Going Back to the Beginning:

Changing Biases in the British Electoral System

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Introduction

In common with many previous general elections in the UK the 2015 result highlights the propensity of the first past the post voting system to result in disproportional outcomes in terms of inequalities in the vote to seat ratios for competing parties. On this occasion the Conservative party benefitted most, winning 330 (51%) of the seats despite receiving just 37% of the UK-wide vote. Another known feature of the voting system is that it tends also to favour the second-placed party, although some recent elections in the UK breach that rule of thumb. Indeed, the 2015 election did over-represent the Labour party. It won 36% of the Commons' seats with 30% of the national vote.

Combined, the two largest parties, therefore, received 67.2% of the votes cast but 86.5% of the seats. How then, should we assess the outcome in terms of the overall party system? Measuring and calibrating the number of parties in a given party system is clearly a very important research area for political scientists and effort has been expended in deriving indexes in order to achieve this. One method, still extensively used, was first developed by Markku Laasko and Rein Taagepera (1979) and developed further by Shugart and Taagepera (1989) considers the degree of fractionalisation of the party system, most often stated in terms of the effective number of parties. This value may be expressed as either Nv (where N represents the number of measured parties and v is vote) or Ns (where s assesses the distribution of parliamentary seats rather than votes). The value of Nv for the 2015 general election is 3.9 while Ns is 2.5.

As with most indexes, Nv/Ns have attracted critics and alternative measures (see, for example, Molinar 1991; Dunleavy & Boucek 2003; Golosov 2009). In addition, there has been discussion about the appropriate 'level' for employing these measures (Gaines 1997) – should we assess the number of parties in terms of the national situation or instead of the competitiveness at the constituency level? The intense scrutiny given to the measurement of party systems even led one of the co-inventors to review and reassess its value (Taagepera 2007) and to put forward alternative metrics (Gaines & Taagepera 2013). But it seems that consensus on the most appropriate measurement of a party system is still a long way off (Dunleavy 2014; Gaines & Taagepera 2014).

Continuing uncertainty about the most appropriate way of counting the number of parties indirectly affects other research whose principal focus happens to lie elsewhere. Having noted some features of the disproportional outcome of the 2015 general election it is also pertinent to ask whether in addition to disproportionality there is also evidence of electoral bias. Electoral bias results from certain properties or characteristics of the voting system that contribute towards an asymmetrical distribution of seats between parties enjoying roughly comparable vote shares. In the context of the 2015 election, would the distribution of seats have been different had Labour, and not the Conservatives, captured 37% of the national vote? If the consequence of reversing the vote shares in this way is that Labour would have emerged with a modest overall majority then we can assume there is no electoral bias. If the outcome had been something different to that, say Labour had

fallen short of an overall majority, then it is safe to assume some measure of bias is present although its cause is yet to be determined.

A way of constructing a method for measuring or decomposing electoral bias was first proposed and developed by Ralph Brookes (Brookes 1959; 1960). Brookes' method identifies various features of the voting system as they impact upon the translation of votes into seats for different parties and assembles these together to measure the extent of electoral bias. Brookes' papers develop a method for understanding bias in a two-party system. This basic method (slightly modified to accommodate third-party victories) was subsequently used to assess bias within the UK system (Johnston, Rossiter and Pattie 1999; Johnston, Pattie, Dorling and Rossiter 2001; Johnston, Rossiter, Pattie and Dorling 2002). However, the evolution of the Liberal Democrats as a significant parliamentary party from the 1997 election onwards led to a belief that a major overhaul of the Brookes method was required (Borisyuk, Johnston, Thrasher and Rallings 2008; 2010) if a three rather than a two-party system prevailed. The three-party bias method was subsequently used to analyse the outcome of the 2010 general election (Thrasher, Borisyuk, Rallings and Johnston 2010) and later to reconsider elections from 1983 onwards (Johnston, Borisyuk, Thrasher and Rallings 2012).

Having adapted the original method, however, are we any clearer about when to use the two-party or three-party variants? Just as there is disagreement about how we should measure the party system – in terms of vote or seat share distribution and at the national, constituency or some intermediate level of geography – so we might debate about how we measure electoral bias. A recent paper that addressed the activities of parties to influence the activities of the boundary commission reviews of parliamentary boundaries (subsequently aborted prior to the last election) (Johnston, Pattie and Rossiter 2013) first employed the two-party method to examine the competition between the Conservative and Labour parties and then the three-party approach as it became clearer that the Liberal Democrats had been more actively involved than previous boundary reviews in trying to shape the new boundaries.

This analysis of electoral bias at the 2015 general election takes a similar approach, reporting the bias components for the two and three-party situations but for rather different reasons that are explained fully in the following section. Suffice to say at this juncture, the 2015 result, whilst confirming the dominance of the two main parties in terms of the seat distribution (their combined share is the same at the 2010 general election) also brings a radical re-shaping of vote distributions, nationally, regionally and at the constituency levels. Subsequent sections examine bias from a number of different perspectives, beginning with two-party bias, then into three-party bias using the standard three parties (Conservative, Labour and Liberal Democrat) before concluding with variants that consider either a different three-party configuration (Conservative, Labour and Ukip) or separate analyses that acknowledge the election fought in Scotland was dissimilar to the one experienced in England and Wales.

The 2015 result

The Conservative party achieved a notable success at the 2015 general election by increasing its national vote share and winning an overall majority (Table 1). Thus, David Cameron became the first Prime Minister in a century to serve a full term in office and then proceed to win more votes and seats than at the previous election. A key factor in this victory were major seats gains from the Liberal Democrats but the Conservative cause was also assisted by wins from Labour – constituencies which the Conservative party had failed to capture in the more favourable conditions of the 2010 election. Although the Labour party too increased national vote share its seat numbers declined because the net gains made from the Conservatives and Liberal Democrats combined were more than cancelled out by a 40-seat loss to the Scottish National Party (SNP).

Table 1: Votes and Seats at the 2015 election (Northern Ireland excluded)

	Votes	Votes% (GB)	Change +/-	Seats (GB)	Change +/-	Votes % (UK)	Seats (UK)
Con	11,290,554	37.7	+0.8	330	+24	36.8	330
Lab	9,347,003	31.2	+1.5	232	-26	30.4	232
LD	2,415,916	8.1	-15.5	8	-49	7.9	8
Ukip	3,862,775	12.9	+9.7	1	+1	12.6	1
SNP	1,454,436	4.9	+3.2	56	+50	4.7	56
Green	1,150,808	3.8	+2.9	1	-	3.8	1
PC	181,704	0.6	+0.0	3	-	0.6	3
Others	275,956	0.9	-2.6	1	-	3.1	19
Total	*29,979,152*			*632*			*650*

The SNP and Liberal Democrats experienced sharply contrasting fortunes which has profound consequences for the United Kingdom's party system. The SNP, which of course only contests parliamentary seats in Scotland, secured an absolute majority of votes cast there, becoming the first party to achieve that feat since the Conservative party did so at the 1955 election. This dominance of the popular vote meant it won 56 of the 59 seats available, having secured only six at the previous election. By contrast, the Liberal Democrats, having increased vote share in five successive general elections from 1992 onwards, slumped to single figure returns in both vote share and seats.

Overall, a total of 111 seats changed hands at the 2015 general election, the third largest turnover since 1950.   And yet, the changes in *national* vote share were rather modest with regard to the two largest parties. Rather, it was below this level, among the smaller parties, where the largest fluctuations in support occurred. In terms of the two dominant parties, Conservative and Labour, the conventional Butler swing, which measures relative movement across elections between the two largest parties, is just 0.4 per cent from Conservative to Labour; the lowest swing at any general

election since the Second World War. Once again, the UK's first past the post voting system shows its capacity to bring about fundamental changes in the distribution of seats in the House of Commons for what may be regarded as relatively modest shifts in national electoral opinion.

A measure of the dramatic changes at the constituency level is captured in Table 2. The first column shows the winning party with each row identifying the party that finished in the runner-up position on this occasion. It is this distribution of winners and their nearest rivals that has an important bearing upon the overall distribution of bias. In 2015, Labour came second in 207 constituencies that returned a Conservative MP – 63 per cent of the Conserative tally (in 2010 it finished as runner-up in just 137 of the 306 Conservative seats or 44.8 per cent). Conservative candidates finished as runners up in 168 of Labour's seats, or 72 per cent of the total won by Labour (147 of 258 seats/57 per cent in 2010). In many parts of the country, therefore, the 2015 election marked the return of a more clearly defined two-party battle where the balance of winners/second place clearly favours the Conservatives (Johnston and Pattie 2011).

Table 2. The distribution of first and second places at the 2015 general election.

Winning party	Party in second place								Total 1st
	Con	*Lab*	*LD*	*Ukip*	*Green*	*PC*	*SNP*	*Ind/Oth*	
Con		207	46	75			1	1	*330*
Lab	168		9	44	4	5	1	1	*232*
LD	4	2				1	1		*8*
Ukip	1								*1*
Green		1							*1*
PC	1	2							*3*
SNP	7	41	8						*56*
Total 2nd	*181*	*253*	*63*	*120*	*4*	*6*	*3*		*631*

Note: Total sums to 631 because the Speaker's seat of Buckingham is excluded and also the 18 seats in Northern Ireland.

The Liberal Democrats not only lost 49 of their 57 seats, but finished in second place in just 63 (by contrast it had 243 second-place finishes in 2010). An indication of the party's declining support is that its candidate finished in fourth place in 338 constituencies while 341 of them lost their deposits by attracting less than five per cent of the constituency votes. If the 2015 election is examined in isolation then the Liberal Democrats' status as 'third party' is clearly in dispute. By contrast, Ukip may only have won a single seat, but finished in second place in 120 constituencies -44 of them Labour-held; in 2010 the party only came second in a single constituency, Buckingham, the Speaker's seat which by convention in not contested by the main parties. Scotland, of course, represents a special case of its own not only because the SNP won so many of its seats but also because Labour finished second in 73 per cent of them. Taken together these figures show that the competition for

votes and distribution of seats following the 2015 election are substantially different than at the previous election and explains why we should consider bias from a number of separate perspectives.

The decomposition of electoral bias

As stated earlier, electoral bias is present when parties that perform similarly (in terms of vote share) are affected by the voting system in dissimilar ways in terms of the subsequent seat distributions. Brookes contended that the factors that contributed towards 'distorted representation' (his term) could be identified and calibrated. There are four main factors involved. These are vote distribution (or 'geography') for each party in those constituencies where it stands candidates, the size of each constituency's electorate ('malapportionment' better captures inequalities in electorate size and how these impact the result), relative constituency-level electoral turnout (although Brookes' preferred 'abstention') and finally, the impact of minor parties upon the main parties (for example, if the two-party method is used this means in effect the votes cast for other parties). Additionally, the method considers net interaction effects between these various components. Later, another component, third party victories was added by Roger Mortimore (see Johnston et al. 1999). The size of the various bias components are shown as either positive or negative integers – a party that benefits by winning many of its seats in low turnout constituencies, for example, would have a positive bias from this effect. The nature and direction of overall bias in the system following an election is shown by the sum of the positive and negative bias measures for each party.

Brookes operationalised bias decomposition by posing two counterfactuals. The first states that instead of party A receiving the most votes and seats with party B finishing second what would have been the electoral outcome if the vote shares of these parties were reversed? An alternative approach assumes instead an equal shares position whereby the gap in vote share between the two parties is halved, effectively making the election result a dead-heat. In both cases, reverse and equal shares, the calculation of the imagined seat distribution is achieved simply by applying a uniform swing across all constituencies and then counting how many seats are won by each party under these revised conditions. Developing the three-party bias method led us to conclude that the reverse shares procedure worked best after first recalculating the votes for Conservative, Labour and Liberal Democrat candidates into three-party shares. This entails comparing the actual election outcome (in terms of vote and seat distributions) with the set of all possible combinations of the three party vote shares. In effect, this means substituting Butler swing with Steed swing (Borisyuk et al. 2010). Accordingly, the analysis of two-party bias below uses the reverse shares procedure (after re-calculating the two-party share Labour is awarded the Conservative share and vice versa) and then Steed swing is uniformly applied to each constituency. Furthermore, because the three-party method necessarily examines positive and negative bias across three parties we use the largest party as our reference party (positive bias indicates a bias towards that party) but for two-party bias the practice has been to show a bias towards Labour as positive, that towards the Conservatives as negative (Johnston, Pattie, Dorling and Rossiter 2002). Here, to facilitate comparison across the two and three-party variants we instead show bias components that favour Labour as negative values.

Back to the Future: Two-Party Bias

Table 3 shows the decomposition of two-party bias at the 2015 general election and for comparison the 2010 and 2005 elections (GB figures and negative values indicate a bias towards Labour). The final three columns de-compose two-party bias in 2015 across three separate geographies, England, England and Wales and finally Scotland where the two parties are SNP and Labour.

Across Britain there is a total bias of 26 seats favouring the Conservatives following the 2015 election. The positive components of this bias are minor party wins, the geography or vote distribution component and a rather smaller contribution derived from minor party votes. By contrast, Labour's position is assisted by differences in electorate size (both national and within-country where it was clearly helped by the failure to implement a national electoral quota that would have reduced the proportion of seats in Scotland and Wales relative to England) and the abstention component. There are some sharp differences with the two previous election, not least the reversal of total bias which had been worth 54 seats to Labour five years before and a 100-seat advantage in 2005. Much of this turnaround can be attributed to the improved vote distribution of the Conservative party relative to Labour – from a 25 seat disadvantage in 2005 to a 30 seat advantage now. Another significant contributory factor is the minor party wins component. Whereas Labour enjoyed a 20+ seat advantage between 2005-2010, the picture is reversed in 2015 where the Conservatives receive a 35 seat lead on this component alone.

Table 3: Decomposition of two-party electoral bias at the 2015 general election

Component	2005	2010	2015	England	Eng & Wales	Scotland (SNP/Lab)
Geography	-25	+1	+30	+46	+43	+5
Electorate size	-27	-18	-16	-11	-15	-0
national difference	-3	-9	-6	+0	-5	0
within-country	-24	-9	-9	-11	-10	-0
Abstention	-38	-30	-24	-25	-26	-0
Minor party votes	+15	+18	+7	+17	+16	+2
Minor party wins	-22	-23	+35	-1	-1	+5
Net Interaction	-3	-0	-6	+3	+2	+1
Total Bias	-100	-54	+26	+30	+19	+12

For ease of comparison across all three elections a pro-Labour bias is shown as a negative value and pro-Conservative bias is positive. In the final column the positive values show bias towards the SNP.

Looking at bias in the separate geographies confirms the general pattern of bias favouring the largest party (Conservatives in England and Wales; SNP in Scotland). The overall bias in English constituencies is close to the value for Britain as a whole and possibly reflects England's seat dominance (533 seats out of a total of 632 seats in Britain). However, when the 40 Welsh constituencies are included Labour's position improves and the Conservative advantage reduces to 19 seats. Finally, the analysis of two-party bias in Scotland necessarily substitutes the SNP for the Conservatives in assessing two-party bias. Relative to Labour the SNP has an advantage that is worth 12 seats with almost half deriving from a vote distribution bias (Labour's wasted voted in seats where it came second) and the same level of bias deriving from minor party wins.

There are, however, some aspects of using the two-party method that raise some issues. First, there is the relative size and contribution to overall bias of the minor party win component. In the case of the 2015 election this contributes a sizeable pro-Conservative bias that is explained by Labour's poor showing in Scotland (compare this component in the columns for England and England and Wales). Recall, that this particular component was a later addition to the original Brookes' method as a way of accommodating the growth of the third party. It might be that the size of this component is distorting the impact of other components when the two-party method is used.

A second concern that arises from this analysis is whether it makes sense to divide Britain into different geographies. In 2015 the Scottish constituency results clearly followed a different pattern to those in England and Wales but does that legitimise dividing the analysis on that basis. Previous general elections have shown different sub-national patterns without that affecting the manner of analysis electoral bias. Should the situation in Scotland be regarded as a special case, and if so, how should it be analysed within the broader context.

It is possible, therefore, that the decomposition of electoral bias in 2015 is more easily understood utilising the three-party method and we now turn to this, initially designating the three parties as Conservative, Labour and Liberal Democrats.

The Conservative/Labour/Liberal Democrat contest

Decomposition of three-party bias for the 2015 general election reveals that while the two main parties benefitted Labour's relative advantage over the Conservatives is drastically reduced from what it had been following the 2010 result (Table 4). The disadvantage suffered by the Liberal Democrats was much smaller than it had been in 2010 but this is largely because the party attracted far fewer votes in 2015 and therefore its failure to capture many seats is less about electoral bias and more about small parties in a plurality system. Overall, for the defeated Liberal Democrats there is much less bias in the 2015 result - 19 seats compared to 76 seats in 2010. Indeed, taking the eight general elections between 1983-2015, the overall level of bias in 2015 is smaller than all others with the exception of the 1997 election (Johnston et al. 2012).

Table 4: Decomposition of electoral bias, 2015 and 2010 general elections

	Conservative		Labour		LD	
Component	*2015*	*2010*	*2015*	*2010*	*2015*	*2010*
Geography	+28	+36	-10	+31	-20	-74
Electorate	-8	-7	+7	+6	+3	+1
Abstention	-12	-11	+16	+13	-4	-6
Minor party	+1	-2	-2	+2	+1	-1
Net interactions	-5	-3	+0	+11	+1	+4
Total bias	+6	+13	+12	+63	-19	-76

This initial analysis also suggests that the three-party rather than the two-party decomposition method might be more appropriate. The size of the minor party component (this method does not consider minor party wins) is relatively small contrary to its impact in the two-party approach above. Furthermore, the relative contributions made by the malapportionment and abstention bias components are smaller here than before. Below, we examine the bias components in rather more detail.

Geography

The overall pro-Labour bias amounts to about 12 seats, double the six seat bias that favoured the Conservatives but the most interesting feature is that while the Conservative bias halved in size there was a five-fold decrease for Labour. The largest single element in this reduction is the geography associated with Labour's vote distribution, which had given the party a 31 seat advantage in 2010 but now a deficit of ten seats. The geography component also largely explains the small drop in overall bias favouring the Conservative party – a 36 seat advantage from 2010 reduces to 28

seats but interestingly this gives the Conservatives a considerable edge in the efficiency of its vote distribution over Labour, a reverse of the pattern seen in both the 2001 and 2005 elections. Indeed, almost half of the benefits accruing to the Conservatives from the geography component are derived from Labour. Since the relative efficiency of each party's vote distribution is playing such an important role in explaining the turnaround in electoral fortunes it is worth examining this in rather more detail.

The most efficient method for a party to adopt under first past the post rules is to achieve its victories without accumulating large majorities, or wasted votes, if we assume that gathering votes costs resources. Similarly, there is little point in wasting resources attracting support if it is less than that required to win seats – these are 'wasted votes'. Parties should win by small majorities and lose by many votes if the desire is to have an effective vote distribution. Parties that ignore these maxims simply accumulate surplus or wasted votes, or more simply, ineffective votes.

Table 5: The changing distribution of ineffective votes 2005-2015

		Seats won	(a) Votes per seat won	(b) Ineffective votes per seat won	% (b) of (a)	(c) Total Surplus votes	(d) Total Wasted votes	Total Ineffective votes (sum of (c) and (d))	Total votes
Con	2005	210	41,820	27,872	66.6	1,651,370	4,201,719	5,853,089	8,782,197
	2010	306	34,979	20,596	58.9	2,898,033	3,404,308	6,302,341	10,703,720
	2015	330	34,214	21,845	63.8	4,275,307	2,933,385	7,208,692	11,290,554
Lab	2005	348	27,450	16,518	60.2	2,776,533	2,971,894	5,748,427	9,552,436
	2010	258	33,359	21,886	65.6	2,041,068	3,605,596	5,646,664	8,606,525
	2015	232	40,289	29,211	72.5	2,443,509	4,333,477	6,776,986	9,347,003
Lib Dem	2005	62	96,540	81,816	84.7	321,967	4,750,631	5,072,598	5,985,454
	2010	57	119,942	103,913	86.6	318,040	5,604,975	5,923,015	6,836,718
	2015	8	302,012	288,945	95.7	31,192	2,280,364	2,311,556	2,416,096

Table 5 collates 'ineffective' votes for the Conservative, Labour and Liberal Democrat parties and compares the distribution of these across the last three general elections. It is clearly beneficial for a party to win seats with fewer votes than its rivals. In this respect the trend for the Conservative party is in the right direction which had an average of 41,280 votes per seat won in 2005 compared with just 34,214 votes in 2015. Note, however, that in terms of votes per seats won the Conservatives performed about the same as they had done in 2010 but succeeded in winning an additional 24 seats. By contrast, its two rivals have moved in the opposite direction with Labour now at about forty thousand votes per seat won. The Liberal Democrat position now assumes the characteristics associated with a classic small third party trying unsuccessfully to operate within the confines of an unfavourable voting system.

The key to understanding why the Conservatives were able to improve their position so well lies in comparing ineffective votes (wasted and surplus) as a percentage of the votes per seats won. The smaller the percentage, the more efficient the vote distribution. In 2015 this percentage is just 63.8 per cent for the Conservatives, actually a small increase on the 2010 result. For Labour, however, this percentage has been rising, up from 60.2 per cent in 2005 to 72.5 per cent at the recent election meaning that 6.8 million of Labour's total 9.3 million votes may be regarded as ineffective. For the Liberal Democrats, once celebrated for its capacity to target votes into winnable constituencies the 2015 election signals a clear failure to continue that tactic with the consequence that 95.7 per cent of the party's support (2.3 out of 2.4 million votes) was ineffective. Given the poor distribution of its main rivals' vote it is unsurprising that the Conservatives were able to increase its tally of seats so well.

Figure 1a-c perhaps provides a clearer explanation for the Conservative advantage over Labour and Liberal Democrats stemming from the relative distributions of surplus and wasted votes respectively. Surplus votes are shown above the zero line and wasted voted below it. The efficiency of each party's vote distribution can be measured by how close its votes are positioned adjacent to the zero line.
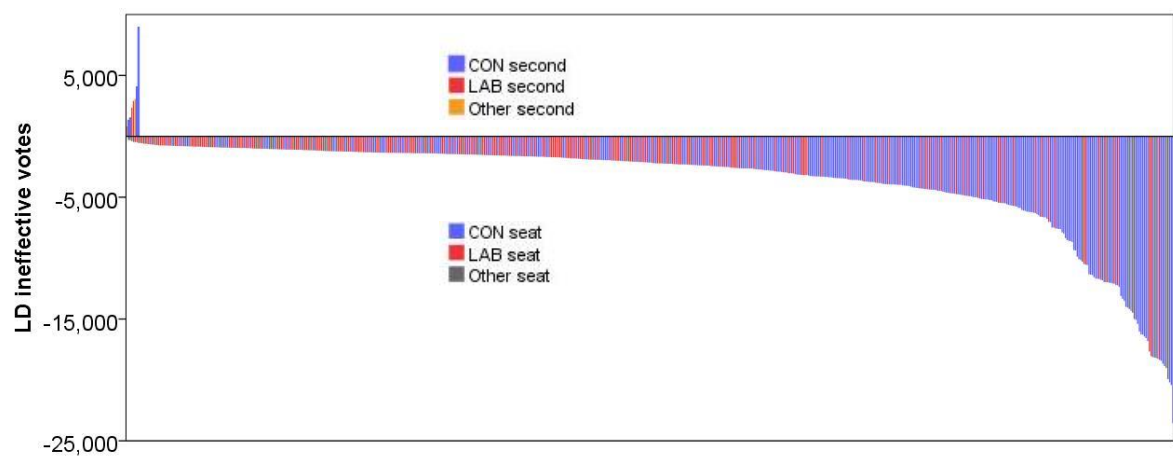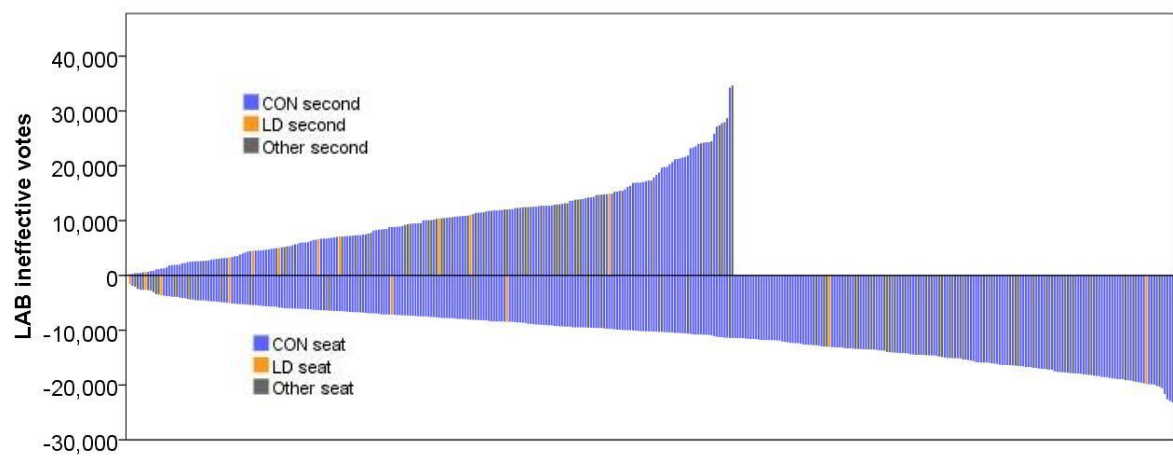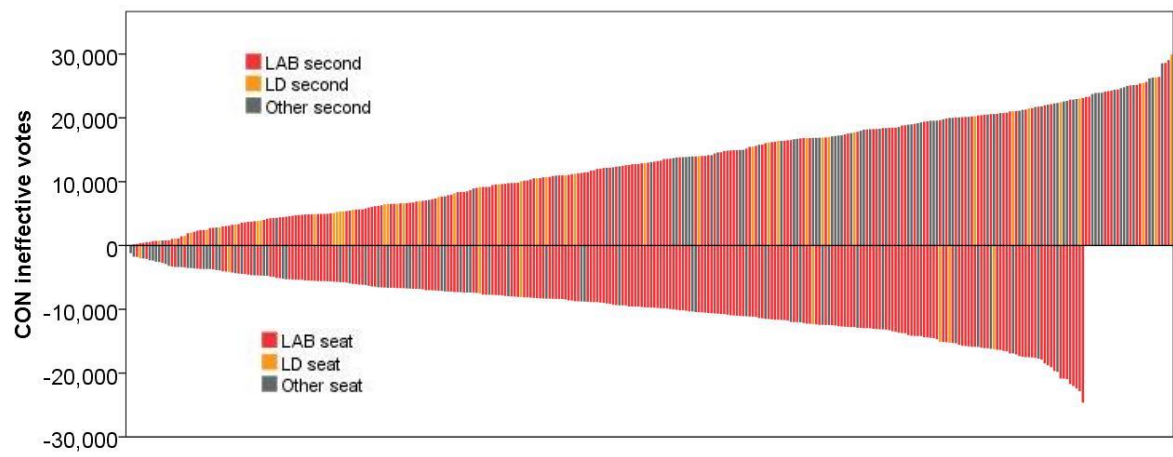
Figure 1a describes the accumulation of surplus votes in the 330 seats won by Conservative candidates and wasted votes in 301 constituencies where its candidate stood but lost.

The number of surplus votes (above the zero line) are ranked in order from smallest to largest. Each bar represents a constituency and the bar's colour indicates the party coming second. Reading across from the vertical axis shows that in 124 of the Conservative seats (i.e. 38%) the winner's majority is under 10,000 while in only 69 cases (21%) does the majority rise above 20,000. Wasted votes that went to losing Conservative candidates are shown below the zero line with each bar's colour indicating the party of victory. A large number of these bars are grey, and identify victories by the SNP where Conservative candidates attracted very few 'wasted' votes. There are 130 constituencies (43 per cent of the 301 seats where Conservative candidates were not elected), however, where losing Conservative candidates attracted 10,000 or more wasted votes.

Regarding the separate geographies of the Conservative and Labour parties some interesting differences emerge. Among the 330 constituencies won by the Conservatives only a third (37.6 per cent) were won by fewer than ten thousand votes. A fifth of Conservative wins also came with more than 20,000 surplus votes. By contrast, in terms of its winning seats, Labour's vote was distributed much more effectively. Among the 232 Labour victories almost half (48.7 per cent) were won with majorities of under ten thousand votes. In just over ten per cent of its winning seats did the victor's majority exceed 20,000 votes. Labour clearly had the edge over the Conservatives in the matter of 'surplus votes'. Regarding 'wasted votes', however, the positions reverse with the Conservatives
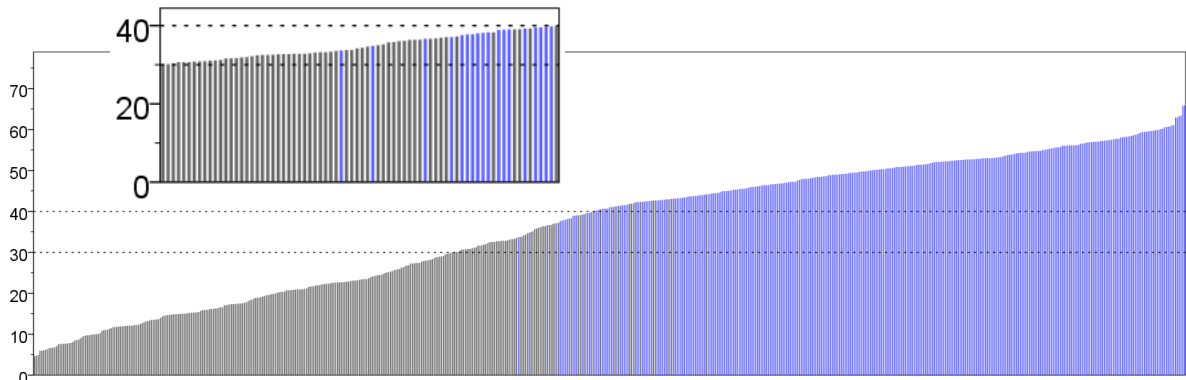
now enjoying the better vote distribution. For example, in 83 per cent of the 301 seats not won by a Conservative candidate the party attracted the support of fewer than fifteen thousand voters. For Labour the corresponding percentage is much lower, 64.9 per cent. In short, while Labour is better than the Conservatives at observing the maxim, 'win small' the positions are reversed in terms of the maxim 'lose big', especially in Scotland where Conservative candidates attracted very little support.

Given that the Liberal Democrats were reduced to just 8 seats it seems more appropriate to ignore the matter of surplus votes (only in Tim Farron's seat of Westmorland and Lonsdale is there a significant number) and focus instead on the large number of wasted votes that contributed towards the party's poor vote distribution. In the 623 constituencies where Liberal Democrat candidate lost, in 57 per cent the party attracted more than 10,000 votes but there are 186 (30%) constituencies where wasted votes were in excess of 15,000. It is unsurprising, therefore, that the geography component more or less accounts for the whole of the party's negative bias
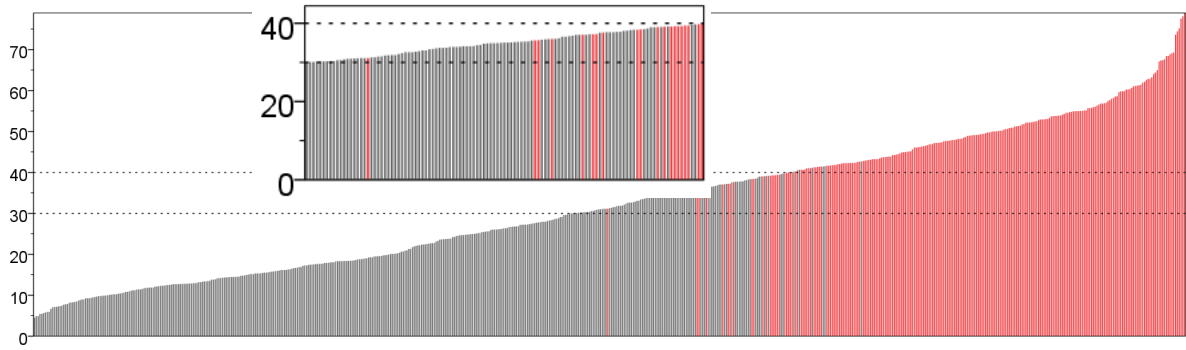
While Figures 1a-c reveal the composition of each party's ineffective votes Figures 2a-c demonstrate the capacity for victory. A crucial feature of the 2010 election outcome was Labour's superior ability relative to its main rival when converting vote share into victories. Remarkably, at that election it captured 57 out of 148 seats (a 38.5 per cent level of success) where it polled between 30-40 per cent of the constituency vote. By contrast only 26 per cent of Conservative candidates in those circumstances went on to win and just 12 per cent of Liberal Democrats.
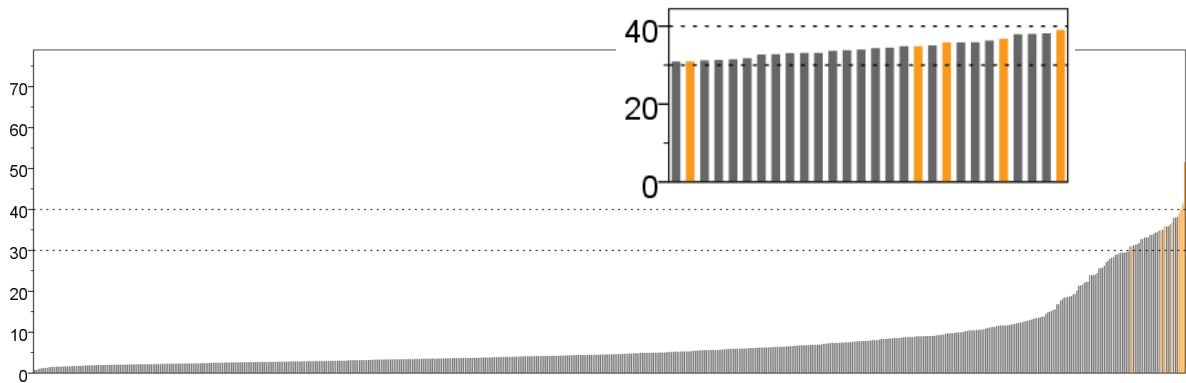
It is clear that in 2015 Labour lost that significant advantage, winning 20 of the 117 seats in the 30-40 per cent range (although it did win the Welsh constituency of Ynys Mon with just 31 per cent of the vote!). The Conservatives fared better than Labour in converting votes to seats although slightly less well than was the case five years before. It is perhaps scant consolation for the Liberal Democrats that its success rate in 2015 is better than it had been in 2010.

30-40% range: CON won 18 of 76 seats (23.7% success)

30-40% range: LAB won 20 of 117 seats (17.1% success)

30-40% range: LD won 5 of 28 seats (17.9% success)

Malapportionment

Table 4 reveals that the Conservatives suffer from bias that stems from unequal electorates (a negative bias of eight seats) which they would have expected largely to disappear following completion of the sixth boundary review. But this picture should be set in the wider context of how the party has been adversely affected by malapportionment since 1983. The negative bias following boundary changes implemented for the 1983, 1997 and 2010 elections (-9, -10 and -7 respectively) is of similar magnitude to the -8 seats in 2015 although it should be said that some of this malapportionment is in-built into the system because over the over-representation of Wales and to a lesser extent Scotland.

Meanwhile, Labour benefitted from the electorate bias component, advantaged by seven seats because the party tends to win in urban areas which have seen registered voter numbers falling relative to other types of constituencies. But once again, the relative impact of this advantage is far smaller than it was in 1992, for example, when the 1983 boundaries were being employed for the third successive election and gave Labour a positive electorate bias of 18 seats and helped to explain why John Major's parliamentary majority was smaller than a seven point lead in the popular vote might have warranted.

Table 6: Electorate measures for 2015 general election

Winner 2015	N seats	2015 electorate			
		Min	Max	Mean	Std dev
Conservative	330	45,525	108,804	73,324	6,775
Labour	232	49,821	91,987	69,514	8,152
Liberal Democrat	8	34,552	72,351	61,894	12,391
Other (incl Speaker)	62	21,769	86,955	69,262	10,797

Table 6 provides details of electorates in seats won by the three parties and shows the mean electorate to be highest in Conservative-won seats and lowest across the eight constituencies won by a Liberal Democrat. The maximum electorate 108,804, for the Conservatives is the Isle of Wight constituency which would have divided into two separate constituencies had the boundary changes, each with electorates much smaller than the national quota. A second point worthy of note is that the low mean electorate bias figure for the Liberal Democrats is affected by the inclusion of the Orkney and Shetland seat, another constituency regarded as a special case by the boundary review process. Recalculating the Liberal Democrat figures without this constituency brings the mean electorate up to nearer seventy thousand electors. The party's modest three seat advantage from

the electorate bias component would have become even smaller had it lost the Orkney and Shetland seat.

Abstention

The abstention bias component traditionally favours Labour because its MPs are more likely to be chosen by low turnout constituencies. In 2015, when turnout across Britain (66.3 per cent) showed only a marginal increase on the previous election, Labour's advantage rose from 13 to 16 seats. This matched the level following the 2005 election and just short of the 18 seat advantage produced by the record low turnout found at the 2001 election. Conversely, the relatively high turnout among Conservative-won seats and especially in the strong competition encountered in Liberal Democrat – held constituencies, meant that abstention bias was negative for both – 12 seats for the former and 4 seats in the latter case. The last four general elections have seen the abstention component disadvantage the Conservatives in the range of 11-14 seats.

Table 7: General election turnout in 2015 by winning party

Winner 2015		Seats	Min	Max	Mean	Std dev
Conservative	Turnout	330	57.0	77.3	68.7	3.4
	Change10/15		-8.7	17.7	0.4	2.1
Labour	Turnout	232	51.3	75.6	61.9	4.6
	Change10/15		-6.3	10.4	0.7	2.5
Liberal Democrat	Turnout	8	65.5	76.7	70.1	3.9
	Change10/15		-2.6	7.3	1.7	3.5
Other (incl Speaker)	Turnout	62	55.4	81.9	70.6	5.1
	Change10/15		-1.9	11.8	6.8	2.7

Table 7 provides the percentage turnout in seats won by the different parties. Despite the closeness of the electoral competition, with most of the published opinion polling evidence pointed to another hung parliament, the proportion of those not voting fell only slightly. The mean turnout in Conservative seats was eight points higher than in Labour seats. It is clear that there are some local effects affecting turnout in individual constituencies. In Cambridgeshire North East, for example, the number of electors abstaining in this Conservative seat increased from the previous election while in Thirsk & Malton (where the 2010 election was postponed because of the death of a candidate) there was a 17.7 point rise. There was more variation in turnout in seats returning Labour MPs. The minimum turnout was in Stoke on Trent Central (51.3 per cent; 48.7 per cent abstaining) while 75.6 per cent participated in the Wirral West constituency where the Conservative Employment minister, Esther McVey was defeated.

A new three-party system?

There is, of course, the possibility that while the three-party method is the most appropriate instrument for measuring bias in 2015 the wrong parties are specified. In the next stage of the analysis, therefore, we retain the Conservative and Labour parties but substitute Ukip in place of the Liberal Democrats. Although only one Ukip candidate was successful, Douglas Carswell winning the Clacton seat, the party's overall national vote share places it in a clear third place.

The procedure for de-composing the bias for this configuration of three parties works in the same way as before but now examines the combined Conservative, Labour and Ukip vote shares. Table 8 shows that Labour becomes the clear beneficiary when Ukip is included with a net positive bias in its favour of 38 seats. The Conservatives are neither advantaged or disadvantaged from bias but there is a clear negative bias of 28 seats for Ukip. Virtually all of this stems from Ukip's poor vote distribution which assists mostly Labour but the Conservatives also. Ukip clearly failed to target its support; the mean vote share for Ukip candidates was 13.3 per cent, close to the level it achieved in the national vote. The average vote share rose to only 19 per cent in the 120 constituencies where its candidate finished second. Of course, this performance is still a considerable one in terms of the party's past record but it reveals a party that has broad rather than a strategically located appeal to voters. Labour's advantage is consolidated by electorate and abstention bias.

Table 8: Decomposition of three-party electoral bias with the inclusion of Ukip as 'third' party

	Con	Lab	Ukip
Geography	15	23	-28
Electorate	-8	7	2
Abstention	-13	12	0
Minor party	6	-3	-2
Net interactions	0	0	0
Total bias	0	38	-28

An obvious consequence of choosing Ukip as the third party is that the sum of the bias components do not sum to zero. This is largely because of the eight seats won by the Liberal Democrats and in a sense highlights why the inclusion of Ukip as the third party solely because of its vote share is perhaps inadvisable. Another consequence is that Labour's advantage relative to the Conservatives is much larger than before – 38 rather than 6 seats and this needs further investigation.

Electoral bias across different geographies

Having considered different geographies for the two-party method it is logical also to consider it for the three-party method also. Certainly, the SNP is the third largest party in the new Parliament but,

of course, its national vote share is less than half that of Ukip since it only stood candidates in the 59 Scottish constituencies. Clearly, it makes little sense to regard the SNP as a national party and instead consider Scotland separately in terms of the bias components and select the three largest parties in order of vote share, SNP, Labour and Conservative. At the same time it is appropriate to examine how bias is distributed across England and Wales in order to assess better the impact of removing Scotland from the national picture (Table 9).

Table 9: Comparing three-party electoral bias in Scotland with England & Wales

	Scotland			England & Wales		
	SNP	Lab	Con	Con	Lab	LD
Geography	3	-1	0	16	5	-20
Electorate	0	0	0	-8	5	2
Abstention	0	0	0	-12	14	-4
Minor party	1	0	0	2	-2	0
Net interactions	1	0	1	-3	3	3
Total bias	*4*	*-1*	*1*	*-4*	*+27*	*-19*

As it happens, Scotland provides an excellent example of how disproportionality differs from electoral bias. The SNP captured half the votes cast and won 95% of the seats, a clearer case of the 'winner's bonus' under FPTP one is likely to find. However, decomposing the bias suggests that there is little bias in the Scottish outcome with the SNP in receipt of a four seat bias (after rounding). This is unsurprising since if Labour (or any party for that matter) had won half the votes it too would have been richly rewarded in terms of winning seats.

Removing the Scotland results has quite a dramatic impact on the level of positive bias in Labour's favour. Instead of a negative bias from the geography component Labour now has an advantage of five seats. The simple explanation for this is that Labour was disadvantaged by its accumulation of wasted votes in the Scottish seats it lost to the SNP. The remaining bias measures in respect of Labour are largely unchanged and so this approach puts into perspective just how damaging the Scottish outcome was to the party's overall position. From the Conservatives' perspective decomposing bias across just England and Wales takes them from beneficiaries of net bias and instead a negative bias of four seats.

Again, it is the geography component that is key to understanding this change with the Conservatives moving from an advantage of 28 seats down to one of just 16 when only the voting across England and Wales is considered. This is largely because by removing the Scottish constituencies we also remove an important feature of the Conservative vote distribution, namely its success in not gathering waster votes in seats where it has no chance of winning. There are 34

constituencies where the Conservative share is 10% or lower and 25 of those (74 per cent) are in Scotland.

Conclusions

There is no doubting the remarkable outcome of the 2015 election. The Conservative party secured an overall majority despite a small national swing against. Although Labour was better supported it experienced one of its worst ever elections. The Liberal Democrats, in recent decades the acknowledged 'third party' of British politics was deposed from that status by the SNP in seats and by Ukip in votes. This raises some important questions about how we should assess the new party system that emerges and importantly from our perspective how we should go about identifying and decomposing electoral bias evident in the 2015 result.

Our approach has been to use the two available methods, first considering the system as two-party with third party others and second to review it as essentially a three party system. Within these approaches we have also sought to investigate how the rather different outcome in Scotland is best explored and whether anything is achieved by dividing whole election outcomes into discrete parts in order to accommodate different patterns of party competitiveness.

A major point of agreement in the results is that the trend over the period 1992-2010 favouring Labour over the Conservatives is no longer present. The two-party analysis suggests the trend has reversed, re-creating the pattern of the 1950s, while the three-party approach suggests that Labour's advantage is now greatly reduced. This has important implications for the next election and the scale of Labour's task to overturn the Conservative's overall majority in the Commons. The Conservatives appear to have learnt important lessons about vote distribution at the constituency level while Labour's superior ability to convert vote share into seats that saved it from disaster in 2010 could not be replicated in 2015. Further, the experience of the aborted 2012-2013 review of constituency boundaries showed that the Conservatives are now much better organised to outflank Labour during the public consultation procedure – a benefit they will undoubtedly sustain during the seventh review that starts in 2016 (Johnston, Pattie and Rossiter 2013).

A second point of agreement lies with the abstention and electorate bias components, both of which continue to favour Labour. The two methods acknowledge that because Labour wins it seats in relatively low turnout constituencies it is advantaged in this respect. The same is true for inequalities in electorate size but there is disagreement over the size of this effect and hence the future impact of boundary changes. When the new boundaries are implemented in time for the 2020 election we can say that the swing in seats resulting from the equalisation of electorate and

the reduction in representation of Scotland and Wales relative to England will effectively increase the Conservative majority by between about fourteen and thirty seats.

Arguably, the separate analyses that examine the different geographies and patterns of party competition add very little to our understanding of electoral bias. It is possibly stating the obvious that given its relatively large vote share and a return of just one seat that the system is biased against Ukip. Labour enjoys a positive bias on this analysis although the Conservatives too are advantaged in respect of vote distribution. The result in Scotland mirrored our findings for the 1997 general election – when a single party dominates the vote in this manner there is little bias but certainly a lack of proportionality. Previous elections in Scotland, where Labour polled heavily, resulted in an over-representation. But the separate treatment of England and Wales serves to highlight the damage done to Labour's overall position from its humiliation in Scotland. But the disaggregation of the national election (though mindful that this still excludes the Northern Ireland seats) into its separate parts is not necessarily an advance. Other elections provide examples where particular regions, for example, south west England, behave in dissimilar ways but previous examinations of bias have not felt the need to distinguish these areas apart. While the result in Scotland in 2015 is clearly different to the election that was played out in England and Wales that does not mean that electoral bias is better understood by moving away from consideration of the broader relationship between votes and seats.

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