than at $\mathbf{z}^*$. By our definition, such an equilibrium was not even an attractor from the point of view of the Labour Party. Even though the Labour Party would have little incentive to shift position, the analysis does suggest that both the Conservative Party and Liberal Democrat Party could, in principle, have moved somewhat closer to the center to take further advantage of Brown's weakness, as perceived by the electorate. We suggest that they did not do so because of the influence of party activists.

While much recent research has modeled the trait characteristics of political leaders in a number of countries, we believe this is the first examination of the optimal response of leaders to these electoral perceptions. Since these perceptions are distributed in the electorate, a rational leader should adjust policies to take advantage of this distribution, if possible.

However, electoral success also depends on the resources made available by party activists.[12] The preferred positions of activists can be assumed to influence the location of the parties.[13] In our analysis we use various methods to estimate the positions of activists, and find these positions to be very similar to those of party partisans. This provides additional support for inferring that parties adopt positions at, or very close to, the partisan constituency positions. While equilibrium analysis has suggested that parties will tend to the electoral mean, we contend that these models do not provide an accurate picture of party positioning.

2. The 2005 election

In the June 2001 election in the United Kingdom, the Labour Party, under Tony Blair repeated its election victories of 1997 by taking 413 (out of 646) seats against the Conservative Party, led by William Hague, and the Liberal Democrats, led by Charles Kennedy.[14] Hague resigned after the election, and Iain Duncan Smith became leader of the Opposition. In need of more popular leadership, Michael Howard became leader of the Conservative Party in November, 2003. In the election of May, 2005, Blair again repeated his success by leading the party to victory with 356 seats. It was generally assumed that the Labour Party lost 57 seats, while the Conservatives gained 32, because of the British involvement in Iraq. Howard stepped down as opposition leader in December 2005 and David Cameron became leader of the Conservative Party. The election results for Great Britain as a whole, as well as separate tables for England, Scotland, Wales in 2005 are given in (Tables 1 and 2 in Appendix 2) The working paper version of this paper (Schofield et al., 2011) contains further information on the elections of 2005 and 2010, as well as details of the factor analysis used in our models.

We constructed a pure spatial model of the election based on a factor analysis of the survey from the British Election Study (BES). (See Appendix 2, Tables 4 and 7, model 1.) We argue that this model suggests that Labour won the election because of the significant valence difference between Blair and Howard. We also ran separate models for England, Scotland and Wales, incorporating the

[7] As usual we use a quadratic loss function, for voter utility, weighted by the coefficient, β. In all the empirical models, β has a highly significant t-value.

[8] By its construction, c is dimensionless, and is independent of the units of measurement of the various parameters.

[9] The Appendix presents some definitions and computations. Details can be found in the working paper (Schofield et al., 2011). Further details on the empirical work can also be found in this paper.

[10] The upper 95% bounds on these coefficients were estimated to be 1.08 and 1.10 respectively. Nonetheless the Hessians of the low valence parties at $\mathbf{z}_0$ were estimated to have negative eigenvalues, with probability greater than 95%.

[11] We did the regional analyses to determine if there were significant differences in the models, but these differences had negligible impact on the nature of the equilibria. Details are available in the working paper version, Schofield et al. (2011).

[12] Roemer (2011) uses the term "militants" for those who are concerned to defend the principles of the party.

[13] Schofield (2006) presents a formal equilibrium model of the influence of activists on party positioning. See also Aldrich (1983).

[14] See Clarke et al. (1997, 1998) and Schofield (2005) for earlier elections.

regional parties, the SNP in Scotland and Plaid Cymru in Wales. These models show that the valence differences between Blair and Howard were particularly pronounced in Scotland and Wales (See Schofield et al. (2011)).

Two factors explained about 43% of the variance of the 13 question responses. The first factor was strongly associated with the issue of "EU membership", "Immigrants", "Asylum seekers" and "Terrorism". We called this the *nationalism* dimension. Fig. 1 presented the smoothed electoral distribution obtained from this analysis. We have oriented the *y*-axis in this figure so that a high value means stronger nationalism. The second dimension is *economic*. The items of "tax/spend", "free market", "international monetary transfer", "international companies" and "worry about job loss overseas" have strong influence in this dimension. In the economic dimension, a higher value indicates a pro-market oriented attitude. We designated the *x*-axis as the "economy" and the *y*-axis as "nationalism".

The positions of Labour, the Conservative Party and the Liberal Democrats on the two dimensions were estimated in the two dimensions using the result of the factor analysis and the respondents' voting intentions. On the 0–10 scale, those who reported relatively stronger voting intention (>7) for a party were taken as the party's voter. A party's position is estimated by taking the mean value of its party voters, using these high scores of the respondents who intended to vote for the party. (We considered that this was consistent with the notion of *partisan constituencies*.) Fig. 1, presented above, shows the estimated positions of the parties obtained in this fashion.

We also considered other questions measuring social values such as voters views on minority, gender role, censorship, environment, death penalty, but the loadings were less than 0.20 at most in the first two factors. The analysis was based on the 13 questions, with 1564 respondents from England, Scotland and Wales. Respondents who said they volunteered to get involved in politics were coded as activists. (In 2005, 210 respondents were coded as activists, about 13% of the total sample). We used the high intention (>7) to vote for the party to code these activists as party activists, thus giving a party electoral distribution of activists. The activist means by party are given in Fig. 2. We used the LibDem party as the baseline for the MNL pure spatial models, for Great Britain, with 1149 respondents (those who voted for the Labour, Conservative and Liberal Democratic parties in Great Britain). As Table 7 (model 1) in Appendix 2 shows, the β – coefficient is highly significant.

We also computed the regional models for England, Scotland and Wales based on a sample size of 1564 consisting of those respondents who voted for either the three large parties or the two regional parties (the Scottish National Part, the SNP, and Plaid Cymru, PC). The sample proportions for Labour, Conservatives and Lib Dems in Great Britain were 41.5%, 34.0%, and 24.5%, respectively. These were similar to the actual vote shares (in Great Britain, excluding minor parties and Northern Ireland) of 39.4%, 36.0%, 24.6%, respectively.[15]

[15] We call these vote shares a *three-way split*, since they give the shares just between these three parties.

The estimated partisan positions of the five parties in Great Britain, in 2005, were found to be:

$$\mathbf{z}^*_{2005} = \begin{bmatrix} Party & Lab & Lib & Cons & SNP & PC \\ Econ & -0.39 & -0.19 & 0.52 & -0.12 & -0.31 \\ Nat & -0.47 & -0.95 & 0.91 & -0.11 & 0.04 \end{bmatrix}.$$

as in Fig. 1. The activist means for the three major parties were

$$\mathbf{z}^{act}_{2005} = \begin{bmatrix} Party & Lab & Lib & Cons \\ Econ & -0.40 & -0.22 & 1.00 \\ Nat & -1.61 & -1.51 & 0.86 \end{bmatrix},$$

as shown in Fig. 2. Since activists were those who said they had volunteered to get involved in politics or community affairs, they may be presumed to have a greater impact on the party positions than non activists. Moreover, we had their vote intentions, so we can compare party voters and party activists. These comparisons suggest that Conservative Party activists, on average, were much more right wing on economic issues than Conservative voters, while activists for the Labour Party and Liberal Democratic Party tended to be less nationalistic (that is, much more supportive of the European Union). We had no information on activists for the SNP and PC.

2.1. Pure spatial models for Great Britain for 2005

Appendix 1 contains the technical details of the formal spatial model used here. It defines and computes the convergence coefficient for the 2005 election in Great Britain, obtaining $c = 0.84$. As Table 5 in Appendix 2 shows, the upper 95% bound on this estimate of c was found to be 1.08. We computed the 95% bounds on the Hessian at the joint origin, and confirmed that the eigenvalues were negative so the joint electoral origin could be estimated to be an LNE with high probability. Because the variances were very different on the two axes, we also constructed the spatial model with a separate β – coefficient for each axis and showed again that the joint electoral mean was an LNE. These results were confirmed by simulation. The working paper version (Schofield et al., 2011) gives the results of the same exercise for England, Scotland and Wales, and obtained similar results, with

$$\left(c^{eng}, c^{sct}, c^{wales}\right) = (0.75,\ 0.97,\ 0.80).$$

We also checked that the Hessians were negative definite, using the 95% error bounds on the parameters. Using the regional estimates we performed simulations and estimated the predicted vote shares on the basis of the regional spatial models. These are denoted ρ in Table 5 in Appendix 2. As the Table shows, the lower 95% bounds on ρ, for the lowest valence party in each region, is below that party's sample vote share. These regional equilibria were therefore not stable attractors by our definition, and we argue that these low valence parties have no incentive to move from their partisan constituency positions.

2.1.1. The spatial model with traits for 2005

To extend the model, we used survey questions on the party leader traits to construct a trait index by factor

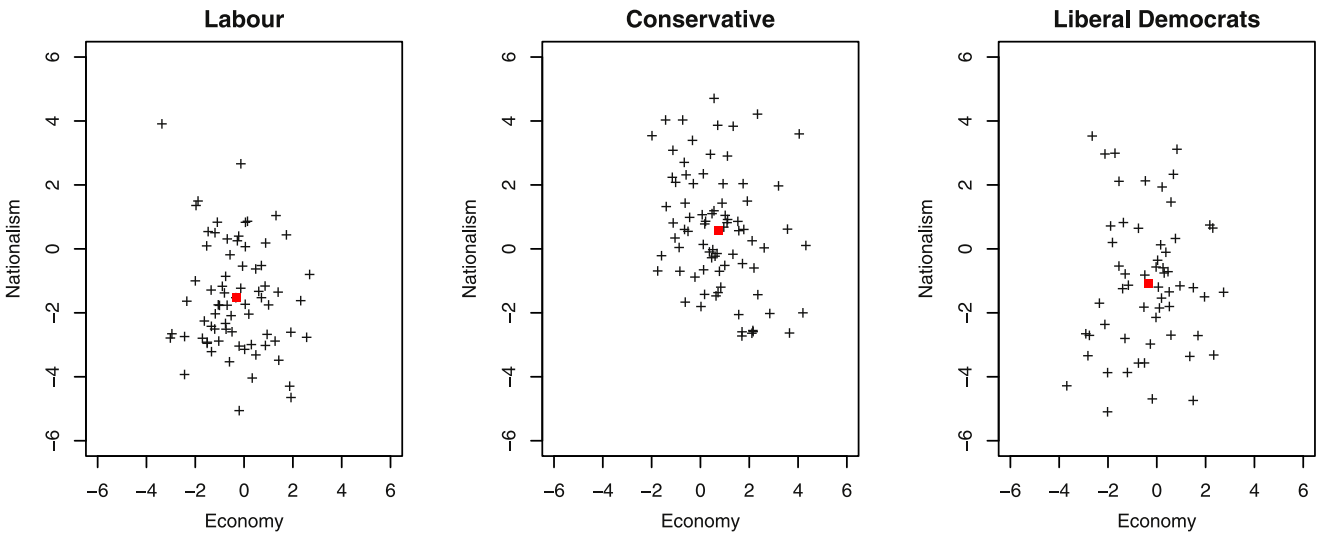

Fig. 2. Activists and activist means (red square) by party in 2005. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

analysis (see Table 6 in Appendix 2). The first question in the survey involved the voter's feelings about the party leaders. The response to this question gives an indication of the attractiveness of the leader. Two questions deal with competence and trust, while a fourth questions asks whether the leader is responsive to voter concerns.

Table 7 (Models 2,3 and 4) also gives the result of the various models with traits alone, the spatial model with traits, with and without sociodemographic variables.

Notice that by Table 7, the β – coefficients are still highly significant in the spatial models just with traits and with both traits and sociodemographics, while the valence term for Blair is not statistically significant in the traits models, with (or without) sociodemographics. Traits capture almost all that we may regard as valence, and so this explains why the intercept term, the exogenous valence, is no longer significant. The advantage of using the traits model is that it allows the voter's perceptions of leaders' traits to be voter specific rather than an average. However, adding the spatial model to the pure traits model does contribute statistical significance. (See the values for the Akaike Information Criteria, AIC, in Table 7).

We redid the traits analysis for the three regions, obtaining measures for the trait indices for the SNP leader, Salmond in Scotland and Llwyd in Wales, and analyzed all trait, spatial and sociodemographic models by region, obtaining very similar results.

For the three party model for Great Britain, we found by simulation that the local equilibrium for the spatial traits model including sociodemographics was:

$$\mathbf{z}^{el}_{sts} = \begin{bmatrix} Party & Lab & Lib & Con \\ Econ & -0.07 & -0.04 & 0.16 \\ Nat & -0.31 & -0.20 & 0.14 \end{bmatrix}$$

with an predicted vote share of

$$(\rho_{\text{Lab}}, \rho_{\text{Lib}}, \rho_{\text{Con}},)_{\text{sts}} = (0.41, 0.25, 0.34)$$

Notice this is very similar to the prediction of the pure spatial model

$$(\rho_{\text{Lab}}, \rho_{\text{Lib}}, \rho_{\text{Con}},)_{\text{s}} = (0.42, 0.25, 0.33).$$

The three way vote share for the low valence Liberal Democrats at the equilibrium, $\mathbf{z}^{el}_{\text{sts}}$, was $\rho_{\text{Lib}} = 0.25$, with an estimated lower bound of 0.22, whereas the three way sample vote share for the party was 0.25, implying that this the equilibrium was not a stable attractor.

Comparing the estimated positions of these three parties with those given by $\mathbf{z}^{*}_{2005}$ and $\mathbf{z}^{\text{act}}_{2005}$ suggests that activists, with more pronounced preferences on the economic axis, influence the Conservative Party, while activists, supportive of the European Union, influence both the Labour Party and Liberal Democratic Party.

3. The election of 2010

Gordon Brown became leader of the Labour Party and Prime Minister on 27 June 2007 after the resignation of Tony Blair, while Nicholas Clegg became leader of the Liberal Democrats on 18 December 2007. Brown's popularity fell dramatically as a result of various scandals involving the Labour Party and the deep financial and economic crises. The outcome of the May 6, 2010 election was a hung Parliament with no majority party. (See Table 3 in Appendix 2.) Gordon Brown formally resigned as Prime Minister on May 11 and David Cameron, the Conservative leader, was able to form the next government, in alliance with the Liberal Democrats, with Clegg as deputy Prime Minister. The Cabinet comprised 18 Conservatives and 5 Liberal Democrats, roughly proportional to the two parties' strengths. The Queen's speech, at the opening of the new Parliament on May 25, laid out the policy plans for the new government, including a reduction of the budget deficit of $220 billion. On 25 September 2010, Ed Miliband was elected leader of the Labour Party.

Fig. 3 shows the estimated party partisan positions in 2010 in the three regions of Great Britain (The positions of the three major parties are estimated by the voter responses to the 2010 BES for the whole of Great Britain, while the estimates for the SNP and PC are based just on

Fig. 3. Voter distributions and estimated partisan party positions in the regions in 2010.

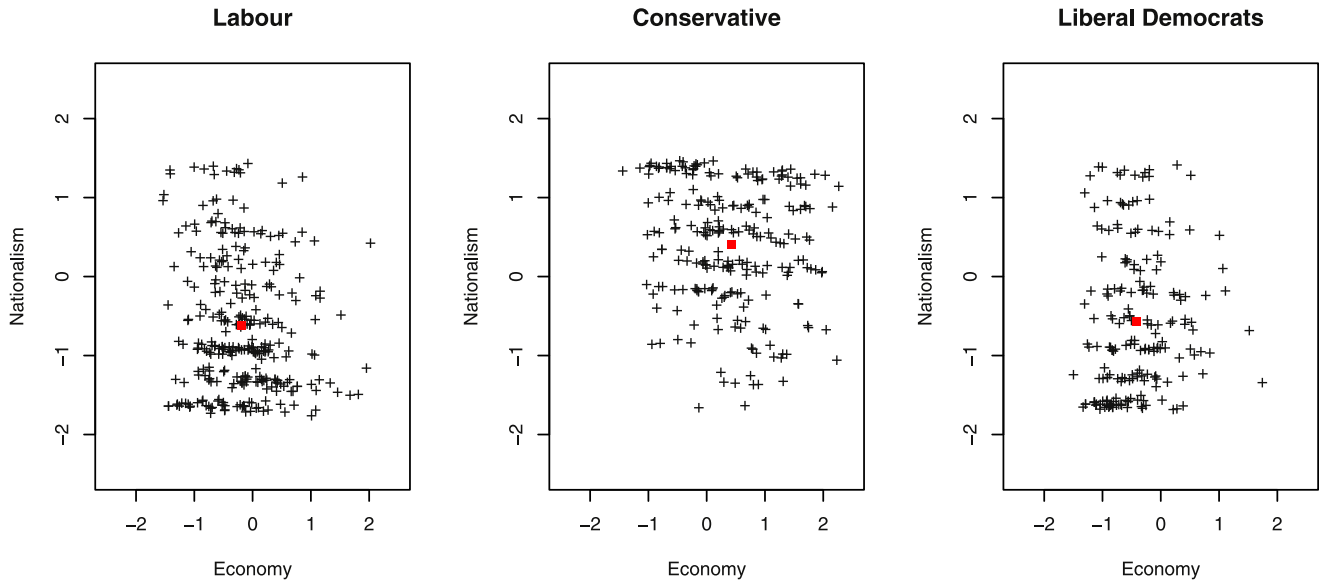

Fig. 4. Activists and activist means (red square) by party in 2010. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

the regional votes.). The policy distance between the Conservative position and the Liberal Democrats suggests that there may well be conflicts in the coalition over government policies.

We proceeded in the same way as for 2005 to construct a factor space based on the 2010 BES (as shown in Table 8 in Appendix 2).[16] The sample ($n = 6409$) included respondents who participated both in pre- and post-election surveys, voted for Lab, Con, Lib, SNP or PC, and were without missing data points in the variables regarding vote choice, issue dimensions, traits and sociodemographic. The sample contained 5466, 636 and 307 respondents from England, Scotland and Wales, respectively. The sample party votes shares were

(Lab, Con, Lib, SNP, PC) = (0.281, 0.400, 0.289, 0.025, 0.005).

As in 2005, one dimension was *Nationalism* and the second one was the *Economy*. A larger value in the *Nationalism* dimension is strongly associated with disapproval to Britain's EU membership and disagreement with Britain's further formal cooperation with through EU institutions. Higher values on the *Economic* dimension, are associated with those who prefer tax-cuts, who disagree

[16] We also included several other policy related items, but the contribution of these items was very low.

with increasing the tax-free allowance to £10,000 or to a mansion tax (essentially a property tax), or to limiting pension tax relief, or to ecotax. In sum, a larger value on the first dimension indicates stronger nationalism and on the second dimension pro-market attitudes. As in the analysis of the 2005 election, we represent the economic dimension as the *x*-axis and the nationalism dimension as the *y*-axis.

Using the factor scores, we estimated the party positions. Again, each party position is estimated as the mean of the voters who intended to vote for the party before the election using the "Vote Intention item in pre-election surveys". The party partisan positions were computed from the factor model to be:

$$\mathbf{z}^*_{2010} = \begin{bmatrix} Party & Lab & Lib & Con & SNP & PC \\ Econ & -0.205 & -0.349 & 0.392 & -0.392 & -0.074 \\ Nat & -0.437 & -0.431 & 0.449 & -0.25 & 0.229 \end{bmatrix}.$$

Using estimates based on actual vote gave almost identical estimates.

In 2010 the question about volunteering to get involved in politics was not available. Instead we used the response to the question "*On a scale of 0 to 10, how much attention do you generally pay to politics?*" Those who answered -"*pay a great deal of attention*" were designated as activists. Their party vote was used to allocate them to different categories. (The number of activists was 821, just over 12% of the sample, similar to the proportion in 2005). The activist party means estimated by actual party vote and by vote intention and were almost identical as shown here:

$$\mathbf{z}^{act}_{2010} = \begin{bmatrix} & Lab & Lib & Con \\ Econ & -0.183 & -0.418 & 0.420 \\ Nat & -0.626 & -0.575 & 0.402 \end{bmatrix}, \begin{bmatrix} & Lab & Lib & Con \\ Econ & -0.19 & -0.45 & 0.38 \\ Nat & -0.67 & -0.76 & 0.45 \end{bmatrix}$$

(Note that the data on vote intentions and actual vote were obtained from the same sample, so the slight differences in the above estimates can be regarded as due to sample error.)

The electoral mean position using all respondents was (0.010, 0.003) while the overall activist mean was (–0.048, –0.277). Fig. 4 shows the activist distributions and means by party.

We also used the trait perceptions of the three major party leaders to perform a factor analysis of the leaders' traits. Table 10 gives the factor loadings for the traits and Table 11 reports the results for the various models: pure spatial, pure traits, spatial with traits and joint (spatial, traits and sociodemographics). Table 11 again makes clear that the traits model is far superior to the pure spatial model. However, the difference in log-likelihoods between the spatial model with traits and the pure traits model is a significant +123. Adding sociodemographics gives a significant +37. The AIC measures also drop significantly, as new variables are added.

Comparing Table 7 (model 1), the pure spatial model for 2005 with Table 10 (model 1), the pure spatial model for 2010, we see immediately that Brown has a low exogenous valence ($\lambda^{2010}_{\text{Lab}} = -0.04$) relative to Clegg in 2010, and this value was much lower than Blair's exogenous valence ($\lambda^{2005}_{\text{Lab}} = +0.052$) relative to Kennedy in 2005. Even when trait perceptions are included, the *positive* valence estimates for Blair are higher for the two nested models with traits, and spatial with traits,[17] than the *significantly negative valence* estimates for Brown in the same models.[18]

3.1. Spatial models for Great Britain in 2010

Appendix 1 shows that the convergence coefficient for the pure spatial model for 2010 is 0.98.[19] Since this is less than 1, then from the Valence Theorem, the sufficient condition for convergence to the electoral mean is satisfied. Simulation of the model confirmed this inference.

We also ran the pure spatial, spatial trait and joint models for the three regions, England, Scotland and Wales, with sample sizes for the regional models of 5465, 636, and 307 respectively. These results are reported in Schofield et al. (2011). Table 9 reports the 95% bounds on the predicted vote shares in the regions (denoted ρ in the table). The lower estimates of ρ for the lowest valence party in each region is below those of the relevant sample shares. By our definition, these LNE are not stable attractors. [20]

Using the results of the various models we determined the equilibria of the traits models for the election in Great Britain to be

$$\mathbf{z}^{el}_{sts} = \begin{bmatrix} Party & Lab & Lib & Con \\ Econ & -0.21 & -0.11 & 0.05 \\ Nat & -0.34 & -0.14 & 0.15 \end{bmatrix}$$

for the spatial traits model with sociodemographics, giving a simulated vote share of

$(\rho_{\text{Lab}}, \rho_{\text{Lib}}, \rho_{\text{Con}},)_{\text{sts}} = (0.30, 0.29, 0.42)$.

Because the various estimates of Brown's trait valence is statistically much lower than that of the other two leaders, we find that the Labour party equilibrium position given by $\mathbf{z}^{el}_{\text{sts}}$is fairly close to its estimated position, as given by $\mathbf{z}^*_{2010}$. The higher valences of Clegg and Cameron give somewhat "centrist" equilibrium positions at $z^{2010}_{\text{con}} = (+0.05, 0.15)$ and $z^{2010}_{\text{lib}} = (-0.11, -0.14)$.Moves by these two parties would change the Labour vote share, ρ_{Lab}, to 0.30, in comparison to the three-way sample share of $s_{\text{Lab}} = 0.33$. We argue that this LNE cannot be a stable attractor.

4. Conclusion

We have based our analysis on the supposition that parties are located at the partisan constituency positions. On this assumption we have shown that the spatial

[17] Table 7 (models 2 and 3) show that ($\lambda^{2005}_{Lab} = +0.19; +0.18$) are both statistically significant but with t-*values* $\simeq 1.7$.

[18] Table 10 (models 2 and 3) show that ($\lambda^{2010}_{Lab} = -0.96; -0.98$) are both statistically significant and negative, with t – *values* > 15.0. The lower 95% bounds on Blair's valences are higher than the upper 95% bounds on Brown's valence.

[19] Although the upper 95% bound on $c = 1.10$ exceeds 1, the Hessian was estimated to have negative eigenvalues, with probability exceeding 95%.

[20] We did find that the electoral men was not an LNE in the election in Wales, but the LNE we did find was also not stable.

component adds statistical significance to the model with traits. We have performed the thought experiment to locate local equilibria to these various spatial models. Because of the stochastic uncertainty of the spatial model, we have argued that the opportunists in a low valence party will be able to persuade the party to shift position to seek out votes only if the resulting equilibrium proves to be a stable attractor.

In 2005, for the three party model for Great Britain, we estimate that the local vote maximizing equilibrium for the spatial traits model is slightly perturbed from the electoral mean. However, by our definition, we judge that this equilibrium was not a stable attractor.

For 2010, the large traits differences between Brown and the other two leaders gave a divergent equilibrium, with Brown's equilibrium position relatively close to his estimated position. However, we estimate that the vote share of the Labour party at this equilibrium, regarded as a three way split, was lower than at the *partisan constituency* position, suggesting that there was no incentive for the Labour Party to change position.

On the other hand, the simulation suggests that opportunists in the Conservative and Liberal Democrat parties could have moved the party positions toward the electoral center in order to taken advantage of Brown's electoral weakness. We suggest that because activists for these two parties tend to have somewhat more extreme positions than the party voters, they were able to influence the party to adopt policies that the activists found more congenial.

Acknowledgment

This paper is based on work supported by NSF grant 0715929 and a Weidenbaum Center grant. Earlier versions were first completed while Gallego was a visitor at the Center and later when Schofield was the Glenn Campbell and Rita Ricardo – Campbell National Fellow at the Hoover Institution, Stanford, 2010. The authors thank the two anonymous referees of the journal for very helpful comments.

Appendix 1. The formal stochastic model

The electoral model presented here is an extension of the multiparty stochastic model of McKelvey and Patty (2006), modified by inducing asymmetries in terms of valence.

Definition 1. The Stochastic Vote Model $\mathbb{M}(\lambda, \theta, \mu, \beta)$ with Activist Valence.

The data of the spatial model is a distribution, $\{x_i \in X\}_{i\in N}$, of voter ideal points for the members of the electorate, N, of size n. We assume that X is a compact convex subset of Euclidean space, $\mathbb{R}^w$, with w finite. The point $\frac{1}{n}\sum x_i$ is termed the *electoral mean*, $z_0 \in X$. $P = \{1, \ldots, j, \ldots, p\}$ is the set of parties. Let $\mathbf{z} = (z_1, \ldots, z_p) \in X^p$ be a vector of party policy positions.

We define a stochastic electoral model, which utilizes sociodemographic variables and voter perceptions of character traits. For this model we assume that voter i utility is given by the expression

$$\mathbf{u}_i(x_i, \mathbf{z}) = (u_{i1}(x_i, z_1), \ldots, u_{ip}(x_i, z_p)) \text{ where}$$

$$\begin{aligned} u_{ij}(x_i, z_j) &= \lambda_j + (\theta_j \cdot \eta_i) + (a_j \cdot \tau_i) - \beta\|x_i - z_j\|^2 + \varepsilon_j \\ &= u^*_{ij}(x_i, z_j) + \varepsilon_j. \end{aligned} \tag{1}$$

Here $u_{ij}^*(x_i, z_j)$ is the observable component of utility. The constant term, λ_j, is the exogenous *valence* of party j, and the exogenous valence vector $\lambda = (\lambda_1, \lambda_2, \ldots, \lambda_p)$ is assumed to satisfy $\lambda_p \geq \lambda_{p-1} \geq \ldots \geq \lambda_2 \geq \lambda_1$. The term $\|x_i - z_j\|$ is simply the Euclidean distance between x_i and z_j. The error vector $\varepsilon = (\varepsilon_1, \ldots, \varepsilon_j, .., \varepsilon_p)$ is distributed by the type I extreme value distribution, as assumed in empirical MNL estimation (Train, 2003). All errors are iid and need not be suffixed by j. The variance of ε_j is fixed at $\frac{\pi^2}{6}$, so that by definition β has dimension $\frac{1}{L^2}$, where L is whatever unit of measurement is used in X.

Sociodemographic aspects of voting are modeled by θ, a set of k-vectors $\{\theta_j : j \in P\}$ representing the effect of the k different sociodemographic parameters (age, gender, education, income, *etc.*) on voting for party j while η_i is a k-vector denoting the ith individual's relevant "sociodemographic" characteristics. The compositions $\{(\theta_j \cdot \eta_i)\}$ are scalar products, called the *sociodemographic valences* for j. The terms $\{(\alpha_j \cdot \tau_i)\}$ are scalars giving voter i's perceptions about the character *traits* of party j. A *trait score* can be obtained by factor analysis from a set of survey questions asking respondents about the traits of the party, including 'competent', 'responsive', 'trustworthy', 'knowledgeable', etc.

The partial models include a pure spatial model, $\mathbb{M}(\lambda, \beta)$, a pure sociodemographic model, $\mathbb{M}(\lambda, \theta)$, a pure trait model, $\mathbb{M}(\lambda, \alpha, \beta)$, and *joint* models, with or without traits, $\mathbb{M}(\lambda, \theta, \alpha, \beta)$ and $\mathbb{M}(\lambda, \theta, \beta)$.

In all models, voter behavior is modeled by a probability vector. The probability that a voter i chooses party j at the vector $\mathbf{z}$ is

$$\rho_{ij}(z) = \Pr\left[\varepsilon_l - \varepsilon_j < u^*_{ij}(x_i, z_j) - u^*_{il}(x_i, z_j) \textit{for all } l \neq j\right]. \tag{2}$$

Here Pr stands for the probability operator generated by the distribution assumption on ϵ.

The expected vote share of party j is

$$V_j(\mathbf{z}) = \frac{1}{n}\sum_{i\in N} \rho_{ij}(\mathbf{z}). \tag{3}$$

In this stochastic electoral model it is assumed that each party j chooses z_j to maximize V_j, conditional on $\mathbf{z}_{-j} = (z_1, .., z_{j-1}, z_{j+1}, .., z_p)$. A *local Nash equilibrium* (LNE) is a vector $\mathbf{z}$ such that all $V_j(\mathbf{z})$ satisfy the first and second order conditions for strict local maxima. The *joint mean* is the vector $z_0 = (z_0, \ldots, z_0) \in X^p$. Let σ^2 be the total electoral variance, the trace of the electoral covariance matrix, ∇_0, about the electoral mean. Let $\rho_1(z_0)$ be the probability that a generic voter chooses the lowest valence party, 1, at the vector z_0. Then

$$\rho_1(\mathbf{z}_0) = \left[1 + \sum_{k=2}^{p} \exp[\lambda_k - \lambda_1]\right]^{-1}. \tag{4}$$

Definition. The Convergence Coefficient of the Model $\mathbb{M}(\lambda, \beta)$ is $c \equiv c(\lambda, \beta) = 2\beta[1 - 2\rho_1(z_0)]\sigma^2$.

Valence Theorem (See Schofield, 2007 for the formal proof).

(i) The joint mean z_0 satisfies the first order condition to be a LNE for the model $\mathbb{M}(\lambda, \beta)$.

(ii) The *necessary and sufficient* condition for $\mathbf{z}_0$ to be an LNE is that the matrix $2\beta[1 - 2\rho_1(z_0)]\nabla_0$ has negative eigenvalues.

(iii) A *sufficient* condition for z_0 to be a LNE of the model $\mathbb{M}(\lambda, \beta)$ is that $c(\lambda, \beta) < 1$.

(iv) A *necessary* condition for z_0 to be a LNE for the model $\mathbb{M}(\lambda, \beta)$ is that $c(\lambda, \beta) < w$.

The pure spatial model for 2005 in Table 7 gives

$$\nabla_0 = \begin{bmatrix} 1.646 & 0.00 \\ 0.067 & 3.961 \end{bmatrix}.$$
$$(\lambda_{Lab}, \lambda_{Con}, \lambda_{Lib}, \beta) = (0.52, 0.27, 0, 0.15).$$
$$(\rho_{Lab}(\mathbf{z}_0), \rho_{Con}(\mathbf{z}_0), \rho_{Lib}(\mathbf{z}_0)) = (0.42, 0.33, 0.25).$$
$$c(\boldsymbol{\lambda}, \beta) = 2\beta(1 - 2\rho_{Lib})trace(\nabla_0) = 0.84.$$

The upper 95% bound for $c(\lambda, \beta)$ was determined to be $c^*(\lambda, \beta^*) = 1.08$

The pure spatial model for 2010 in Table 11 gives

$$\nabla_0 = \begin{bmatrix} 0.601 & 0.067 \\ 0.067 & 0.861 \end{bmatrix},$$
$$(\lambda_{Lab}, \lambda_{Con}, \lambda_{Lib}, \beta) = (-0.04, 0.17, 0, 0.86).$$
$$(\rho_{Lab}(\mathbf{z}_0), \rho_{Con}(\mathbf{z}_0), \rho_{Lib}(\mathbf{z}_0)) = (0.31, 0.38, 0.32).$$
$$c(\boldsymbol{\lambda}, \beta) = 2\beta(1 - 2\rho_{Lab})trace(\nabla_0) = 0.98.$$

The upper 95% bound for $c(\lambda, \beta)$ was determined to be $c^*(\lambda, \beta^*) = 1.10$. However, using the upper 95% bounds on the parameters, the Hessian for Labour was shown to still have negative eigenvalues.

Appendix 2. Tables

Survey Questions for Britain in 2005 and 2010

1. Thinking of the Euro, which of the following statements on this card would come closest to your own view?
2. The first issue is Britain's membership in the European Union. You'll see on this show card that the end of the scale marked 0 means that Britain should definitely get out of the EU, and the end of the scale marked 10 means that Britain should definitely stay in the EU. Where would you place yourself on this scale?
3. Using the 0 to 10 scale on this card, where the end marked 0 means that government should cut taxes and spend much less on health and social services, and the end marked 10 means that government should raise taxes a lot and spend much more on health and social services, where would you place yourself on this scale?

Please tick one box on each line to show how much you agree or disagree with each of these statements:

4. Immigrants make Britain more open to new ideas and cultures.
5. Immigrants take jobs away from people who were born in Britain.
6. Private enterprise is the best way to solve Britain's economic problems.
7. The government has the right to put people suspected of terrorism in prison without trial.
8. Immigrants increase crime rates.
9. Immigrants generally are good for Britain's economy.
10. Most asylum seekers who come to Britain should be sent home immediately.
11. The ability of banks and companies to move money across borders seriously undermines the British government's ability to manage the economy.
12. Big international companies are a threat to democratic government in Britain.
13. I am very concerned about the loss of British jobs to countries overseas.

Voters and Activists: 2005

14. *Voters*. Using the scale of 0–10 where 0 means very unlikely and 10 means very likely, how likely it is that you would ever vote for the following parties?…. Vote choice was given by a response >7 to this question.
15. *Activists*: Over the past few years, have you ever volunteered to get involved in politics or community affairs? Those who answered yes were coded as activists. Their response to Q.14 was used to allocate the activists to different parties.

Sociodemographics for both elections included Age, Gender, Education, Income.

Issue dimensions for 2010 from both pre- and post-election surveys

1. Overall, do you approve or disapprove of Britain's membership in the European Union? (1) Strongly approve - (5) Strongly Disapprove

Please indicate if you agree or disagree with the following policy proposals where (1) Strongly agree - (5) Strongly disagree

2. Have Britain co-operate more closely with the European Union.
3. Scrap Britain's Trident nuclear deterrent.
4. Using the 0 to 10 scale, where the end marked 0 means that government should cut taxes a lot and spend much less on health and social services, and the end marked 10 means the opposite where would you place yourself on this scale?

Please indicate if you agree or disagree with the following policy proposal where (1) Strongly agree - (5) Strongly disagree

5. Exempt the first £10,000 of earnings from income tax.
6. Charge a 'mansion' tax on properties worth over £2million.
7. Limit tax relief on pensions to the basic rate of tax.
8. Introduce new economic taxes including a fuel tax for airline flights.

Voting and Activists: 2010

Vote choice from post-election surveys

Which party did you vote for in the General Election?

(1) Labour (2) Conservative (3) Liberal Democrat (4) Scottish National Party (5) Plaid Cymru

Vote intention from pre-election surveys

If 'yes' to the question "Have you decided which party you will vote for?", which party is that?

If 'no' to the question, which party do you think you are most likely to vote for?

(1) Labour (2) Conservative (3) Liberal Democrat (4) Scottish National Party (5) Plaid Cymru

Activists and Political Influence On a scale from 0 to 10, where 10 means a great deal of influence and 0 means no influence, how much influence do you have on politics and public affairs?

Those who responded >5 were coded as activists.

Traits: 2010 (from both pre- and post-election surveys)

1. *Feeling* Using a scale that runs from 0 to 10, where 0 means strongly dislike and 10 means strongly like, how do you feel about [ ]?
2. *Competence* Using a scale that runs from 0 to 10, … how would you describe [ ]?
3. *Knowledge* When you listen to what [ ] has to say, do you think that in general he knows what he is talking about, or that he doesn't know?
4. *Interests* When you listen to what [ ] has to say, do you think he has your best interests in mind, or that he does not think about your best interests?
5. *Trustworthy* When you listen to what [ ] has to say, do you think generally that he tells the truth, or that he does not tell the truth?

Table 1
2005 UK election: Great Britain.

Party	Vote[a]%	Seats[a]	Seat %
Conservative party:	32.3	198	30.7
Labour party	35.3	356	55.1
Liberal democrat party	22.1	62	9.6
Scottish national party	1.5	6	0.9
Plaid Cymru	0.6	3	0.45
Total	91.8[b]	625 + 3[b]	96.7

[a] Percentage of total UK vote, including approx. 670,000 votes (2.6%) in N.Ireland.
[b] 3 others: 1 Independent, 1 Respect,Health Concern, 1 Green with about 5.4% vote and 0.05% seats, plus18 seats (2.8%) in N.Ireland.

Table 2
2005 Great Britain election by region.

	England			Scotland			Wales		
Party[a]	Vote %	Seats	Seat %	Vote %	Seats	Seat %	Vote %	Seats	Seat %
Con	35.6	194	36.8	15.8	1	1.7	21.4	3	7.5
Lab	35.4	286	54.3	39.5	41	69.5	42.5	29	72.5
LibDem	22.8	47	8.9	22.6	11	18.6	18.5	4	10.0
SNP	–			17.7	6	10.2			
PC	–						12.6	3	7.5
Total	93.8	527	100	95.6	59	100	95.2	39	100

SNP: Scottish National Party; PC: Plaid Cymru.
[a] Con: Conservative Party; Lab: Labour Party; LibDem: Liberal Democrat Party.

Table 3
2010 Election in Great Britain by region.

	England			Scotland			Wales		
Party[a]	Vote[b]	Seats	Seat %	Vote %	Seats	Seat %	Vote %	Seats	Seat %
Con	43.0	297	55.9	16.7	1	16.9	26.1	8	20.0
Lab	30.6	191	36.0	42.0	41	69.4	36.2	26	65.0
LibDem	26.4	43	8.1	18.9	11	18.6	20.1	3	7.5
SNP	–	–		19.9	6	10.1	–	–	
PC	–	–					11.3	3	7.5
Total	100	531	100	97.5	59	100	93.7	40	100

SNP: Scottish National Party; PC: Plaid Cymru.
[a] Con: Conservative Party; Lab: Labour Party; LibDem: Liberal Democrat Party.
[b] Percentage regional vote share across three parties.

Table 4
2005 Factor analysis.

$n = 1149$	Nationalism	Economy
1. Euro	0.30	−0.17
2. EU membership	−0.32	0.14
3. Tax/Spend	−0.10	0.39
4. Immigrant/Culture	0.32	−0.03
5. Immigrant Jobs	−0.34	−0.00
6. Free Market	−0.07	0.40
7. Terrorism	−0.28	−0.04
8. Immigrant crime	−0.38	0.02
9. Immigrant economy	0.36	−0.03
10. Asylum seekers	−0.38	0.01
11. Int. economy	−0.17	−0.48
12. Int. companies	−0.04	−0.53
13. Job loss overseas	−0.24	−0.34
Variance	0.31	0.12
Cumulative variance	0.31	0.43

Table 5
2005 Sample vote shares and ρ by region.

	Great Britain			England		
Party	S.vote[a]	ρ	[L,U][b]	S.vote[a]	ρ	[L,U][b]
Lab	0.41	0.42	[0.39,0.46]	0.36	0.38	[0.34,0.42]
Con	0.34	0.33	[0.29,0.36]	0.38	0.36	[0.32,0.40]
LibDem	0.25	0.25	[0.22,0.28]	0.25	0.26	[0.23,0.30]
c[c]	[0.62,0.84,1.08]			[0.53,0.75,1.00]		
	Scotland			Wales		
Lab	0.41	0.40	[0.34,0.47]	0.41	0.42	[0.34,0.50]
Con	0.20	0.21	[0.16,0.27]	0.26	0.25	[0.20,0.32]
LibDem	0.21	0.20	[0.16,0.26]	0.21	0.22	[0.17,0.29]
SNP	0.19	0.18	[0.14,0.24]	–		
PC				0.12	0.12	[0.08,0.17]
c[c]	[0.53,0.97,1.47]			[0.35,0.80,1.30]		

[a] Sample vote shares among respective parties.
[b] Lower and upper 95% bounds on ρ.
[c] Lower 95% bound, best estimate and upper 95% bound on c.

Table 6
2005 factor loadings for traits in Great Britain.

	Blair traits	Howard traits	Kennedy traits
Blair feeling	0.91	−0.12	
Blair competent	0.79		0.20
Blair responsive	0.86		0.13
Blair trustworthy	0.94		
Howard feeling	−0.18	0.82	
Howard competent		0.87	0.11
Howard responsive		0.78	0.17
Howard trustworthy		0.90	
Kennedy feeling			0.82
Kennedy competent	0.13		0.85
Kennedy responsive	0.14		0.83
Kennedy trustworthy	0.15	0.13	0.85
Variance	0.26	0.25	0.24
Cumulative variance	0.26	0.51	0.75

Table 9
2010 Sample vote shares and ρ by region.

	Great Britain			England		
Party	S.vote[a]	ρ	[**L**,**U**][b]	S.vote[a]	ρ	[**L**,**U**][b]
Lab	0.29	0.31	[0.29,0.32]	0.27	0.28	[0.27,0.30]
Con	0.41	0.38	[0.36,0.39]	0.43	0.40	[0.38,0.41]
LibDem	0.30	0.32	[0.30,0.33]	0.30	0.32	[0.31,0.34]
c[c]	[0.86,0.98,1.10]			[0.96,1.09,1.22]		
	Scotland			Wales		
Lab	0.36	0.36	[0.32,0.41]	0.35	0.37	[0.30,0.44]
Con	0.16	0.15	[0.12,0.19]	0.30	0.26	[0.19,0.34]
LibDem	0.23	0.23	[0.20,0.28]	0.25	0.26	[0.21,0.33]
SNP	0.25	0.25	[0.21,0.30]			
PC				0.11	0.11	[0.09,0.14]
c[c]	[1.07,1.51,1.98]			[1.53,2.12,2.75]		

[a] Sample vote shares among respective parties.
[b] Lower and upper 95% bounds on ρ.
[c] Lower 95% bound, best estimate and upper 95% bound on c.

Table 7
2005 Models for Great Britain (base LibDem).

Models		Pure spatial (1)	Traits only (2)	Spatial + Traits (3)	Spatial + Traits + Socios (4)
Party	Variable	Est (|t-stat|)	Est (|t-stat|)	Est (|t-stat|)	Est (|t-stat|)
	β	0.15*** (12.56)	–	0.06*** (3.71)	0.08*** (4.73)
Lab	λ_{Lab}	0.52*** (6.84)	0.19 (1.84)	0.18 (1.68)	0.70 (1.43)
	Blair trait		1.72*** (12.83)	1.72*** (12.87)	1.74*** (12.86)
	Howard trait		−0.63*** (5.25)	−0.64*** (5.34)	−0.64*** (5.30)
	Kennedy trait		−0.74*** (6.78)	−0.71*** (6.42)	−0.70*** (6.21)
	Age				−0.01 (1.66)
	Education				0.03*** (0.39)
	Gender				−0.11 (0.60)
	Income				0.0 (0.04)
Con	λ_{Con}	0.27*** (3.22)	−0.28* (2.32)	−0.26* (2.18)	−2.63*** (4.42)
	Blair trait		−0.83*** (6.46)	−0.72*** (5.48)	−0.66*** (5.04)
	Howard trait		1.90*** (12.25)	1.79*** (11.29)	1.72*** (10.67)
	Kennedy trait		−1.31*** (10.26)	−1.15*** (8.56)	−1.16*** (8.35)
	Age				0.02** (2.91)
	Education				0.13 (1.69)
	Gender				0.05 (0.24)
	Income				0.14*** (4.08)
n		1149	1149	1149	1149
Log Likelihood		−1136	−754	−748	−728
AIC		2279	1518	1505	1475
McFadden's R^2		0.08	0.39	0.40	0.41

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Table 8
2010 Factor analysis.

	Nationalism	Economy
1. EU membership	0.89	
2. EU cooperation	0.85	0.18
3. Nuclear plan	0.28	0.41
4. Tax-spend	−0.34	−0.37
5. Tax exemption		0.39
6. Mansion tax	0.13	0.64
7. Tax relief		0.30
8. Ecotax	0.28	0.39
n	6409	
Variance	0.224	0.142
Cumulative Variance	0.224	0.366

Table 10
2010 Factor loadings for traits in Great Britain.

		Brown trait	Cameron trait	Clegg trait
Brown	Feeling	0.87	−0.35	
	Competence	0.88	−0.30	
	Knowledge	0.81	−0.22	0.14
	Interests	0.87	−0.26	
	Trustworthy	0.87	−0.24	0.10
Cameron	Feeling	−0.38	0.83	
	Competence	−0.27	0.82	0.11
	Knowledge	−0.23	0.83	0.11
	Interests	−0.27	0.85	
	Trustworthy	−0.20	0.84	
Clegg	Feeling			0.82
	Competence			0.84
	Knowledge			0.82
	Interests	0.16		0.76
	Trustworthy	0.13	0.16	0.71
n		6218		
Variance		0.28	0.26	0.21
Cumulative variance		0.28	0.54	0.75

Table 11
2010 Models for Great Britain (base LibDem).

Models		Pure spatial (1)	Traits only (2)	Spatial + Traits (3)	Spatial + Traits + Socios (4)
Party	Variable	Est (|t-stat|)	Est (|t-stat|)	Est (|t-stat|)	Est (|t-stat|)
	β	0.86*** (38.45)		0.47*** (14.87)	0.47*** (14.71)
Lab	λ_{Lab}	−0.04 (1.31)	−0.96*** (15.20)	−0.98*** (15.59)	−0.78** (3.26)
	Brown trait		1.76*** (27.25)	1.77*** (27.32)	1.77*** (27.09)
	Cameron trait		−0.71*** (12.86)	−0.74*** (13.37)	−0.74*** (13.22)
	Clegg trait		−0.97*** (18.50)	−0.94*** (18.07)	−0.93*** (17.65)
	Age				0.01* (2.49)
	Education				−0.21*** (6.71)
	Gender				0.07 (0.85)
	Income				−0.01 (0.61)
Con	λ_{Con}	0.17*** (4.50)	−0.52*** (9.25)	−0.55*** (9.46)	−0.34** (2.85)
	Brown trait		−1.60*** (25.03)	−1.28*** (19.22)	−1.26*** (18.53)
	Cameron trait		2.75*** (32.40)	2.45*** (28.23)	2.42*** (27.71)
	Clegg trait		−1.41*** (21.86)	−1.15*** (17.24)	−1.16*** (17.23)
	Age				−0.01** (2.74)
	Education				−0.05 (1.29)
	Gender				0.17 (1.73)
	Income				0.05*** (3.32)
n		6218	6218	6218	6218
Log Likelihood		−5490	−3421	−3298	−3261
AIC		10983	6850	6606	6540
McFadden's R^2		0.19	0.49	0.51	0.52

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

References

Adams, J., 2001. Party Competition and Responsible Party Government. University of Michigan Press, Ann Arbor.

Adams, J., Merrill III, S., 1999. Modeling party strategies and policy representation in multiparty elections: why are strategies so extreme? American Journal of Political Science 43, 765–781.

Adams, J., Merrill III, S., 2001. Computing Nash equilibria in probabilistic multiparty spatial models with non-policy components. Political Analysis 9, 347–361.

Adams, J., Merrill III, S., 2002. Centrifugal incentives in multi-candidate elections. Journal of Theoretical Politics 14, 275–300.

Adams, J., Merrill III, S., Grofman, B., 2005. A Unified Theory of Party Competition. Cambridge University Press, Cambridge.

Aldrich, J., 1983. A Downsian spatial model with party activists. American Political Science Review 77, 974–990.

Ansolabehere, S., Snyder, J., 2000. Valence politics and equilibrium in spatial election models. Public Choice 103, 327–336.

Aragones, E., Palfrey, T., 2002. Mixed equilibrium in a Downsian model with a favored candidate. Journal of Economic Theory 103, 131–161.

Bernhardt, D., Duggan, J., Squintani, F., 2009a. A brief survey of rational choice models of polling. In: Aragones, E., et al. (Eds.), The Political Economy of Democracy. Fundacion BBVA, Bilbao, Spain.

Bernhardt, D., Duggan, J., Squintani, F., 2009b. The case for responsible parties. American Political Science Review 103, 570–587.

British Election Study (BES). http://www.bes2009-10.org.

Calvert, R.L., 1985. Robustness of the multidimensional voting model: candidates, motivations, uncertainty and convergence. American Journal of Political Science 29, 69–85.

Clarke, H.D., Kornberg, A., Scotto, T.J., 2009a. Making Political Choices. Toronto University Press, Toronto.

Clarke, H.D., Sanders, D., Stewart, M.C., Whiteley, P., 2005. Political Choice in Britain. Oxford University Press, Oxford.

Clarke, H.D., Sanders, D., Stewart, M.C., Whiteley, P., 2009b. Performance Politics and the British Voter. Cambridge University Press, Cambridge.

Clarke, H.D., Stewart, M.C., Whiteley, P., 1997. Tory rends: party identification and the dynamics of Conservative support since 1992. British Journal of Political Science 26, 299–318.

Clarke, H.D., Stewart, M.C., Whiteley, P., 1998. New models for New Labour: the political economy of Labour support, January 1992–April 1997. American Political Science Review 92, 559–575.

Downs, A., 1957. An Economic Theory of Democracy. Harper and Row, New York.

Duggan, J., 2006. Candidate objectives and electoral equilibrium. In: Weingast, B.R., Wittman, D.A. (Eds.), The Oxford Handbook of Political Economy. Oxford University Press, Oxford.

Duggan, J., Fey, M., 2005. Electoral competition with policy motivated candidates. Games and Economic Behavior 51, 490–522.

Ezrow, L., 2010. Linking Citizens and Parties. Oxford University Press, Oxford.

Groseclose, T., 2001. A model of candidate location when one candidate has a valence advantage. American Journal of Political Science 45, 862–886.

Huber, J., Bingham Powell Jr., G., 1994. Congruence between citizens and policy makers in two visions of liberal democracy. World Politics 1, 73–111.

McKelvey, R.D., Patty, J.W., 2006. A theory of voting in large elections. Games and Economic Behavior 57, 155–180.

Penn, E., 2009. A model of far-sighted voting. American Journal of Political Science 53, 36–54.

Riker, W.H., 1980. Implications from the disequilibrium of majority rule for the study of institutions. American Political Science Review 74, 432–446.

Roemer, J.E., 2001. Political Competition. Harvard University Press, Cambridge MA.

Roemer, J.E., 2011. A theory of income taxation where politicians focus upon core and swing voters. Social Choice and Welfare 36 (3–4), 383–422.

Sanders, D., Clarke, H.D., Stewart, M.C., Whiteley, P. Downs, Stokes and the dynamics of electoral choice. British Journal of Political Science, in press.

Schofield, N., 2005. A valence model of political competition in Britain: 1992–1997. Electoral Studies 24, 347–370.

Schofield, N., 2006. Equilibria in the spatial stochastic model with party activists. The Review of Economic Design 10, 183–203.

Schofield, N., 2007. The mean voter theorem: necessary and sufficient conditions for convergent equilibrium. The Review of Economic Studies 74, 965–980.

Schofield, N., Gallego, M., Jeon, J.-S., 2011. Leaders, voters and activists in the elections in Great Britain 2005 and 2010. Washington University in Saint Louis. http://polisci.wustl.edu/norman_schofield.

Scotto, T.J., Clarke, H.D., Kornberg, A., Reifler, J., Sanders, D., Stewart, M.C., Whiteley, P., 2010. The dynamic political economy of support for Barack Obama during the 2008 presidential election campaign. Electoral Studies 29, 545–556.

Stokes, D., 1963. Spatial models and party competition. American Political Science Review 57, 368–377.

Stokes, D., 1992. Valence politics. In: Kavanagh, D. (Ed.), Electoral Politics. Clarendon Press, Oxford.

Train, K., 2003. Discrete Choice Methods for Simulation. Cambridge University Press, Cambridge.