

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

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Oct. 26, 2011

Motivation

Electoral outcomes depend on

- ▶ policy position of candidates/parties
- ▶ valence or non-policy evaluation of parties or candidates

Valence:

- ▶ voters' perception of quality of leaders formed prior to election
- ▶ independent of party positions

Types of valence:

- ▶ **exogenous** valence: voters' aggregate perception of a leader
- ▶ **sociodemographic** valence: depends on voters' individual characteristics (e.g., income, age, gender, domicile)
- ▶ **trait** valence: voters' individual perception of a leader (e.g., honesty, trustworthiness, knowledge)

Objective

Party policy positions based on **partisan constituencies**

- ▶ at mean of supporters' preferred policies
- ▶ easy to obtain information on supporters' policy positions

Can parties gain votes by moving from partisan constituency to electoral mean?

- ▶ If valence difference is sufficiently large, parties may not converge to electoral mean.

Use valence models to compute **equilibrium candidate positions**

- ▶ determine **response** of parties to **perceived** electoral situation
- ▶ **Local Nash Equilibrium** (LNE) to vote maximizing game
- ▶ Where is **LNE** position relative to **electoral mean/origin**?

The Stochastic Electoral Model

Multidimensional finite policy space $X \subseteq \mathfrak{R}^w$

Parties:

- ▶ Each **party** j chooses a policy, $z_j \in X$, **prior** to election
- ▶ $\mathbf{z} = (z_1, \dots, z_p)$: **vector** of candidate policy positions

Party leaders maximize own vote share

- ▶ **cannot predict** vote response precisely
- ▶ rationally anticipate electoral outcome of any policy decision on **expected** vote share
- ▶ choose positions as **best responses** to other party declarations

Pure Spatial Model - Voter Behaviour

Voter's ideal point $x_i \in X_{i \in N}$

$$\Rightarrow \quad \text{electoral origin} \quad \frac{1}{n} \sum x_i = 0$$

Voter i's utility from party positioned at z_j

$$u_{ij}(x_i, z_j) = \lambda_j - \beta \|x_i - z_j\|^2 + \epsilon_j$$

- ▶ λ_j : exogenous valence of agent j s.t. $\lambda_p \geq \dots \geq \lambda_1$
- ▶ β : weight given to distance from party and voter position
- ▶ $\|x_i - z_j\|$: is **distance** between x_i and z_j
- ▶ error vector $\epsilon = (\epsilon_1, \dots, \epsilon_j, \dots, \epsilon_p)$ type I extreme value distribution

Voter Behaviour

Probability voter i chooses agent j at the vector \mathbf{z} is

$$\rho_{ij}(\mathbf{z}) = \Pr[u_{ij}(x_i, z_j) > u_{il}(x_i, z_l), \text{ for all } l \neq j]$$

\Rightarrow Expected vote share of agent j :

$$V_j(\mathbf{z}) = \frac{1}{n} \sum \rho_{ij}(\mathbf{z})$$

Probability voter i chooses j at \mathbf{z} has a multinomial logit specification

$$\rho_{ij}(\mathbf{z}) = \frac{\exp[u_{ij}^*(x_i, z_j)]}{\sum_{k=1}^p \exp u_{ik}^*(x_i, z_k)}$$

Party chooses position to maximize vote share

$$\frac{d\rho_{ij}(\mathbf{z})}{dz_j} = 2\beta(x_i - z_j)\rho_{ij}[1 - \rho_{ij}]$$

Convergence Coefficient

Probability generic voter votes for **party 1** (**lowest** exogenous valence) when **all agents** locate at the **origin**

$$\rho_1 = \left[1 + \sum_{k=2}^p \exp[\lambda_k - \lambda_1] \right]^{-1}$$

⇒ only valence **differences** matter

Convergence Coefficient:

$$c \equiv c(\lambda, \beta) = 2\beta[1 - 2\rho_1]\sigma^2$$

The Valence Theorem

Schofield (2007)

1. A necessary condition for electoral mean \mathbf{z}_0 to be a SLNE is that $\mathbf{c}(\lambda, \beta) < \mathbf{w}$
2. A sufficient condition for convergence to \mathbf{z}_0 in two dimensional case is that $\mathbf{c} < \mathbf{1}$

When $\mathbf{c} > \mathbf{w}$, to increase vote share

- ▶ lowest valence party has incentives to move away from electoral mean
- ▶ other parties respond by moving away from electoral mean

⇒ joint electoral mean cannot be an LNE

Incentive for lowest valence party is **greatest**

⇒ use **lowest valence party** to test **convergence property**

British Election 2005

Table 1. 2005 UK Election: Great Britain

Party	Vote %	Seat	Seat %
Conservative Party	32.3	198	30.7
Labor 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	625+3	96.7

- Labour: winning majority, but lost 57 seats compared to 2001
- Due to Iraq War

British Election 2005

Vote maximizing position for the parties?

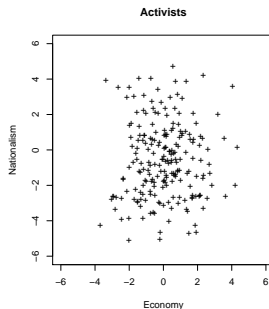
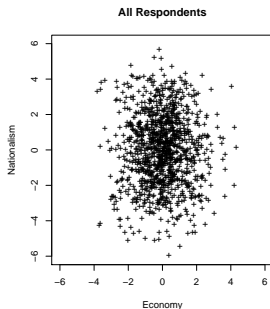
- ▶ obtain necessary informations from election surveys: policy dimensions, voter ideal points and distribution, party positions (partisan constituency)
- ▶ obtain parameter estimates from multinomial logit model:
 β, λ
- ▶ apply valence theorem: is the electoral center an LNE?
- ▶ simulation based on estimates from MNL and voter and party positions

Britain 2005: Voter Distribution

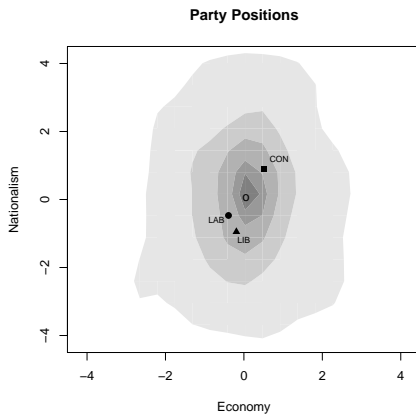
Data: BNES 2005 pre- and post-election surveys

Policy space: Two dimensions

- ▶ Economy: tax, free market etc.
- ▶ Nationalism: EU, immigration etc.



Britain 2005: Party Positions



$$z^* = \begin{bmatrix} \text{party} & \text{Lab} & \text{Lib} & \text{Con} \\ \text{Econ} & -0.39 & -0.19 & 0.52 \\ \text{Nat} & -0.47 & -0.95 & 0.91 \end{bmatrix}$$

$$\nabla_0 = \begin{bmatrix} 1.65 & 0.00 \\ 0.00 & 3.96 \end{bmatrix}$$

Britain 2005: Multinomial logit Models

Models		Pure spatial (1)	Traits only (2)	Spatial+Traits (3)	Spatial+Traits +Socios (4)
Party	Variable	Est	Est	Est	Est
	β	0.15*	-	0.06*	0.08*
Lab	λ_{Lab}	0.52*	0.19	0.18*	0.70
	Blair trait		1.72*	1.72*	1.74*
	Howard trait		-0.63*	-0.64*	-0.64*
	Kennedy trait		-0.74*	-0.71*	-0.70*
	Age				-0.01
	Education				0.03*
	Gender				-0.11
	Income				0.0
Con	λ_{Con}	0.27*	-0.28*	-0.26*	-2.63*
	Blair trait		-0.83*	-0.72*	-0.66*
	Howard trait		1.90*	1.79*	1.72*
	Kennedy trait		-1.31*	-1.15*	-1.16*
	Age				0.02*
	Education				0.13
	Gender				0.05
	Income				0.14*
Log Likelihood		-1136	-754	-748	-728
McFadden's R^2		0.08	0.39	0.40	0.41

Britain 2005: Electoral Origin LNE?

Based on the pure spatial model,

Convergence coefficient

- ▶ $c = 2\beta(1 - 2\rho_1)\sigma^2$
- ▶ $c = 2(0.15)(1 - 2\rho_1)\sigma^2$
- ▶ $\rho_1 = \rho_{LIB} = \frac{1}{1 + \exp(0.52) + \exp(0.27)} \approx 0.25$
- ▶ $\sigma^2 = \sum \text{diag}(\nabla_0) = 5.61$
- ▶ Then, $c = 2(0.15)(0.5)(5.61) = 0.84 < 1$

By convergence theorem, electoral origin is a LNE.

Simulation also shows $\forall j, z_j^{el} = (0, 0)$.

Britain 2005: Joint model simulation

Spatial+traits+sociodemographic model,

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

with voteshares $\rho^{el} = (\textit{Lab}, \textit{Con}, \textit{Lib}) = (0.41, 0.34, 0.25)$ at LNE.

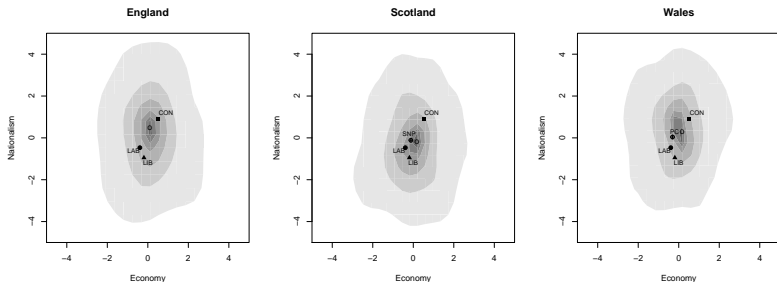
Recall

$$\mathbf{z}^* = \begin{bmatrix} \textit{party} & \textit{Lab} & \textit{Con} & \textit{Lib} \\ \textit{Econ} & -0.39 & 0.52 & -0.19 \\ \textit{Nat} & -0.47 & 0.91 & -0.95 \end{bmatrix}$$

with sample voteshares $(\textit{Lab}, \textit{Con}, \textit{Lib}) = (0.415, 0.34, 0.245)$.

British Election 2005: Regions

Two dimensions: Economy and Nationalism



<i>Party</i>	<i>Lab</i>	<i>Lib</i>	<i>Con</i>	<i>SNP</i>	<i>PC</i>
<i>x</i>	-0.39	-0.19	0.52	-0.12	-0.31
<i>y</i>	-0.47	-0.95	0.91	-0.11	0.04

2005 Region Pure Spatial Model

Region		Coef.	SE	t
England	β	0.140	0.012	11.315
base (Lib)	λ_{lab}	0.354	0.085	4.171
	λ_{Con}	0.309	0.090	3.415
n=942		LL=-944.790		
Scotland	β	0.139	0.024	5.927
base (Lib)	λ_{lab}	0.690	0.143	4.822
	λ_{Con}	0.046	0.173	0.266
	λ_{SNP}	-0.095	0.170	0.560
n=362		LL=-459.782		
Wales	β	0.106	0.026	4.133
base (Lib)	λ_{lab}	0.627	0.168	3.745
	λ_{Con}	0.106	0.192	0.554
	λ_{PC}	-0.664	0.227	2.918
n=260		LL=-327.393		

Convergent coefficient c : electoral origin a LNE.

- ▶ England 0.75
- ▶ Scotland 0.97
- ▶ Wales 0.80

British Election 2010

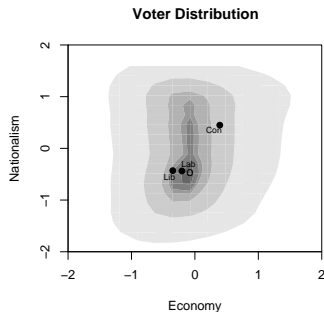
Table 19. 2010 UK Election: Great Britain

Party	Vote ¹ %	Seats ¹	Seat %
Conservative Party:	36.1	306	47.0
Labor Party	29.0	258	39.6
Liberal Democrat Party	23.0	57	8.8
Scottish National Party	1.7	6	0.9
Plaid Cymru	0.6	3	0.46
Total	90.4 ³	630 ² +1 ³	96.76

- Conservative Party's winning
- Labour leader Brown's low popularity: economic crisis, Labour party's scandal

Voters and Parties

Two dimensional policy space: Economy and Nationalism



$$\mathbf{z}^* = \begin{bmatrix} & \textit{Lab} & \textit{Con} & \textit{Lib} \\ \textit{Econ} & -0.21 & 0.39 & -0.35 \\ \textit{Nat} & -0.44 & 0.45 & -0.43 \end{bmatrix}$$

Britain 2010: MNL models

Table 27. 2010 Models for Great Britain (base LibDem)

Models		Pure spatial (1)	Traits only (2)	Spatial+Traits (3)	Spatial+Traits +Socios (4)
Party	Variable	Est	Est	Est	Est
	β	0.86***		0.47***	0.47***
Lab	λ_{Lab}	-0.04	-0.96***	-0.98***	-0.78**
	Brown trait		1.76***	1.77***	1.77***
	Cameron trait		-0.71***	-0.74***	-0.74***
	Clegg trait		-0.97***	-0.94***	-0.93***
	age				0.01*
	Education				-0.21***
Con	Income				0.07
	λ_{Con}	0.17***	-0.52***	-0.55***	-0.34**
	Brown trait		-1.60***	-1.28***	-1.26***
	Cameron trait		2.75***	2.45***	2.42***
	Clegg trait		-1.41***	-1.15***	-1.16***
	age				-0.01**
	Education				-0.05
	Income				0.17
					0.05***
LL		-5490	-3421	-3298	-3261
McFadden's R^2		0.19	0.49	0.51	0.52

- Labour party's low valence

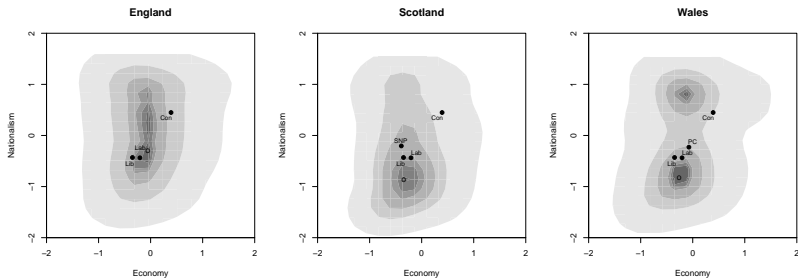
Britain 2010: Convergence

- ▶ Convergent Coefficient $c = 0.98 \Rightarrow \text{origin}=\text{LNE}$
- ▶ Confirmed by pure spatial model based simulation
- ▶ Join model based simulation gives,

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

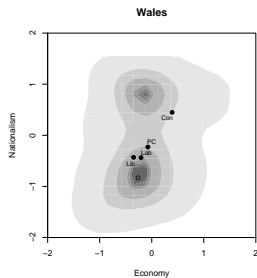
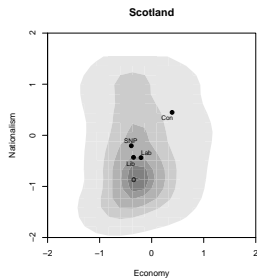
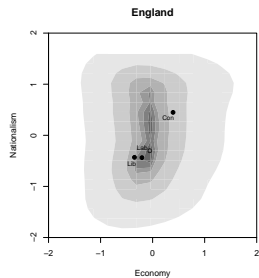
with voteshares (0.30, 0.42, 0.29)

British Election 2010: Regions



$$\mathbf{z}^* = \begin{bmatrix} & \textit{Lab} & \textit{Con} & \textit{Lib} & \textit{SNP} & \textit{PC} \\ \textit{Econ} & -0.21 & 0.39 & -0.35 & -0.39 & -0.07 \\ \textit{Nat} & -0.44 & 0.45 & -0.43 & -0.22 & -0.23 \end{bmatrix}$$

British Election 2010: Regions



$$\nabla_{eng} = \begin{bmatrix} x & x & y \\ x & 0.61 & 0.06 \\ y & 0.06 & 0.85 \end{bmatrix}$$

$$\nabla_{scot} = \begin{bmatrix} x & x & y \\ x & 0.50 & 0.05 \\ y & 0.05 & 0.89 \end{bmatrix}$$

$$\nabla_{wales} = \begin{bmatrix} x & x & y \\ x & 0.59 & 0.15 \\ y & 0.15 & 0.89 \end{bmatrix}$$

Britain 2010: Regions: MNL models

Table: Pure spatial MNL models for each regions 2010

	England	Scotland	Wales
	Coef.	Coef.	Coef.
	(t-stat)	(t-stat)	(t-stat)
β	0.86*	0.78*	0.92*
λ_{Lab}	-0.12*	0.44*	0.33*
λ_{Con}	0.21*	-0.44*	-0.02
λ_{SNP}		0.07	
λ_{PC}			-0.85*
n	5465	636	307
LL	-4769.39	-783.67	-340.78

* significant level 0.05, baseline party: Liberal Democratic Party

Britain 2010: Regions: convergence

Convergence coefficient

$$c=(\text{England, Scotland, Wales})=(1.08, 1.50, 2.12)$$

Simulation result based on pure spatial model:

Convergence to the regional origin in England and Scotland but
not in Wales

Next time

Elections in Georgia and Azerbaijan

- Anocracies
- Convergent coefficient and degree of fragmentation of polities

More practical matters if interested