The Middle Opinion. USA 2020.

Chapter 15 (pre-election draft)[1]

Mass and gravity in political space; UK 2017

Overview. The election wasn't supposed to happen in 2017 and Theresa May wasn't expected to lose her majority. The events surrounding this surprising election are discussed in the first part of the chapter and the modelling of the results is presented in the second part of the chapter.

…

The political process concentrated power, transforming the voting results into seats in parliament and into government. It changed the distribution of power. The government had lost its overall majority but as the leader of the largest party, Theresa May, reached an accord with Northern Ireland's Democratic Unionist Party and formed a minority government.

Models of the 2017 results are presented. One model represents the result as a point in percentage space. Another model uses a stepped geometric series to represent the size distribution of party votes as an order function. In a third model, as a distribution in political space.

Comparing the 2015 and 2017 elections, volatility (which is related to modular distance in percentage space) was greater for votes than it was for seats. The biggest party's share of the vote increased from 2015 to 2017 and this was reflected in a difference in the order functions. Labour in the centre-left of political space was the major gainer. Flows in political space followed a gravitational law.

The results of the 2017 election are discussed in relation to models of the party vote trajectories over the period 1945 to 2015.

1 Gordon Burt: **gordonjburt@gmail.com**. Website: **https://sites.google.com/site/gordonburtmathsocsci/all**.
October 20, 2020

Six headlines, 16th March to 9th June, 2017 [2]

March 16: "No Way to Govern"

April 19: "May heads for election landslide."

May 6: "May on course for landslide. Conservatives inflict heavy losses on Labour and Ukip in local elections."

May 31: "Shock poll predicts Tory losses."

June 8: "Tories take seven-point lead in final poll."

June 9: "May's big gamble fails."

The road to the election, 2010-2017

The general election of 2010 replaced Gordon Brown's Labour government with a coalition between David Cameron's Conservatives and Nick Clegg's Liberal Democrats. Partly to lock themselves into the coalition, the government introduced the Fixed-term Parliaments Act in 2011. It specified five-year parliaments and a requirement for parliamentary approval of any premature termination. The government duly ran its five-year course.

In 2015 David Cameron's Conservatives won an unexpected absolute majority, albeit with only a small majority of 12 seats.[3] The five-year rule meant that parliament was scheduled to run from 2015 to 2020. Following a manifesto commitment, a referendum was held in June 2016 and the

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[2] Editorial. "No Way to Govern." *The Times*, March 16, 2017: 33.
Elliott, Francis and Sam Coates. "May heads for election landslide." *The Times*, April 19, 2017: 1.
Elliott, Francis and Sam Coates. "May on course for landslide. Conservatives inflict heavy losses on Labour and Ukip in local elections." *The Times*, May 6, 2017: 1.
Coates, Sam. "Shock poll predicts Tory losses." *The Times*, May 31, 2017: 1.
The Times. "Tories take seven-point lead in final poll." *The Times, [election supplement]*, June 8, 2017, 1.
Elliott, Francis and Sam Coates. "May's big gamble fails." *The Times*, June 9, 2017: 1.

[3] Burt, Gordon. *Values, World Society and Modelling Yearbook 2015*. Newcastle: Cambridge Scholars, 2017, Chapter 10, *The UK general election, 2015*, 198-218.

majority decided, contrary to the government's preference,[4] that the UK would leave the European Union ('Brexit').[5] In the wake of this defeat, Prime Minister David Cameron resigned as leader of the Conservative Party and Theresa May took his place as leader and as prime minister, giving the assurance that the government would complete its full term of five years.

Almost a year later, the leading article in The Times on March 16th 2017 was headed "No Way to Govern". It was prompted by the latest of several government U-turns in the face of pressure from the party's own MPs. The article continued "… not having won an election herself, Mrs May feels wedded to [the 2015 manifesto]. If she wants more authority in the Commons [one option is] to get more [backbenchers] in an early general election."[6]

A few days later on March 18th there was speculation that Theresa May might call a snap election in the light of pressure on the chief whip from Conservative MPs. "The party's headquarters is strengthening its resources to fight a campaign … it was claimed yesterday that the Conservative Party chairman Patrick McLoughlin, the chief whip Gavin Williamson and the prime minister's private secretary George Hollingbery have talked about a May 4 ballot." "The party is appointing event managers, political advisers and voter communication volunteers … prospective Tory MPs … have been asked to update details ..." Andrew Gwynne, Labour's head of campaigns and elections told BBC's *Sunday Politics* that Labour would support an early election and had been making preparations for one.[7]

On 18th April 2017, UK Prime Minister Theresa May 'unexpectedly' announced that the government would put an Enabling Bill to parliament proposing that a general election be held on 8th June 2017. The Bill was duly passed, having receiving support from opposition parties as well as the ruling party. Thus the government that had been due to run from 2015 to 2020 would run for only the first two of its scheduled five years. On several occasions Theresa May had said that the government would

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[4] HM Government. *Why the Government believes that voting to remain in the European Union is the best decision for the UK*. The EU referendum, Thursday, 23rd June 2016. [A booklet delivered to all households.]

[5] Burt, Gordon. *Values, World Society and Modelling Yearbook 2016*. [In preparation.] Chapter on *The Brexit referendum*.

[6] Editorial. op. cit, March 16, 2017.

[7] Coates, Sam and Hannah McGrath. "Tory MPs pile on pressure for snap election." *The Times*, March 18, 2017: 2.
Wright, Oliver. "Labour on election footing as Tories press for early poll." *The Times*, March 20, 2017: 4.

complete its full term of five years. So what had happened to make her change her mind? She explained that she needed a fresh mandate to give her strength in the negotiations of Brexit. Her critics accused her of political opportunism and said that the real reason was the destruction of the opposition Labour Party which was polling at 25% to the Conservative Party's 43%.

Opinion polls, local elections and by-elections, May 2010 to June 2017

The opinion polls in the period between the election of 2010 and the election of 2015 exhibited a familiar pattern: support for the government declined and then recovered (Conservatives); and support for the opposition party rose and then fell (Labour). In addition to this, the Lib Dems had an early sudden large fall; and UKIP showed a steady substantial increase.

The subsequent period from the election in May 2015 to the Brexit referendum in June 2016 showed UKIP on a further rising trend and the Conservatives somewhat down; and the other parties staying much the same.

The following period from the Brexit referendum in June 2016 to the announcement of the election in April 2017 showed a large increase in the Conservatives and a modest increase in the Lib Dems; and a large fall in UKIP and a moderate fall in Labour. The first and third rows of Table 4.1 below show the opinion polls in May 2015 and April 2017: the change between the two dates is that the Conservatives are up 9% and Labour is down 8%.

In the course of the campaign, between the announcement on April 18th and election day on 8th June, the opinion polls registered 'a return to two-party politics' with substantial steadily increasing support for Labour; a fair increase then a decline for the Conservatives; a further sharp decline for UKIP; and a moderate decline for the Lib Dems and Greens.[8]

The first few weeks of the campaign coincided with the lead-up to the local elections on May 6th. May 6th marked a high point for the Conservatives, with the poll of polls just short of 50%. The local elections were held in only the more Conservative parts of England. Conservatives took control of 28 councils while Labour took control of just 9 councils. Conservatives won 1899 seats, Labour won 1152 seats. This set of local councils had had elections four years previously in 2013 and the change

[8] Ford, Robert. "The polls tighten." *The Observer*, June 4, 2017: 17.

between 2013 and 2017 was a gain by the Conservatives of 11 councils and 563 seats and a gain by Plaid Cymru of 33 seats; and losses of seats by Labour (-382 seats), UKIP (-145 seats) and Lib Dems (-42 seats).[9]

Table 4.1 General election (G), Opinion polls (O) and local elections (L), May 2015 to June 2017.[10]

.	Cons	Lab	UKIP	LibDem	SNP	Green	Ot
G: 7 May 2015	34	33	13	9	-	5	6
L: May 2016	30	31	12	15			
O: 18 April 2017	43	25	11	10	5	4	3
O: 6 May 2017	48	28	7	10	-	4	6
L: 6 May 2017	38	27	5	18			
O: 8 June 2017	44	37	4	8	-	2	6

On the morning of election day, 8th June 2017, the poll of polls, a 14-day rolling average, showed Conservatives on 44% and Labour on 37%. More up-to-date but less stable individual polls put the Conservative lead at 7%, 10% or 12%, which might translate into a Conservative majority of 50 or 100 seats. "Sources from the two main political parties believe that the Conservatives will do significantly better [than 50 seats], with both suggesting a majority of more than 80 seats."[11]

Between the general elections of May 2015 and June 2017, there were ten by-elections. The results were one Conservative gain and one Lib Dem gain, two Conservative holds and six Labour holds. By-election swings were mostly positive for Lib Dems and mostly negative for the other

[9] The Times. "Results point to landslide, say experts." *The Times*, May 6, 2017: 6.
The Times. [Local election results.] *The Times*, May 6, 2017: 6-7.
The Times. "Poll of polls." *The Times*, May 6, 2017: 8.
[10] Burt, 2017, op. cit., 210.
The Times. "Poll of polls." *The Times*, April 19, 2017: 9.
The Times. "Poll of polls." *The Times*, May 6, 2017: 8.
The Times. "Results point to landslide, say experts." *The Times*, May 6, 2017: 6.
Chorley, Matt. "Red box election countdown." Poll of polls, 14-day rolling average. *The Times*, June 8, 2017: 16.
[11] Coates, Sam and Francis Elliott. "Tory lead grows in election's final poll." The Times, June 8, 2017: 1.

parties. In particular there was no indication of an increase in the popularity of the Labour party.[12] See Table 4.2.

Table 4.2 By-election swings, May 2015 to June 2017

.	Cons	Lab	UKIP	LibD	Green	PC/[other]
3 December 2015	-9.6	+7.3	+2.8	0	-1.0	Oldham, WR
5 May 2016	-5.4	+5.9	-2.2	+1.6	-0.1	Sheffield BH
5 May 2016	-3.3	-0.3	+1.2	-	-	+5.6 Ogmore
16 June 2016	-5.8	+8.7	-1.3	-1.4	-1.5	Tooting
20 October 2016	-	Tracy Brabin		-	-	Batley & Spen
20 October 2016	-15.2	-2.2	-5.7	+23.4	-1.6	Witney
1 December 2016	[-13.1]	-8.7	-	+30.4	-	Richmond Park
8 December 2016	-2.7	-7.1	-2.2	+5.3	-	[+3.6] Sleaford NH
23 February 2017	+8.5	-4.9	-9.0	+3.8	-1.3	Copeland
23 February 2017	+1.8	-2.2	+2.1	+5.7	-2.2	Stoke Central
no. of increases	2	3	3	6	0	2
no. of decreases	7	6	5	0	6	0

The headlines on election day morning

Daily Star. Tezza vs. Jezza. Which one has the Brexit flavour for you?

[12] Parliament. "By elections in the 2015-2017 parliament." *Parliament*. Accessed 10 December 2017. http://www.parliament.uk/about/how/elections-and-voting/by-elections/by-elections-since-2015-general-election/.

The Sun. We've had enough of Jezza's rubbish. VOTE TORY.
Don't chuck Britain in the COR-BIN.
terrorists' friend; useless on Brexit; destroyer of jobs; enemy of business; massive tax hikes; puppet of unions; nuclear surrender; ruinous spending; open immigration; Marxist extremist.

Daily Express. Vote for May today. PM: the future of our country depends on it.

Daily Mail. Let's reignite British spirit. Theresa's rallying cry as she warns Corbyn will tax your work, your garden, your home and your inheritance.

Daily Telegraph. Your country needs you. Back me if you believe in Britain says May in final appeal to nation. Corbyn would not be allowed into security services. So he's not fit for No. 10.

The Times. Tories take seven-point lead in final poll.

I. X marks the spot As Britain goes to the polls, eight leaders make a final appeal for support.

The Guardian. Corbyn and May make last pitch for votes after bruising campaign.

Daily Mirror. Lies, damned lies and Theresa May. Don't condemn Britain to five more years of Tory broken promises.

The exit poll

The polling stations closed at 10pm on Thursday 8th June 2017. At 10pm the BBC reported the result of the exit poll. A shock! It predicted a hung parliament: the Conservatives would win 314 seats, falling short of the 326 needed for an absolute majority. Conservatives would have 43% of the vote (1% less than in the final poll of polls in Table 6.1 above); and Labour would have 41% (4% more than in the final poll of polls).

Later it was to turn out that the exit poll was very close to the actual result. How did it manage to be accurate while all the other polls were adrift? An important reason is that whereas the other polls were asking people how they would vote (assuming they would vote) days in advance, in contrast the exit poll was asking those who had voted just a few minutes

earlier, how they had voted. The poll was taken at polling stations and hence could be analysed constituency by constituency. Also the exit poll took a large sample and was less exposed to sampling bias. Matt Singh provides a very useful account.[13]

As an aside it is worth noting that the exit poll is a tribute to the impatience of society. The television companies, newspapers and their audiences were unwilling to wait the twelve hours until the actual result would be known.

The result

The final result was very close to that predicted in the exit poll – and hence somewhat adrift from the pre-election-day opinion polls. Conservatives won 314 seats, falling short of the 326 needed for an absolute majority. So there was a hung parliament. Conservatives had 42% of the vote (somewhat less than the poll of polls in Table 4.1 above) and Labour 40% - substantially more than in the poll of polls. See Table 4.3.

Table 4.3 UK general election, 2017: final poll of polls; exit poll; and result, 8th June 2017

.	Cons	Lab	UKIP	LibD	SNP	Green	Ot
poll of polls	44	37	4	8	-	2	6
exit poll	43	41					
result	42.4	40.0	1.8	7.4	3.0	1.6	3.8

Table 4.4 below shows how the political system allocated political power on the basis of the results - how votes became seats and how seats gave rise to the prime minister, cabinet and government. The table gives the percentage votes and the percentage seats for the parties, and also the seat/vote percentage ratios. The ratios give some notion of the fairness of the system on this particular occasion. The system has a small bias in favour of the Conservatives and a large bias in favour of the SNP and the two largest Northern Ireland parties. The system is fair towards Labour

[13] Singh, Matt. "What are exit polls and are they reliable? In the past 25 years, the largest party's total has never been wrong by more than 15 seats." *Financial Times*, June 8, 2017.

and Plaid Cymru: the vote and seat percentages are the same. The system is strongly biased against UKIP and the Greens – and to a slight extent against the two smaller Northern Ireland parties.

The seat-to-government system is 100% biased in favour of the winning party who gain monopoly control over the roles of prime minister and, by the prime minister's choice, the cabinet and government. The situation on this occasion is somewhat different in that the biggest party does not have a majority of the seats and struggled to reach an accord with the Ulster Unionists.

The table also gives the party representation in the House of Lords (this is not affected by a general election).

Table 4.4 Power allocation, UK 2017: votes, seats, vote-seat ratio, prime minister, cabinet, accord* [14]

	votes %	seats %	seat/vote	PM	cabinet	Lords
*Conservative	42.4	48.9	1.15	100	100	32
Labour	40.0	40.3	1.01			25
Liberal Democrat	7.4	1.8	0.25			13
SNP	3.0	5.4	1.79			
UKIP	1.8	0.0	0			
Green	1.6	0.2	0.10			
*DUP	0.9	1.5	1.71			
Sinn Fein	0.7	1.1	1.54			
Plaid Cymru	0.5	0.6	1.00			
UUP	0.3	0.0	0			
SDLP	0.3	0.0	0			
Other	1.2	0.0	0			30
Total	100	100				100
Turnout		68.7%				

Note: 'Other Lords': crossbenchers 22%, non-affiliated 4%, bishops 3%, other 2%

[14] BBC. "Election 2017. Results." *BBC*. Accessed 10 December 2017. http://www.bbc.co.uk/news/election/2017/results.
Parliament. "Lords by party, type of peerage and gender." *Parliament*. Accessed 10 December 2017. http://www.parliament.uk/mps-lords-and-offices/lords/composition-of-the-lords/.

The aftermath

The results produced a 'hung parliament': there was now no longer any party with an overall majority. The same situation had occurred in 2010. It was not clear at that time what should happen in such a situation and so a rule book was established by the civil service to suggest a procedure.[15] What happened in 2017 was that the Conservatives had intensive discussions with Northern Ireland's DUP about the conditions for the DUP's support for a Conservative minority government.

Some 'big names' failed to be re-elected: several ministers, former Lib Dem leader Nick Clegg, SNP former leader Alex Salmond and SNP leader in the House, and UKIP leader Paul Nuttall. Certain parties were now no longer represented in parliament: UKIP and Northern Ireland's UUP and SDLP.

Party leaders' positions were affected by the results. Labour's Jeremy Corbyn was very much strengthened. UKIP's Paul Nuttall resigned. SNP's Nicola Sturgeon was weakened. Having so dramatically failed to gain the expected landslide the Conservative's Theresa May was considerably weakened. Theresa May's advisers resigned and the resignation of Theresa May herself was debated. In the event Theresa May continued as prime minister but came under pressure from all sides as the headlines in the days that followed indicate:

June 2017
8 Tories take seven-point lead in final poll
9 May's big gamble fails
10 May stares into the abyss
May fights to remain PM [Daily Telegraph]
From hubris to humiliation [Guardian]
10/11 May clings to power as new front opens in Brexit battle [FT]

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[15] Bush, Stephen and Patrick Maguire. "Election 2017: what happens if there's a hung parliament?" *New Statesman*. June 9, 2017. Accessed 12 December 2017. http://www.newstatesman.com/politics/june2017/2017/06/election-2017-what-happens-if-theres-hung-parliament.
Hennessy, Peter. "'People need to be ready for longer coalition talks' – Peter Hennessy interviews former cabinet secretary Gus O'Donnell." Cabinet Service World. April 22, 2015. Accessed 12 December 2017. https://www.civilserviceworld.com/articles/interview/people-need-be-ready-longer-coalition-talks-peter-hennessy-interviews-former.
Cabinet Office. "Cabinet Manual." Cabinet Office. December 14, 2010. Accessed 12 December 2017. https://www.gov.uk/government/publications/cabinet-manual.

11 Down and out? … political breakdown. Five cabinet ministers urge Boris to topple May. As Churchill said, a bad leader must be poleaxed … [Sunday Times]
[Sunday Telegraph]
May's premiership in peril [Observer]
12 May signals soft Brexit in cabinet reshuffle
13 Austerity is over, May Tells Tories
14 Drop Brexit trade plan, Hammond tells Tories
15 [Disaster in 15 minutes]
16 Corbyn: seize properties of the rich for Grenfell homeless
17 May takes cover
18 Big business leaders press PM to rethink hard Brexit [Observer]
19 Hammond sinks knife into May for 'mistakes'
20 [Jobless 'lone wolf' held over attack on mosque]
21 DUP threat to walk out from talks with Tories
22 May facing revolt over Brexit laws
23 May says 3m citizens can stay in Britain
24 [Manchester killer used YouTube to build bomb.]
25 'Back soft Brexit', unions tell Labour
26 May aims to throw out EU inmates after Brexit
27 May buys DUP support with £1 billion 'bung'
28 May's top team splits over Brexit

The prime minister continued to be under pressure for the rest of the year and into 2018:[16]

January 8, 2018
May ready to replace top ministers … Johnson, Rudd, Hammond to remain after shuffle.
Mission critical. Theresa May's plan to reshuffle her cabinet shows she still has the authority to do so, but it must also demonstrate that her government has a purpose.

January 9, 2018
Greening quits in shambolic reshuffle. Education secretary rejects PM's job offer. … Top team remain in their posts.

[16] Elliott, Francis. "May ready to replace top ministers." *The Times*, January 8, 2017: 1, 7.
Editorial. "Mission critical." *The Times*, January 8, 2017: 29.
Elliott, Francis. "Greening quits in shambolic reshuffle." *The Times*, January 9, 2017: 1, 9.
Coates, Sam, Henry Zeffman and Grant Tucker. "Defiance and derision greet May's day of mixed messages." *The Times*, January 9, 2017: 8- 9.
Editorial. "Reshuffle ruffled." *The Times*, January 9, 2017: 29.

Defiance and derision greet May's day of mixed messages.
Reshuffle ruffled. Theresa May has demonstrated nothing so much as her inability to move ministers around if they refuse to cooperate. This augurs ill for the future of the government.

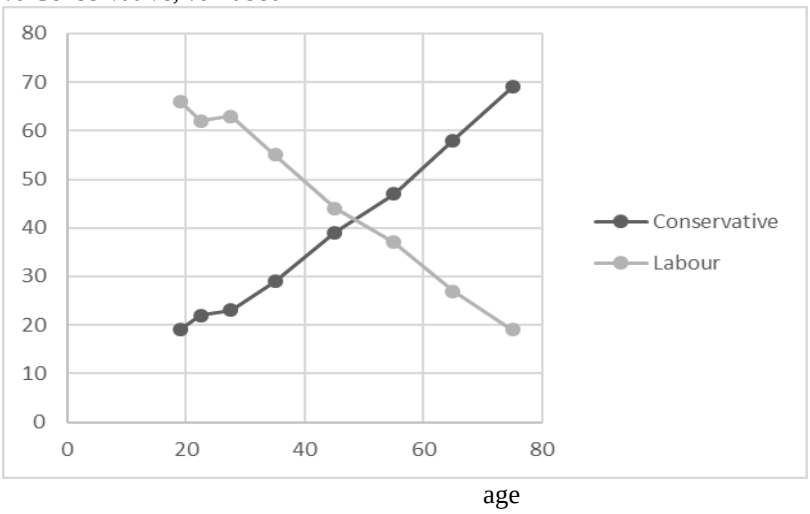
How social groups voted[17]

Gender had a very weak link with party preference. The percentage of men voting Conservative was 45% and the percentage of women voting Conservative was 43%, a difference of just 2%.

Age had a very strong link with party preference. Figure 4.1 shows the almost exact linear relationship. Older people were more likely to vote Conservative and less likely to vote Labour. The following equations hold approximately. In Figure 4.1 the age is taken as the mid-point of the range, for example 55 for the range 50-59.

% Conservative = age – 5
% Labour = 90 – age

Figure 4.1 Conservative and Labour vote as a function of age



[17] Curtis, Chris. "How Britain voted at the 2017 general election." *YouGov News*. June 13, 2017. Accessed: 18 January 2018. https://yougov.co.uk/news/2017/06/13/how-britain-voted-2017-general-election/.

Newspaper readership had a very strong link with party preference. Figure 4.2 shows the percentage Conservative vote for the readership of each newspaper and also the percentage of all newspaper readers who read that particular paper. It might be said that each newspaper has a niche in a one-dimensional political space and the niches are fairly equally spaced along the political continuum. The location on the continuum is consistent with the content of the front-page headlines on election day reported in an earlier section. Note that just half the sample reported readership of a newspaper (55%).

Figure 4.2 Newspapers: Conservative vote; and share of readership

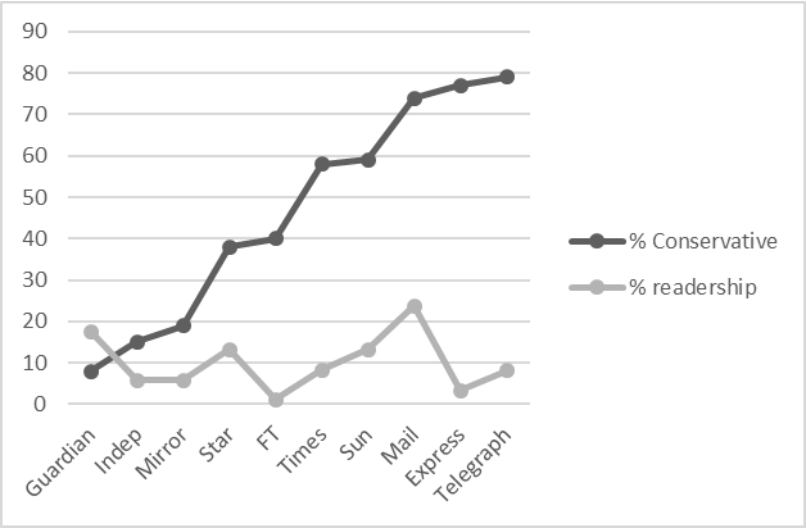


Table 4.5 (on the next page) considers the percentage vote for the Conservatives in various categories of social group. The list of categories in order of increasing range, from a weak to a strong effect on party preference, is: gender, class, job sector, home, education, work, nation, age and media (newspaper readership).

The groups which are most Conservative in each category are: male, C2 (and AB), private sector, home-owning, low education, retired, in England, over 70 and reading the Daily Telegraph. The groups which are least Conservative in each category are: female, C1 and DE, public sector, neither owner nor renting, high education, student, in Northern Ireland, 18 to 19 years old and reading the Guardian. The largest range is for

newspaper readership but that only relates to half the population (55%). The next largest range is for age and the age effect is implicit in some of the other categories such as home, education and work. The low range for social class contrasts with the strong but declining class effect in earlier decades.

Table 4.5 The percentage Conservative vote in different categories of social group

	gender	class	sector	home	educ	work	nation	age media
% range	2	6	11	21	23	44	45	50,71
Daily Telegraph								79
Age 70+								69
Retired						63		
Low education					55			
Owner				53				
Private sector			50					
C2		47						
AB		46						
England							45.6	
Medium educ.					45			
Male	45							
Female	43							
C1		41						
DE		41						
Part-time						40		
Full-time						39		
Public sector			39					
Not working						36		
Wales							33.6	
Rent				32				
Neither owner/rent				32				
High educ.					32			
Scotland							28.6	
Unemployed						28		
Student						19		
Age 18-19								19
Guardian								8
Northern Ireland							0.5	

Table 4.6 below compares the range in the Conservative vote with the range in the Labour vote for different categories of social group. The ranges are almost identical. As one would expect the relationships are reversed: social groups (for example, Telegraph readership) which are high-vote Conservative are low-vote Labour; and vice-versa, for example, Guardian readership.

Table 4.6 The range in percentages in Conservative and Labour vote in different categories of social group

gender	class	sector	home	educn.	work	nation	age	media
Conservative								
2	6	11	21	23	44	45	50	71
Labour								
4	6	10	20	16	40	49	47	61

Regions … the contour structure for Conservative seats

Table 4.5 above has indicated that the different nations in the UK vote differently: the Conservative vote in England is higher than the Conservative vote in both Scotland and Northern Ireland. We now show that different regions within England vote differently and so have different percentages of Conservative seats. In each of the regions in the Midlands and the South of England (with the exception of London) more than 59% of the seats are Conservative. These regions form a single geographically connected bloc (with a hole in the middle due to the absence of London). In the North of England and in Scotland, Wales and Northern Ireland and in London, less than 32% of the seats are Conservative. These regions form one single geographically connected bloc; and London is isolated on its own in the south.

Table 4.7 explores this geographical pattern more systematically and in greater detail by looking at the contour structure. First we note the network of adjacent regions. Next we use x to refer to the percentage of Conservative seats in a region. We refer to x as the contour level – by analogy with the contours of height above sea level in maps of physical geography. For each level x we partition the set of regions into two sets: an ‘at or above’ set A of regions equal to or above x; and a ‘below’ set B of regions below x. Finally we identify connected subsets in A and in B.

Table 4.7 gives different contour levels x; it identifies the sets A and B for each level of x; it separates set B into geographically connected subsets, and it does the same for set A; and finally it notes the number of subsets in A and in B. (Regions which are equal to x are indicated with a *)

Set A spreads out from a peak Conservative seat percentage of 86.7% in the south-east, and encompasses adjacent regions in the following order: east, then south-east, east midlands and west midlands. Set B starts with (from the bottom up) a low Conservative seat percentage of 0% in Northern Ireland and then 10% in the north-east, 20% in Wales and encompasses adjacent regions: Scotland, then north-west and Yorkshire & Humberside.

Table 4.7 The contour structure for regions; x is % Conservative seats
L: London; NI: Northern Ireland

x%	B: below x	A: at or above x	B,A
100	UK		1,0
86.7	UK-A	south-east*	1,1
86.2	UK-A, L	(south-east, east*)	2,1
85.5	UK-A, L	(south-east, east, south-west*)	2,1
67.4	UK-A, L	(s-east, e, sw, east midlands*)	2,1
59.3	(NI, nw, ne, yh, Sc., W); L	(s-east, e, sw, e mid, w mid*)	2,1
31.5	(NI, nw, ne, Sc., W); L	England incl. Yorks & Humber*, not B	2,1
29.2	(NI, nw, ne, Scot. Wales)	England including London*, not B	1,1
26.7	(NI, n-east, Scot.); Wales	England including north-west*, not B	2,1
22.0	NI; north-east; Wales	UK including Scotland*, not B	3,1
20	N. Ireland; north-east	UK including Wales*, not B	2,1
10	N. Ireland	UK including north-east*, not B	1,1
0		UK including N. Ireland	0,1

Modelling the election results

The result: a point in percentage space

In this and the next two sections we look back at the results in Table 4.4 and think of them in geometric terms. In this section we think of the twelve voting percentages (the first column in Table 4.4) as a column vector $\underline{v}$ representing a point V. Because the column has twelve

percentages adding up to 100%, the point V is a point in 12-dimensional percentage space. Similarly the twelve seat percentages (the second column in Table 4.4) correspond to a column vector $\underline{s}$ representing a point S in percentage space. The centre G of this space, vector $\underline{g}$, is the point (8.3%, 8.3%, … 8.3%), where 8.3%=100%/12. The distances between the points V, S and G are given in the matrix below. See Table 4.8. Both votes V and seats S are a large distance from the centre G and a small distance from one another. (The distance d between v and s is: $d(\underline{v},\underline{s})=\Sigma|v_i-s_i|$.)

Table 4.8 The matrix of distances between votes V, seats S and the centre G of percentage space

.	V	S	G
V	0	20.9	131.4
S		0	145.3
G			0

The order function for party shares

What is the nature of the distribution of the votes between the parties? Commonly in elections there are a few large parties and many small parties. The results in 2017 followed this pattern with two large parties having much the same percentage of the vote, the third party having a much smaller percentage and the other parties having a gradually decreasing share.

How might we characterise the distribution mathematically? One approach is to list the parties in order from the largest to the smallest in terms of percentage vote. The percentage votes can then be thought of as a function on order space {0,1,2,3,…n,…N}. We can then enquire into the nature of the order function.

Burt (2017, 213-216, 271) supposes that party votes follow a geometric series distribution.[18] In this model the largest party has some share p of the vote and the next largest party has a share r times that, and similarly for the next again largest party, and so on.

Note that both p and r lie between 0 and 1. The value of p is given directly by the share obtained by the largest party, but what about the value of r? Under certain assumptions r=(1-p). An alternative is that we

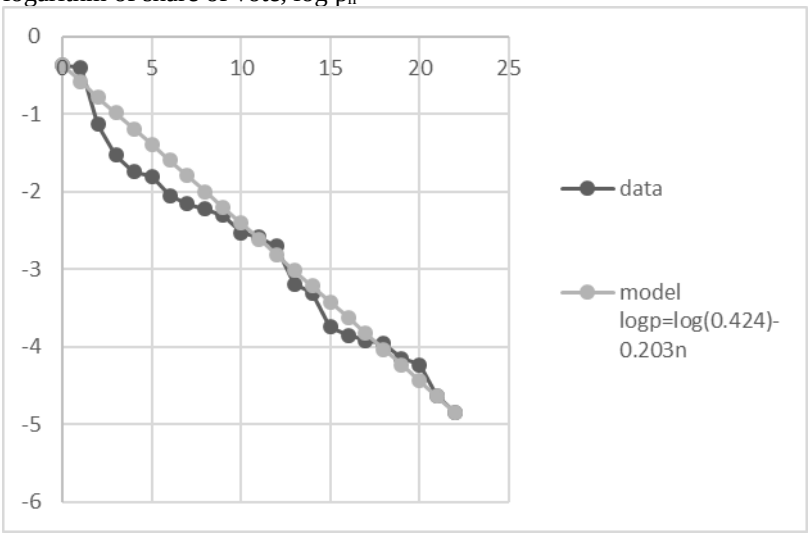
[18] Burt, 2017, op. cit., 213-216, 269-271.

take *the model value* of r to be the geometric mean r^ of *the data values* of r_i where $r_i=p_{i+1}/p_i$. In a geometric series r_i is constant and so r^=r. In general the value of r^ is given by $\log r^=(\log p_N-\log p_0)/N$ where N+1 is the number of parties. The model then becomes $\log p_n=\log p_0+n\log r^$. Logarithms to the power 10 are used for ease of interpretation.

We consider the top 21 parties and also a category labelled 'other' which had 0.6% of the vote and one MP. Figure 4.3 presents the distribution of votes in the UK general election in 2017 and compares the data with a geometric series model where $p_0=0.424$, $r=0.627$ (p_0 is the 42.4% gained by the largest party, the Conservatives). The model is $p_n=0.424(0.627)^n$, or in logarithms: $\log(p_n)=\log(0.424)+ n\log(0.627)$.

There is quite a good fit for the later smaller parties but (after indicating an above-the-line vote for second-placed Labour) the first part of the series drops away sharply for the Liberal Democrats and SNP and then gradually returns to the line for the model. The curve shows some fluctuation between steep and shallow descent, suggestive of steps. The top step has the Conservative and Labour shares. The geometric series distribution is not followed exactly but still provides a useful standard model of comparison with deviations from the model being noted. We might refer to this as a stepped geometric series model.

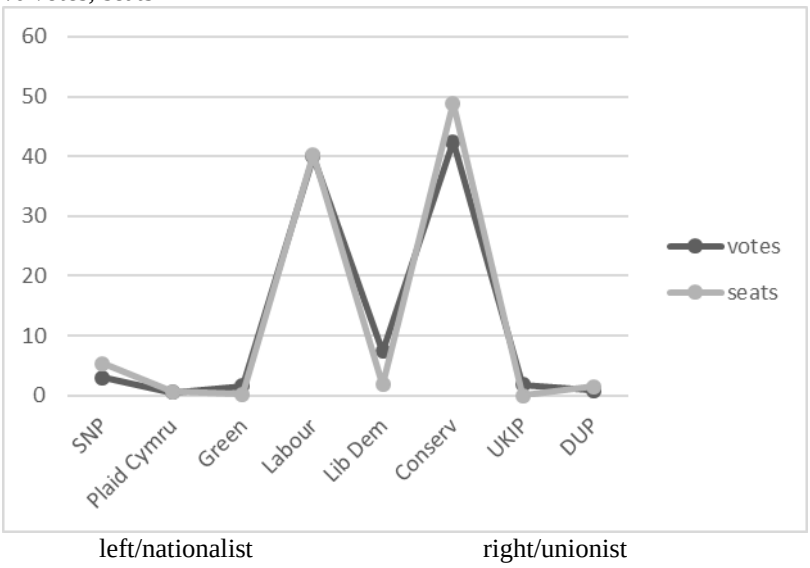
Figure 4.3 Shares of the vote, UK 2017, $p_n=0.424(0.627)^n$



The distribution of voters in political space (and of seats)

We now think of voters and parties as having a position in a political space. The population of voters has a distribution over political space. The percentage vote for a party reflects how the position of the party relates to the position of the other parties and to the distribution of voters.
The nature of political space is discussed extensively elsewhere.[19] It is common to think of a one-dimensional political space, the Left-Right political continuum. The continuum in the UK (apart from Northern Ireland) places Labour on the left and Conservatives on the right as the two major established parties, with the Liberal Democrats the established party of the centre. Outside these established three parties are Green, Plaid Cymru and SNP to the left and UKIP to the right. So the continuum also has a nationalist v. unionist aspect. Northern Ireland has its own distinct parties but here also an in-depth study has identified a political space with left v. right and nationalist v. unionist aspects.[20] Figure 4.4 shows the distribution of votes and seats in political space.

Figure 4.4 The distribution of votes and seats in political space



[19] Burt, 2017, op. cit., 152-265.
[20] Burt, 2017, op. cit., 179-197.

In voting theory, the median voter is of special interest. Here, in terms of the vote, Liberal Democrats have a minority to the left of them: the combination of Labour, SNP, Green, Sinn Fein and half of 'other' had 46.6% of votes. The Liberal Democrats also have a minority to the right of them: the combination of Conservatives, UKIP, DUP, UUP and half of 'other' had 46% of votes. So the median voter was Liberal Democrat. So, according to voting theory and making the assumptions of the median voter theorem, the Liberal Democrats might be thought of as the Condorcet winners in terms of votes.

However, in terms of seats, the combined percentage for Conservatives, UKIP and DUP is 51.4%. Taking UKIP and the DUP to be to the right of the Conservatives, the median MP is Conservative. In terms of seats the Conservatives might be thought of as the Condorcet winners.

The change from 2015 to 2017

For the next few sections we consider the change between the election results of 2015 and the election results of 2017.

Volatility; distance in percentage space

Before looking at the detail of the results, it is useful to obtain some overall estimate of the amount of change. One measure of this is volatility.[21] It is the amount of change in the parties' shares of the votes (or of the seats) between two elections. It is the swing between the composite gainers and the composite losers.

The volatility in the percentage vote from 2015 to 2017 was 15.5%. In other words, the parties which increased their vote in 2017 gained an extra 15.5% and the parties which lost votes in 2017 lost 15.5%. Almost all of the gain was accounted for by Labour and Conservatives who gained a combined total of 15.1%. Most of the loss was accounted for by UKIP who lost 10.8%. The SNP lost 1.7%, more than a third of their share in 2015. In Northern Ireland DUP and Sinn Fein together gained 0.4% while the UUP and SDLP together lost 0.1%. Volatilities in the four separate nations were similar to the overall UK value of 15.5%: England 15.4%; Wales 18.4%; Northern Ireland 15.2%; and Scotland 16.5%.

The volatility in the percentage of seats from 2015 to 2017 was 6%. So in 2015-2017 the *vote volatility* of 15.5% was much more than the *seat volatility* of 6%. The parties which increased their number of seats in 2015

[21] Burt, 2016, op. cit., 121-131.

gained an extra 6% and the parties which lost seats in 2015 lost 6%. Most of the gain was accounted for by Labour who gained 4.6%. Most of the loss was accounted for by SNP and Conservatives who together lost 5.2%. In Northern Ireland, DUP and Sinn Fein together gained 0.8% while the UUP and SDLP together lost 0.8%.

Our discussion of volatility provides an overall view of the change from 2015 to 2017. Table 4.9 presents the details, showing the percentage votes and seats and the change in these percentages for the parties at the UK elections in 2015 and 2017.

Volatility V equals the modulus of the swing S, V=|S|. Because the percentages add to the fixed sum of 100%, V is also the sum G of the gains; and V is also the sum L of the losses, V=G=L. Thinking in terms of abstract space, the 2015 result is a point in percentage space and the 2017 result is a point in percentage space. The volatility V relates to the distance d between the two points in percentage space. The distance function used involves the modulus function: $d_{AB}=\Sigma|x_{Ai}-x_{Bi}|$, where d is the distance, A and B are the two points, x is the percentage, and i is the i^{th} party. We have d=G+L=2G=2L=2V.

Table 4.9 UK general election, 2015-2017: votes and seats for the parties

.	votes % 2015	votes % 2017	2017 -2015	seats % 2015	seats % 2017	2017 -2015
Conservative	36.9	42.4	+5.5	50.9	48.9	-2.0
Labour	30.4	40.0	+9.6	35.7	40.3	+4.6
Liberal Democrat	7.9	7.4	-0.5	1.2	1.8	+0.6
UKIP	12.6	1.8	-10.8	0.2	0.0	-0.2
SNP	4.7	3.0	-1.7	8.6	5.4	-3.2
Green	3.8	1.6	-2.2	0.2	0.2	0
Sinn Fein	0.6	0.7	+0.1	0.6	1.1	+0.5
Democratic Union.	0.6	0.9	+0.3	1.2	1.5	+0.3
Plaid Cymru	0.6	0.5	-0.1	0.6	0.6	0
Ulster Unionist Party	0.4	0.3	-0.1	0.3	0.0	-0.3
SDLP	0.3	0.3	0	0.5	0.0	-0.5
turnout	66.1%	68.7%				
volatility: gains=losses			15.5			6.0
distance			31.0			12.0

The change in the order function

The equations for the order functions in 2015 and in 2017 are similar. (Logarithms are to the base 10):

$\log (p_n) = \log (0.369) + n \log (0.681)$ in 2015

$\log (p_n) = \log (0.424) + n \log (0.627)$ in 2017

The graph for 2015 (not shown) has a similar appearance to the graph for 2017 - see Figure 4.3 above. The largest party in 2015 had fewer percentage votes than the largest party in 2017: 36.9% v. 42.4% and this is reflected in the constant terms of the two equations. The slope in 2015 is shallower than the slope in 2017; -0.17 in 2015 and -0.20 in 2017 (the values respectively of log(0.681) and log(0.627)).

The change in the distribution of voters in political space (and of seats)

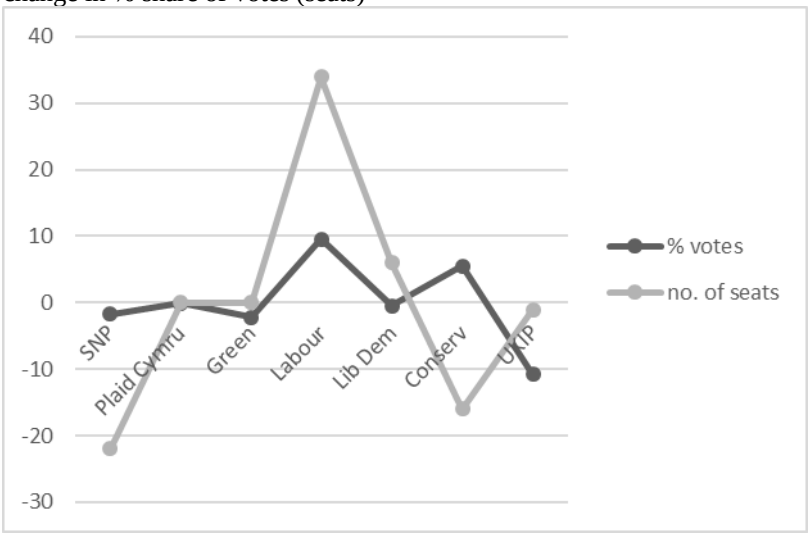
The distribution of voters on the left-right continuum was discussed in an earlier section. How does the distribution in 2017 compare with the 2015 distribution? Subtracting one distribution from the other gives the change in the distribution between 2015 and 2017 – see Figure 4.5 below. The horizontal axis orders the parties from left to right. The vertical axis gives the change in percentage between 2015 and 2017.

First, consider the voters. The change in the distribution of voters shows an M-shaped line with increased share for the two main parties, Conservatives and Labour, reduced shares at the extremes, mainly for UKIP, but without benefitting the Liberal Democrats in the centre.

Now consider seats. The consequent change in the distribution of seats shows reduced shares on the right and on the extreme left and increased share for Labour (and Lib Dems) in the centre-left.

[Note that this increased share in the centre-left in the number of seats was transformed into government with the majority Conservative government giving way to a hung parliament and a minority Conservative government – but this needed support from the DUP shifting the share of government somewhat to the right.]

Figure 4.5 The change in the distribution of voters (and of seats) in political space; UK without NI, 2015-2017



Flows in political space

We now consider how the change in the distribution of voters (or seats) in political space comes about through flows in political space. We first present a simple example to illustrate the basic ideas and then we provide an analysis of the flows of voters in political space between 2015 and 2017.

Flows in political space: a two-point space

This is quite a lengthy section. The aim is to illustrate a general point: the flow between two points in political space depends on the distance between the two points and on the size or 'mass' (percentage vote) of the two points. There is an analogy here with Newton's law of universal gravitation. See equations [4.6] and [4.7] below.

The simplest political space consists of just two points. Here we take the two points to be C and N, Conservative and non-Conservative. At any one time, people are at one or other of these two points. From one time to

the next, some people stay where they are and some people move to the other point.

In this section we consider not *voters* but *seats in parliament*. There are 650 seats in total. In 2015 the Conservatives had 330 seats and the non-Conservatives had 320. So there were 50.8% of the seats at C and 49.2% at N. We can express this as a vector, either as numbers or as percentages:

numbers in 2015	percentages in 2015
[330]	[50.8]
[320]	[49.2]

In 2017 the Conservatives had 317 seats and the non-Conservatives had 333. So there were 48.8% of the seats at C and 51.2% at N. Again, we can express this as a vector, either as numbers or as percentages:

numbers in 2017	percentages in 2017
[317]	[48.8]
[333]	[51.2]

We now look at the flow of seats between C and N. Of the 330 Conservative seats in 2015, 297 remained Conservative and 33 switched to non-Conservative. Of the 320 non-Conservative seats in 2015, 300 remained non-Conservative and 20 switched to Conservative. These four flows constitute the flow matrix. Each column adds up to give a 2015 number and each row adds up to give a 2017 number.

		Con	Non	
[317]	Con	[297	20]	
[333]	Non	[33	300]	
in 2017				
		[330	320]	in 2015

Consider the 297 which remain Conservative. The number 297 represents 45.7% of the 650 seats. We can do the same for the other numbers and obtain the percentage flow matrix. Each column adds up to give a 2015 percentage and each row adds up to give a 2017 percentage.

		Con	Non	
[48.8]	Con	[45.7	3.1]	
[51.2]	Non	[5.1	46.1]	
in 2017				
		[50.8	49.2]	in 2015

Consider again the number 297 which remain Conservative. This represents 90% of the 330 Conservative seats in 2015; and the 330 are 50.8% of the total seats. So the number 297 can be expressed in two ways.

297 =	45.7% of 650 =	90% of 50.8% of 650
	45.7% =	90% of 50.8%

This illustrates an important equation. Here F_{cc} is the overall percentage flow from C to C (45.7%); M_{cc} is the conditional percentage flow from C to C (90%); and $p_{c,t}$ is the proportion at C at t (50.8%).

$$F_{cc} = M_{cc}\, p_{c,t} \qquad [4.1]$$

In the same way that we obtained 90% (0.90 in decimals), we can do the same for the other numbers and obtain the conditional flow matrix or transition matrix. (Note that the entries are decimals corresponding to the percentages). (0.90=297/330; 0.10=33/330; and 0.06=20/320; 0.94=300/320).

.	Con	Non
Con	[297	20]
Non	[33	300]

	Con	Non
Con	[0.90	0.06]
Non	[0.10	0.94]

We can express all of this as a vector and matrix equation: the vector p_{t+1} of percentages at time (t+1) equals the transition matrix M times the vector p_t of percentages at time t.

$$p_{t+1} = M\, p_t \qquad [4.2]$$

		Con	Non	
Con	[48.8] =	[0.90	0.06]	[50.8]
Non	[51.2]	[0.10	0.94]	[49.2]

We now think of these numbers in terms of attraction. The *general* attraction of a party at a certain time is given by the numbers in the p

vectors. For example the general attraction of Conservatives in 2017 is 48.8%. (Recall that here in this section we are talking about seats). However the *specific* attraction of a party at a certain time for those in some party in a previous time is given by the numbers in the M matrix. For example the specific attraction of Conservatives in 2017 for Conservatives in 2015 is 90%.

Finally *relative* attraction is the specific attraction relative to the general attraction. Conservatives in 2017 have a general attraction of 48.8% and their specific attraction to Conservatives in 2015 is 90%; and so their relative attraction to Conservatives in 2015 is a=90.0/48.8=1.84. Similarly for the relative attraction between the other pairs of groups, giving four numbers which can be put into a matrix, the relative attraction matrix A.

relative attraction = specific attraction / general attraction

$a_{cc} = M_{cc} / p_{c,t+1}$ [4.3]
$A = M / p_{t+1}$ (element-wise division)

	Con	Non
Con	[1.84	0.12]
Non	[0.20	1.84]

Combining the two equations [4.1] and [4.3] we can deduce the equation [4] below. In other words:

Result 1 The flow F equals the 'attraction' a between the two locations *times* the 'mass' p of one location *times* the 'mass' p of the other location.

$F_{cc} = a_{cc}\, p_{c,t+1}\, p_{c,t}$ [4.4]

0.457 = 1.84 x 0.508 x 0.488

Each group has a high relative attraction to itself (1.84 and 1.84) and a low relative attraction to the other group (0.12 and 0.20).

The latter observation prompts the more general idea that relative attraction depends on distance. Low distance - nearness - gives high relative attraction; and high distance gives low relative attraction.

Here the distance of a group from itself is 0; and the distance between the two different groups can be taken as 1. Somewhat trivially the four

pairs of numbers approximately satisfy the following equation giving the relative attraction a as a function of distance r.

relative attraction = 1.84 – 1.68 distance

$$a = f(r) \qquad [4.5]$$

Substituting in the earlier equation gives the following equation. Flow between two points in political space depends on the distance between the two points and on the size or 'mass' (percentage vote) of the two points.

$$F = f(r)\, p_t\, p_{t+1} \qquad [4.6]$$

There is an analogy here with Newton's law of universal gravitation: the gravitational force F of attraction between two bodies A and B equals the product of their two masses m_A and m_B times a function f(r) of the distance r between them, where $a=f(r)=\gamma/r^2$.

$$F = a\, m_A\, m_B = f(r)\, m_A\, m_B = \gamma\, m_A\, m_B / r^2 \qquad [4.7]$$

Flows in political space: the gravitational model

We now suppose that the political stance of voters and parties can be represented as points in a continuous multi-dimensional political space.

A voter at x places a value u on a party at y. Suppose that the value depends on the spatial positions, u=u(x,y). A simple case of the value function is that it depends inversely on the distance r between the voter and the party, u=f(1/r). Value functions of this type are thus single-peaked on political space.

For some purposes the situation can be approximated to by points in a single 'primary' or 'first principal component' dimension.

Over time, voters and parties change their position in political space. For some purposes it is the relative positions of voters and parties which matters. Here we suppose that the parties stay fixed and that the voters move. Party votes change as a result of the flows of voters in political space.

In Northern Ireland and in mainland Britain the primary dimension can be thought of as a left-right continuum, associated with a nationalist-unionist aspect. The ordering of the parties is that used earlier. The parties are assumed to be equally spaced along the continuum. (Alternatively,

equally spaced parties can be used as an assumption to define distance along the continuum).

We are interested in the flow of voters in political space between the elections of 2015 and 2017. The data we use comes not from the (unavailable) actual votes but from a survey - the General Election Day Poll 2017 with fieldwork carried out during 6th to 9th June 2017 by Lord Ashcroft Polls. The sample were asked which party they voted for in 2015 and in 2017. A cross-tabulation of the answers to these two questions was provided in the report.[22]

We now analyse this data, following the method used in the previous section. From the table in the report we note the percentage votes for each party in 2015 and in 2017; and the entries in the transition matrix M giving the flows between parties. From these we deduce the relative attraction matrix A, see Table 4.10 below. Note that the parties are listed in the order of their location on the primary dimension in political space.

Note also that each entry is a value of relative attraction. For example the relative attraction of Labour in 2017 for Greens in 2015 is a=1.5. This comes from a=m/p, where m=58% is the proportion of Greens in 2015 voting Labour in 2017, and p=38% is the percentage vote for Labour in 2017 in the sample.

The highest values in the matrix are for self-attraction – see the asterisked entries in the main diagonal. The lowest self-attraction is for the two main parties, Conservative (2.0) and Labour (2.2). Next is the third party Lib Dems (5.6) followed by the outsider parties UKIP (6.3) and Greens (11), and finally the two nationalist parties, SNP (19.8) and Plaid Cymru (50). (Thus self-attraction increases as the size of the party vote decreases.)

The asterisked self-attraction entries are peaks in their own rows and their own columns. Moreover each row and each column tends to be single-peaked. In other words (noting that the matrix orders the parties by political distance) relative attraction falls off with distance.

The matrix is somewhat symmetrical but not entirely so. For example the relative attraction (1.5) of Labour in 2017 for Greens in 2015 is not the same as the relative attraction (0.5) of Greens in 2017 for Labour in 2015. One might say that Labour had increased its attractiveness relative to the Greens between 2015 and 2017. In general the greatest asymmetries

[22] There were 14,384 respondents, 64% voting in person and 36% voting by post and 0.2% by proxy. Lord Ashcroft Polls. "General Election Day Poll 2017." *Lord Ashcroft Polls*. Full Tables. Table 2, page 5.
http://lordashcroftpolls.com/wp-content/uploads/2017/06/GE-post-vote-poll-Full-tables.pdf.

between 2015 and 2017 were for Labour, the biggest gainer in 2017, and for UKIP, the greatest loser in 2017. The greatest symmetry was for the Lib Dems whose vote share stayed the same.

Table 4.10 The relative attraction matrix A, voters in 2015 and 2017

	Party voters in 2015						
.	SNP	PC	Lab	Green	LibD	Cons	UKIP
Party voters in 2017							
SNP	19.8*	0	0.3	0.5	0.3	0	0
PC	0	50*	0.01	0.3	0.02	0.004	0.04
Lab	0.3	1.1	2.2*	1.5	0.8	0.3	0.4
Green	0	0.5	0.5	11*	1.0	0.5	1.0
LibDem	0.2	0.3	0.6	1.3	5.6*	0.6	0.3
Cons	0.1	0.1	0.2	0.1	0.4	2.0*	1.4
UKIP	0	0	0.3	0.3	0.3	0.3	6.3*

We need to take care and work either with the rows or with the columns. The Labour column is the relative attraction of various parties in 2017 for Labour in 2015; and the Labour row is the relative attraction of Labour in 2017 for various parties in 2015.

It possibly makes sense to start with the party voters in 2015 and so in what follows I shall focus on the columns.

Figure 4.6 plots the relative attraction of parties in 2017 for those voting Labour in 2015; and for those voting Conservative in 2015. The parties are ordered according to the primary continuum and so the order conveys distances in political space.

Figure 4.7 gives similar information for Lib Dems, UKIP and Greens in 2015; and Figure 4.8 gives similar information for Plaid Cymru and SNP in 2015.

Figure 4.6 The relative attraction of parties in 2017 for Labour in 2015; and for Conservatives in 2015
relative attraction of parties in 2017

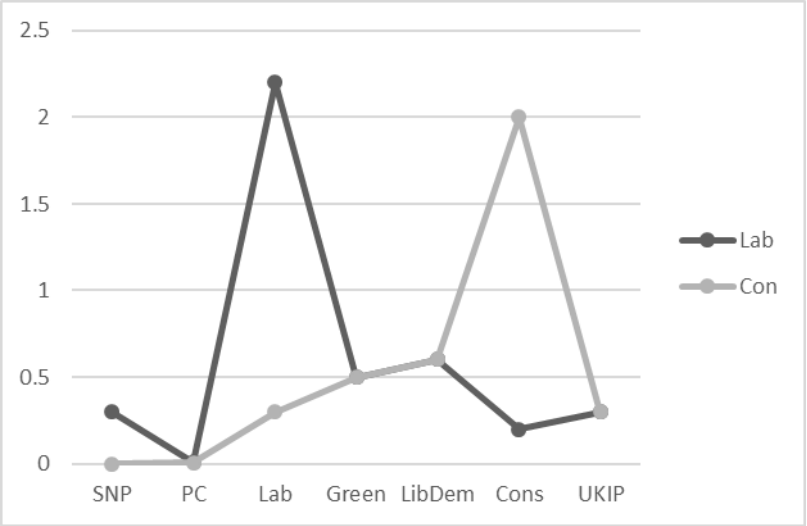


Figure 4.7 The relative attraction of parties in 2017 for Lib Dems in 2015; and for UKIP and for Greens in 2015
relative attraction of parties in 2017

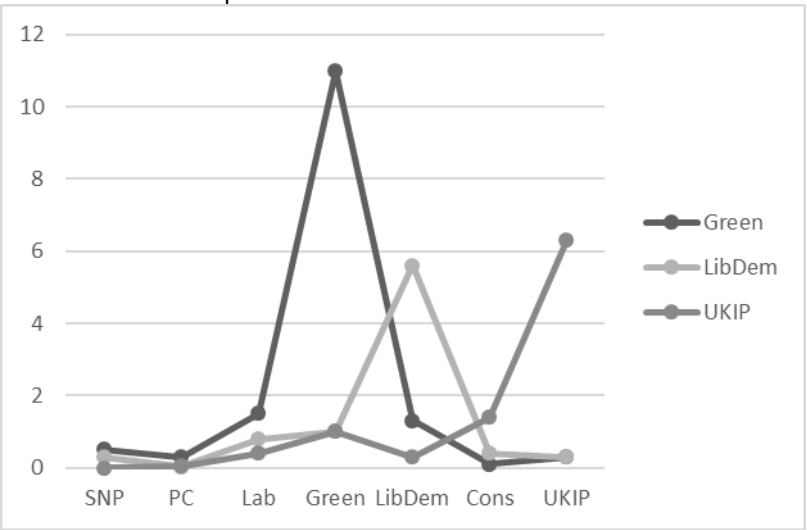
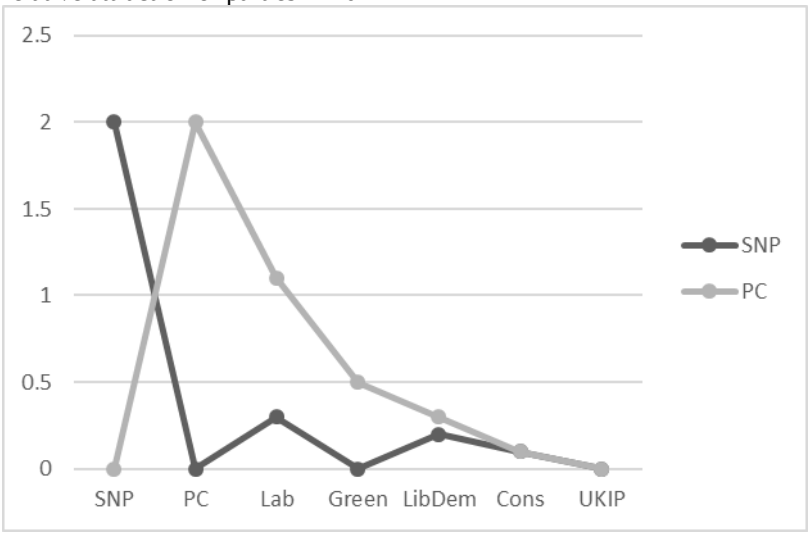


Figure 4.8 The relative attraction of parties in 2017 for Plaid Cymru in 2015; and for SNP in 2015. [See comment below about the peaks.]



[The peaks in Figure 4.8 are actually very high but here have been set at 2 so that the rest of the function can be seen more clearly.]

Conservative and Plaid Cymru have single-peaked functions and the others are approximately single-peaked. Some of the peaks are exceptionally high.

Ignoring its high peak and the SNP point, the Plaid Cymru function is an ideal type showing a smooth decrease – an exponential decrease of relative attraction a with distance r: $\log_{10}(a)=0.4\text{-}04r$. So $a=10^{0.4-0.4r}$, and, substituting in equation [6] of the previous section,

$$F_{pc,x} = (10^{0.4-0.4r(pc,x)})\, p_{t,pc}\, p_{t+1,x}$$

Taking the results overall, the conclusion is that relative attraction is approximately single-peaked in a one-dimensional political space and hence that flows approximate to that specified in equation [4.6].

The 2017 results and the 1945-2015 trajectories

We now relate the results of the 2017 election to the party vote trajectories over the period 1945 to 2015. In a previous analysis, simple autoregressive models and binary equilibrium models explained about half the variance in the time series. The time series for each individual party was considered and also the time series for the 'competition hierarchy'.[23]

In the simple autoregressive models, the expectation is that that the next observation will be between the previous observation and the equilibrium, but that there is random error.

In the binary models the expectation is that that the next observation will be in either a high or a low state, and will be at the corresponding high or low equilibrium, but that there is random error. The expectation is that the state will be the same as that for the previous observation.

Because of random error there is no reason to suppose that one election's results relate to the model parameters. The following remarks are therefore somewhat speculative and relate to Table 4.11.

The Conservative 2017 vote has shot the other side of the AR equilibrium; and although it is close to the higher equilibrium of the binary model, this model was not a good fit in general. The Labour 2017 vote also has shot to the other side of the AR equilibrium; and it is halfway between the two equilibria of the binary model. As in 2015, the LibDem 2017 vote is near the lower equilibrium of the binary model.

Table 4.11 The 2017 results and the 1945-2015 trajectory parameters

.			……..models …….		
.	2017	2015	……equilibria……		
.	results	results	AR	binary 1	binary 2
Cons	42.4	36.9	40.5	38.1	42.6
Lab	40.0	30.4	35.6	35.0	45.8
LibDem	7.4	7.9	13.8	8.3	18.5
C/(C+L)	51	54.8	52	-	-
(C+L)/(C+L+LD)	92	89.4	-	80	91
(C+L+LD)	90	75.2	[98]	-	-

[23] Burt, 2017, op. cit., 254-265.

We now consider the hierarchy of competition between the parties. Looking at the core two-party competition, the Conservative share in 2017, as in 2015, is near the AR equilibrium. Looking at the third-party competition with the Liberals, the Conservative and Labour share in 2017, as in 2015, is near the higher equilibrium in the binary model. Looking at the insider-outsider competition, the three-Westminster-party share in 2017 has bounced back from its exceptionally low level of 2015, consistent with a more gradual decline in the Westminster share – this relates to the sharp rise and fall of the UKIP vote.

Links

The approach in this chapter is – not surprisingly - close to the analysis of the UK general election of 2015 which was presented in the 2015 Yearbook (Chapters 9 to 12).

More generally there are links to several chapters on politics in previous books. The overviews of these chapters have been brought together in a 13-page document entitled *Politics: Values, Society and Modelling*,[24] the chapter titles being:

Yearbook 2014
9 Ukraine: United or Divided? West and East; Living with Others
10 Scotland: 'Our Values'? Independence? More Varied and Less Distinctive

Yearbook 2015
8 Nigeria, Greece and Ireland: geography and one-dimensional political space
9 Northern Ireland: multidimensional political space and geography
10 The UK general election, 2015: prelude and outcome
11 Democracy: satisfaction? … dissatisfaction? … value space
12 Time series: UK general elections - 1945 to 2015
13 Sets and functions; time and space
14 Value spaces; the Earth in space and time

Yearbook 2016 (in preparation)
7 The UK Brexit referendum: voters in social space
8 USA Presidential Elections, 1789-2016

[24] Burt, Gordon. *Politics: Values, Society and Modelling*. 2017. Accessed January 14, 2018. https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxnb3Jkb25idXJ0bWF0aHNvY3NjaXxneDpmMjM0NTQ4ZjI2OGNmN2E.

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