Parliamentary Constituency Boundary Reviews and Electoral Bias

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To many observers, the result of the 2005 United Kingdom general election was a clear exemplar of the disproportionality that characterizes first-past-the-post electoral systems. The two leading parties – Labour and Conservative – were separated by only three percentage points in their share of the votes cast in Great Britain (36.1 and 33.2 per cent respectively), but whereas Labour obtained 56.5 per cent of the House of Commons seats the Conservatives got only 31.5 per cent. The Liberal Democrats were similarly disadvantaged – as they have been at all post-war general elections: with 22.6 per cent of the votes nationally they were allocated only 9.9 per cent of the seats. Such disproportionality was not the only consequence of the votes-to-seats translation process, however. There was also clear evidence of bias, suggesting that Labour was much better treated than the Conservatives: one analysis indicated that if they had each won 34.7 per cent of the votes cast, Labour would have won 111 more seats than the Conservatives (Johnston et al., 2006). More prosaically, analysis of the details of the votes cast in individual seats indicated that the Conservatives would need a swing to them away from Labour – with the Liberal Democrat and other parties’ vote totals and distributions held constant – of some 4.7 percentage points in order to become the largest party in the House of Commons, and one of 7.4 percentage points if they were to have an overall majority there. Labour could remain not only the largest but also the majority party, even if it came a close second to the Conservatives at the next general election.

There was much discussion about this disproportionality and bias, with many suggestions about its causes and how they might be eliminated – some of which related to the current electoral system and others to its replacement by one based on principles of proportional representation. One issue attracting considerable attention was variation in constituency electorates, and the observation that the seats won by Labour tended to be smaller on average than those won by the Conservatives: of the 125 smallest constituencies in Great Britain (with electorates less than 62,600), Labour won 96 and the Conservatives only 11 (and the Liberal Democrats 12): of the 125 largest (with electorates greater than 75,400) Labour won 36, compared to the Conservatives’ 69 and the Liberal Democrats’ 19 (Johnston et al., 2006). If constituency electorates were equalised, therefore, Labour’s
advantage might be removed, and ‘fairer’ election results eventuate – or so the argument went.

The United Kingdom has an accepted procedure for equalising electorates. A Periodic Review of Parliamentary constituencies is undertaken by the four Boundary Commissions – one each for England, Northern Ireland, Scotland and Wales – every 8-12 years (Rossiter et al., 1999). One of these had recently been completed for Scotland (where constituencies have on average been much smaller than those in England, although this was changed by implementation of provisions in the Scotland Act 1998. See Denver et al. 2004) and the ongoing reviews for the other three countries would be reporting before the next general election. Thus it was anticipated by some observers that Labour’s electoral advantage in 2005 would be eliminated and that there would be a ‘level playing field’ for all participants at the next contest.¹

The outcome of the Reviews did not produce the anticipated outcome, however.² The number of constituencies was increased by four, they were more equal in their electorates than ever before, and yet Labour’s advantage remained; if the 2005 general election were re-run in those new constituencies, there would still have been a substantial bias favouring Labour and disadvantaging both the Conservatives and the Liberal Democrats. Why should that be? One argument is that the Boundary Commissions have failed in their task: although they have significantly reduced the variation in constituency electorates substantial differences remain – which could be why Labour’s advantage has not been removed. Alternatively, it could be that equalising electorates is not the key issue: the asymmetries in the translation of votes into seats that currently favour Labour result from other factors.

This paper addresses those arguments by focusing on two misunderstandings. The first relates to the work of the Boundary Commissions which are required to review constituency electorates regularly and to ensure that they have equal electorates ‘So far as is practicable’, but various constraints to their operations mean that they can never achieve anything close to genuine equality; this is addressed in a discussion of those
constraints and the Commissions’ working practices. The second misunderstanding relates to the role of electoral inequalities (or malapportionment) in the production of disproportional and biased outcomes to first-past-the-post elections. To counter that, we use a new method of evaluating the amount of bias in election results to show the relative unimportance of malapportionment and the very limited impact of the Boundary Commissions’ changes with regard to electorate size on recent election results. Our illustrations of this point are drawn from analyses of the Commissions’ last two Periodic Reviews. The most recent, the Fifth review, reported in time for Scotland’s new constituencies to be used in the 2005 general election, and whose recommendations for the rest of the United Kingdom will be used first in 2009-2010. The Fourth review which preceded it reported after the 1992 general election, creating new constituencies deployed for the first time in 1997. We show that variations in constituency size would have made only a small contribution to electoral bias if each of these reviews had been enacted in time to be used in the 1992 and 2005 general elections. Other bias sources – entirely outwith the remit of the Boundary Commission redistributions – are thus the major operating factors.

The first section of the article clarifies the difference between the terms disproportionality and electoral bias. This is followed by a brief overview of the purpose and scope of the boundary review process using the recently completed Fifth Periodic Review as illustration. The third section describes a method for decomposing electoral bias not in a two-party but rather in a three-party system. This better reflects the reality of the party system in Great Britain that has emerged over recent elections. Following that we describe the process of estimating results. We then decompose the electoral bias for both the 2005 and 1992 estimated results and compare it with the composition of bias at the actual election in both cases. This data analysis of the two most recent reviews illustrates the impact of constituency boundary changes upon the distribution of seats between parties and also the effect, if any, on the components of any electoral bias contained within the system.
1. Disproportionality and electoral bias

A recurring feature of the UK electoral system, indeed virtually all examples of first past the post voting, is disproportionality between a party’s vote and seat share – larger parties often receive a much greater share of seats than votes, smaller parties obtain a lower seat than vote share. Proponents of first past the post voting systems believe this so-called winner’s bonus is a strength not a weakness; the largest party in votes will normally win a much larger share of seats than is commensurate with its share of the votes and as a consequence have a majority in the legislature even if it has only a minority of the votes cast. This advantage of seats over votes often extends to other large parties; assuming that more than two parties contest an election a relatively large second-placed party often emerges with a greater share of seats than votes. It is smaller parties, particularly those with a spatially-dispersed vote share, that are mostly disadvantaged by first past the post voting.

However, such disproportionality is not synonymous with electoral bias; an election outcome may be highly disproportional while electoral bias remains relatively low. Bias occurs when the parties are treated unequally in the process of allocating seats: if one party would get a larger share of the seats with a given share of the votes than would another party with the same vote share, then the electoral system’s operation favours the former over the latter. Bias is generated when there is asymmetry in the translation of vote shares into seat shares.

The production of bias is best understood by describing an election that is both disproportional and biased. Consider an election contested only by two parties, A and B, where each finishes with exactly half the votes. However, party A wins 60% of the seats with its half share while party B has the remaining 40% of seats. In this example, the lucky party’s bonus is a 20-point advantage of seats over votes and the outcome is highly disproportional. There is also a clear asymmetry in votes and seats – despite winning the same vote share as party A, party B suffers from a large degree of electoral or partisan bias whose production is discussed below.
By contrast to this example, the 1997 general election outcome is highly disproportional (Labour won 43% of votes but 63% of seats) but electoral bias, as measured by our three-party method, is not particularly large. Given Labour’s 13-point and 27-point leads in the popular vote over the Conservatives and Liberal Democrats respectively, it is an acknowledged and widely understood outcome of first past the post that a party that dominates its competitors to this extent is likely to win a clear majority of seats – the winner’s bonus. However, the Liberal Democrats, which in previous elections had suffered greatly from the voting system, were much more successful in targeting seats; the votes per seats ratio for the party at the 1997 election was three times smaller than it was for the Liberal/SDP Alliance following the 1983 election. Electoral bias and disproportionality, although closely related therefore, are separate features of an election result.

2. Re-drawing constituency boundaries

As indicated at the outset, the regular electoral redistributions undertaken by the Boundary Commissions are generally believed to reduce, if not entirely remove, any disproportionality and bias from election results. And yet, it seems that they do not. Why that is the case requires a clear understanding of the nature and scope of the review process is needed, as the basis for an appreciation of the limited impacts of any redistribution on the votes-to-seats translation process.

Since 1944, redistribution of parliamentary seats in the United Kingdom has taken place on a regular basis. Although the rules which the Boundary Commissions operate are to some extent unclear and contradictory, the main task of the redistributions is to ensure that constituencies in the relevant country conform to two main criteria. The first – and most important in that it takes precedence in the legislation – is to ensure that the constituencies nest within the major local government administrative areas. In England these are the Shire and Metropolitan Counties and the London Boroughs; in Scotland the unitary local authorities; in Wales the eight ‘preserved counties’ which were abolished for all other purposes when unitary authorities were created in 1995. In Northern Ireland
there is no such requirement. Basically, no Parliamentary constituency should cross any 
boundary separating two such authorities, unless a special case is made that this is 
necessary in order to meet the requirement in the other significant rule which states that, 
‘The electorate of any constituency shall be as near the electoral quota as is practicable’ 
within the context of the preceding rule relating to local government boundaries, although 
‘a Boundary Commission may depart from the strict application of [this] rule … if it 
appears to them that a departure is desirable to avoid an excessive disparity between the 
electorate of any constituency and the electoral quota, or between the electorate thereof 
and that of neighbouring constituencies in the part of the United Kingdom within which 
they are concerned’.³ For these purposes, the electoral quota is the total electorate of the 
country concerned at the start of redistribution, divided by the current number of seats 
there.

Although the principal goal of the Fifth Periodic Review was to achieve greater electoral 
equality across the Parliamentary constituencies in each nation of the UK, a number of 
factors – including the interaction of the two rules outlined here – operated to ensure that 
the outcome was far from equal. Although there was a reduction in the variation around 
the average electorate (and the quota), considerable variation in constituency size remains 
the norm and has implications for the continued production of electoral bias. The reasons 
for this are:

- The four countries are treated differently in the first rule that the Commissions must 
take account of, which states that Great Britain shall have not substantially greater or 
less than 613 constituencies, that Wales shall have not less than 35, and that Northern 
Ireland shall have not more than 18 and not less than 16. For Scotland, following the 
passage of the Scotland Act 1998, was required to use the same quota as England with 
the result that the number of its constituencies was reduced from 72 to 59. Wales was 
not similarly treated after the 1998 devolution settlement, however, and retains 40 
constituencies – at least 8 more than it would be entitled to if its Commission also 
deployed the English quota.
Each of the Commissions is also allowed to deviate from the other rules, especially that regarding electoral equality, ‘if special geographical considerations, including in particular the size, shape and accessibility of a constituency, appear to them to render a departure desirable’. This rule has always been interpreted as applying to sparsely populated, relatively-inaccessible areas only, and in the Fifth Reviews was only deployed by the Scottish Commission which applied it to the country’s Highland and Islands region and to the Orkney and Shetland isles. Thus, whereas 16 of the Scottish constituencies had electorates larger than the English average in 2005, four were very much smaller (with electorates of 21,576, 33,048, 46,837 and 50,507) which substantially reduced the national average constituency electorate to 65,083. Again, this has potential consequences for the operation of electoral bias.

Although the Commissions can combine adjacent local authority areas in order to reduce variations in constituency size, they have in general been unwilling to do this save in certain circumstances – notably at recent redistributions in Greater London and the Metropolitan Counties. The impact of this reluctance is most apparent with the Isle of Wight, which in 2005 had an electorate of 109,046 – way above the average for England of 70,021. The Boundary Commission for England, taking account of the opinions of island residents, has never been prepared either to allocate two constituencies or to attach part of the Isle of Wight to a mainland constituency in nearby Hampshire. Indeed, the allocation of seats within local authority areas according to their mean entitlement in terms of the national quota can itself give rise to sharp disparities. For example, following the most recent redistribution in England, Berkshire’s eight constituencies had a mean electorate of 72,655 whereas the five in neighbouring Wiltshire had one of only 64,430 electors. Within Greater London, despite some grouping of adjoining Boroughs, the differences were even greater: Croydon’s three constituencies averaged 77,200 electors, for example, whereas the comparable figure for nearby Wandsworth was 65,295; north of the river, Islington’s two constituencies averaged 59,946 electors, whereas Camden’s two had a mean of 76,440.
Constraints on how constituencies are delimited within a local government area also lead to variations in electorate size. The rules set out in the Parliamentary Constituencies Act 1986 make no reference to how this is to be done, save in Northern Ireland where ‘no ward shall be included partly in one constituency and partly in another’. Nevertheless, all of the Commissions have operated this system and all of the constituencies that they define are groupings of adjacent local government wards. In all cases this will mean that there is necessarily some difference between the constituencies within a local authority area. In some, it can generate considerable differences, because wards – especially in urban areas – are relatively large and their number is not divisible into an integer by the number of constituencies. Wandsworth, for example, had 20 wards to be allocated between three constituencies in the Fifth review. Following the redistribution two have seven wards and electorates of 67,111 and 69,445; one has six wards and an electorate of just 59,331. Walsall similarly had 20 wards and an allocation of three constituencies. In that case its electorates were 58,695, 66,287 and 64,995 – all well below the national quota of 69,934.

A further possible cause of continued inequalities is a consequence of the public consultations that the Commissions are required to undertake on their provisional recommendations for each local government area. These are frequently challenged by local interested parties, many of whom express a preference for alternative constituency architectures. Such challenges rarely use electoral equality as the predominant criterion for their alternative scenario. Instead, they use a provision in a later rule that ‘It shall not be a duty of a Boundary Commission to aim at giving full effect in all circumstances to the above rules, but they shall take account, so far as they reasonably can – (a) of the inconveniences attendant on alterations of constituencies other than alterations made for the purposes of [fitting them within the current local government boundaries] …, and (b) of any local ties which would be broken by such alterations’. To the extent that the Commissions accept the alternative proposals promoted at the Public Inquiries and commended to them by the Assistant Commissioners who hold those Inquiries, electoral equality is likely to retreat in importance somewhat. Thus in the Fourth Periodic Review in England, the average
deviation from the mean electorate within the relevant local government area, as a percentage of that mean, in the Commission’s provisional recommendations was 3.62 (with a standard deviation of 3.08); in its final recommendations, the average was 4.22 (standard deviation 3.22). The consultation process results in greater variation in constituency electorates once local community issues are brought to the fore.

- Finally, even if the Commissions were to achieve virtual equality across all constituencies within their country, this is almost certain to be diluted because of population changes – variations between constituencies in deaths, the number of residents reaching the minimum voting age, in-migration and out-migration. As constituencies age, so their electorates are likely to vary in their rates of change, with some (notably in suburban areas, growing towns and popular retirement centres) expanding rapidly whereas others (in declining manufacturing areas and inner cities, for example) may decline. Thus in England, the new constituencies deployed for the first time at the 1997 general election averaged 68,927 electors, with a standard deviation of 5,835; in 2001, for the same constituencies the average was 69,899 and the standard deviation 6,512; and in 2005 the respective figures were 70,203 and 7,472. As the constituency map ‘aged’, inter-constituency variations in electorate increased. Indeed, this happens even before an election is fought in the new constituencies. The Fourth review in England began in 1991 and its electoral quota of 69,281 was based on the then electoral register. By the time of the 2005 election the constituencies were not 8 years old (the period since the first election at which they were contested) but 14 years old. Although some of these changes might have been anticipated – through expectations of population growth given the number of planning applications for new housing in particular areas, for example – the Boundary Commissions do not take them into account; they operate only with the electoral quota determined at the start of each Review.

Because of this combination of factors constituencies will never have equal electorates. Unequal electorates are one of the factors that may contribute towards electoral bias and so it becomes clear that because of these constraints the boundary review process may not even eradicate the bias derived from this source. However, it may be that unequal
electorates make only a minor contribution to the total bias, in which case it is unreasonable to expect a Boundary Commission redistribution to ensure that all parties are treated equally in the votes-to-seats translation.

3. Measuring and Decomposing Electoral Bias

A number of methods for measuring electoral bias as defined here have been proposed. We favour one developed by a New Zealand political scientist, Ralph Brookes (1960), for a predominantly two-party system, and which we have recently extended to three-party situations, such as that which currently operates in Great Britain (Borisyuk et al. 2008). This not only provides a ‘norm of comparison’ against which any deviation (bias) can be assessed but also, and very importantly for our purposes, allows that assessment of the degree of bias to be decomposed into its various sources, including unequal electorates. Its use therefore allows us not only to establish the extent of bias but also to evaluate the role of unequal electorates in its production.

Brookes’ interest lay in understanding whether and how the geographical pattern of voting (i.e. the distribution of each party’s support across the constituencies), size of electoral units and turnout contributes towards one of the two parties in a two-party system receiving a bonus of seats relative to what the other would probably experience. He did this for any particular election result by establishing what we have subsequently termed a ‘norm of comparison’. This benchmark comprises two elements, first, the actual number of seats gained by one of the parties and, second, the number of seats that would be won if the vote share of the two parties at the actual election had been reversed. The latter figure is calculated by taking the overall vote shares at the actual election, say 53% for party A and 47% for party B and reversing them so that party B is now assumed to have won 53% and party A 47%. This six-point reversal in vote share is then applied to each constituency, assuming a uniform shift across the whole country, and the winning party there, which may now have changed, is noted. For each party, averaging the number of seats at the actual election and what we might call the ‘reverse-shares election’ produces the norm for comparison. Subsequently, if this average is smaller than the seats
won at the actual election then the party concerned is favoured by electoral bias, otherwise it is disadvantaged; formally, if one subtracts the average from the party’s actual share at the election, then it experiences a positive bias if it has more than the average (i.e. it gets more seats than expected if both parties were treated equally in the votes-to-seats translation process) and a negative bias if it has less than the average.

Having established the existence of and level of electoral bias Brookes then investigated those aspects of the outcome that had contributed towards it. Four factors are identified:

- **Geography** – acquiring votes requires the expenditure of resources and so the most efficient party is that which gets most seats for a given number of votes. This will be the party that both wins its own constituencies by narrow margins and, when it does lose, does so by a very large margin. In this way any ‘surplus’ and ‘wasted’ votes are minimised.\(^5\) “Win small but lose big” becomes a useful motto for a party optimising its vote distribution.

- **Malapportionment** – assuming turnout is constant across all constituencies and electorates vary in size, a party that wins seats in areas with small electorates will perform better than a rival that wins seats with large electorates – it will again get more seats for a given number of votes.\(^6\)

- **Abstention** – assuming electorates are equal in size but turnout varies, then a party that wins its seats in the low turnout areas will need to accumulate fewer votes than a rival that wins only in the high turnout areas.\(^7\)

- **Minor party effect** – as long as minor parties do not gain victories in those seats that a major party anticipates winning then the minor party effect is beneficial to the latter; the minor parties have attracted wasted votes and improved the overall situation for the winning party since it requires fewer votes itself to win (and accumulates fewer surplus votes). Conversely, should the minor party capture seats then the major party that loses them has now itself accumulated wasted votes.

- There may also be interactions between two or more of these factors – for example, if a party does well in areas where constituencies are both smaller than
average and have lower turnouts than average (Johnston et al., 2006). In applications of Brookes’ methodology these interactions are normally summed rather than separately identified.

The operation of these factors at both the actual and reverse shares’ elections reveals both the direction and composition of electoral bias. *The net bias for each party is the sum of bias derived from each of four components, some of which may be negative, and others positive.* It is only the malapportionment component in any bias that the Boundary Commissions are striving to remove directly when reviewing constituency boundaries and equalising electorates, however. Changing boundaries may, of course, have an impact on the geography of a party’s vote distribution – it may now find its majorities increased in some constituencies whereas, even worse, it changes from being a narrow winner to a narrow loser in other cases. But this is incidental to the boundary review process and of no direct concern to the boundary reviewers; the UK’s Boundary Commissions take no account whatsoever of political considerations when undertaking their reviews.

Brookes’ method works well enough for elections dominated by two major parties but it works less well for those where three parties compete and each wins seats. At some point, admittedly not always a precise moment, a system evolves from two-party to three-party when a minor party wins seats yet the two major parties, albeit weakened, remain in place. Currently, the UK system, where the third party Liberal Democrats now win not only about one-fifth of the votes cast (which they – and their predecessors – have done since the 1970s) but also a significant number of parliamentary seats, might be better regarded as three- rather than a two-party system. It seemed appropriate, therefore, to adapt the original Brookes’ method such that it could be used to measure and decompose electoral bias for the three-party case. We have now developed a procedure for doing this which retains many of the original features developed by Brookes. The seats won by the principal three parties are measured against a norm for comparison which shows whether the electoral bias for that party is positive or negative. The four separate components identified earlier – geography, malapportionment, abstention and minor party effects (now fourth and lesser parties) – together contribute towards the net bias for the three
leading parties. A comprehensive and technical discussion of the three-party method may be found elsewhere (Borisyuk et al. 2009). In what follows we apply this method to the situations following both the Fourth and Fifth Periodic Reviews of constituencies in Great Britain, in order to assess the impact, if any, on electoral bias brought about by the greater equalisation of constituency electorates achieved.

4. **Estimating the effects of constituency boundary changes**

For each of the last two reviews the partisan effects of boundary changes have been calculated for a media consortium comprising the three major UK news broadcasters – BBC, ITN and Sky News and, on behalf of print media, the Press Association. The media require an agreed set of results that show how the previous general election would have finished had the new rather than old boundaries been in place. These notional figures are used to construct new lists of target seats, marginal constituencies and the scale of national swing required for a change of government. On election night the broadcasters use estimated party vote share in the new seats to produce on-screen graphics for change in constituency vote shares.

If the UK collected and published parliamentary constituency results by local council wards, which are the building blocks for creating constituencies, compiling estimated results would be straightforward. In this circumstance re-casting votes from old to new constituencies would mean a simple re-distribution of the ward level general election voting data. But figures for each general election are only available at the constituency level and a means for estimating results is necessary.

There is no single, correct method for compiling estimates. The Plymouth team which has undertaken this task for the media uses results from local council elections to compile estimates, as did the team that compiled notional results for the 3rd periodic review (source BBC/ITN guide). Other methods for calculating notional results have been used. Rossiter, Johnston and Pattie (1997), for example, used the 1991 census to reconstruct results for the 1992 election, which differed only slightly from those produced using local
election results. For the latest revisions there are two other estimates of the 2005 election outcome on the new boundaries (www.electoralcalculus.co.uk and www.ukpollingreport.co.uk). Fortunately, there is general consensus about the overall impact of the boundary changes although some differences of detail remain.

Appreciating the procedure for producing estimates that relies upon local election results is important because it helps to clarify how the distribution of votes in the new constituencies are derived and underpins our assessment of the impact of the boundary changes upon the components of electoral bias. It begins by building a set of ward-level local election results for the old parliamentary constituencies. The local elections immediately prior to the general election are used. For example, for the 1992 estimates the 1991 metropolitan and district council elections were used whilst the 1990 results formed the basis for calculating votes across the London boroughs. Similarly, the 2005 estimates are based primarily on local election results covering the period 2002-2004.

There are some features of local elections that require adjustments to be made before the data are suitable for estimating party strength at the constituency level. To accommodate multimember wards, used in London boroughs and some shire districts, an algorithm for calculating total vote and party vote is employed since information about valid number of ballot papers included in the count are seldom published (Ware et al. 2006). In order to standardise each party’s vote in such cases this algorithm takes account of how many of the vacant seats it and other parties contested before determining how the votes for its candidates are to be averaged. Another problem affects those wards where one or other of the major parties does not contest a local election vacancy. Where a candidate is elected unopposed previous local election results for that ward are examined and vote shares estimated on that basis. If no comparison is possible (the ward is frequently unopposed or its boundaries are also new and no past data are available), then the winning party is awarded a vote share equivalent to that in its best performing ward in that local authority. A party that has not fielded a candidate is given a vote share equivalent to the vote received in its worst performing ward.
A final consideration is the support given to Independent candidates. In some rural wards Independents may be returned unopposed. Initially, past elections are examined to find evidence of party political candidates. If none exist then the ward’s social characteristics, derived from the nearest national census, are used to provide estimates of likely party voting. Such extreme examples are now quite rare. Where Independents and minor party candidates appear to have been given a free run by one of the three main parties their vote is given to that party as if they were its surrogate. When all the main parties contest a ward then the vote for Independents and other parties is ignored.

After any necessary adjustments local vote totals are in place for each of the old constituencies. Where a constituency experiences boundary changes, for example, some wards are migrated out of an old over-sized seat into another constituency, the local votes are summed for each party in the wards to be moved. It is assumed that across the wards that are migrating each party’s total local vote share is in equal proportion to its vote share at the general election. Thus, if the local election results across a group of wards show the parties’ vote shares as Conservatives 40%, Labour 35% and Liberal Democrats 25% then it is assumed that these percentages reflect each party’s relative strength in the same wards at the previous general election.

Dividing each party’s local vote in the wards being removed by the total local vote across the whole constituency and then multiplying that figure by the party’s vote at the actual general election provides the estimated vote for that part of the constituency that is migrating. This notional vote is then subtracted from the party’s actual vote in the old constituency, awaiting transfer into a new constituency. Any wards from another constituency that are being moved into the constituency will have been subjected to the same treatment before being transferred over. This method limits the scope for error because only the parts of constituencies that are being moved are subjected to calculations of this type – the part that is left intact carries forward towards the notional vote total. Another merit of this procedure is that no votes are gained or lost – votes that are exported from a constituency must be imported intact into another; the procedure is
therefore zero-sum. This means that the total votes calculated for the notional election equal the votes cast at the actual election.

Of course, this method can make no allowance for any changes to the tactical situation in a new constituency. For example, a party may move from third to second place and claim that, had the new boundaries actually been in place, then its vote would have been larger because tactical voters would have switched in its favour. This view assumes that supporters of a rival party would do nothing to counter this. The estimates, therefore, reflect the work of the Boundary Commissions in equalising electorates without imposing any artificial interpretations of how groups of voters might have behaved in a different tactical situation.

5 Comparing bias components at actual and notional elections

According to our evaluation of the impact of the boundary changes, the outcome of the Fifth Periodic review on the allocation of seats across the parties is not dramatic (Table 1). There is a small overall increase in the size of the House of Commons (from 646 to 650 seats), a net reduction in Labour’s seats, and a double-digit net increase in seats for the Conservatives. With the exception of Plaid Cymru, which loses one of its three seats, the smaller parties are unaffected. The increase in constituencies means that a party now requires 326 seats to acquire an overall majority. The reduction for Labour means that its majority of 66 seats in the Parliament elected in 2005 is cut to just 48 seats in the run-up to the next general election, at which a net loss of 24 Labour-held constituencies sees its overall majority disappear. The creation of 12 additional Conservative seats means the party now needs to win an additional 116 seats to form a majority government instead of the 126 seats it needed formerly.
Table 1: Actual and Estimated Seats for the 2005 General Election

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<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Estimate</th>
<th>Change</th>
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<tbody>
<tr>
<td>Labour</td>
<td>356</td>
<td>349</td>
<td>-7</td>
</tr>
<tr>
<td>Conservative</td>
<td>198</td>
<td>210</td>
<td>+12</td>
</tr>
<tr>
<td>Liberal Democrat</td>
<td>62</td>
<td>62</td>
<td>-</td>
</tr>
<tr>
<td>Plaid Cymru</td>
<td>3</td>
<td>2</td>
<td>-1</td>
</tr>
<tr>
<td>SNP</td>
<td>6</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>18</td>
<td>18</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total seats</strong></td>
<td>646</td>
<td>650</td>
<td>+4</td>
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The impact of the Fourth review was similarly modest (Table 2). The overall increase in seats was larger (from 651 to 659 seats) than for the Fifth review, but the widely anticipated Conservative gains based on the conventional wisdom that they normally benefit from redistributions which eliminate many small inner-city (generally Labour-supporting) constituencies scarcely materialised: as Rossiter et al. (1999) have shown, this is partly because Labour realised that careful development of cases to be presented at the Commissions’ Public Inquiries could minimise their losses, and the Conservatives were unable to respond to those tactics.. The Conservatives did have a net gain of 7 seats, but with Labour too registering a net increase in seats (2), the Conservative advantage was minimal. The remaining changes saw a net reduction for the Liberal Democrats and an increase of one seat in Northern Ireland. At the 1992 general election John Major’s Conservative party’s lead in the popular vote (they obtained 41.9 per cent of the votes cast, to Labour’s 34.4 per cent) resulted in a majority of just 21 seats in the Commons. The boundary changes modestly boosted the government’s notional overall majority to 27, but this remained vulnerable to a less than one per cent swing to Labour.
Table 2: Actual and Estimated Seats for the 1992 General Election

<table>
<thead>
<tr>
<th>Party</th>
<th>Actual</th>
<th>Notional</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservative</td>
<td>336</td>
<td>343</td>
<td>+7</td>
</tr>
<tr>
<td>Labour</td>
<td>271</td>
<td>273</td>
<td>+2</td>
</tr>
<tr>
<td>Liberal Democrat</td>
<td>20</td>
<td>18</td>
<td>-2</td>
</tr>
<tr>
<td>Plaid Cymru</td>
<td>4</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>SNP</td>
<td>3</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>17</td>
<td>18</td>
<td>+1</td>
</tr>
<tr>
<td>Total seats</td>
<td>651</td>
<td>659</td>
<td>+8</td>
</tr>
</tbody>
</table>

The explanation for the rather minor overall effects produced by the two boundary reviews becomes clearer after applying the method for decomposing three-party bias for the actual and notional elections in 2005 and 1992. Table 3 shows total bias for both results at the 2005 election along with the decomposition into its constituent elements.

The total bias at the actual election estimated by the three-party method is 165 seats, comprising a positive bias favouring Labour of 83 seats plus negative bias of 30 seats and 52 seats for the Conservatives and Liberal Democrats respectively. The corresponding figures for the notional election are total bias 148 seats, a positive bias for Labour of 75 seats, a smaller negative bias of 21 seats for the Conservatives and an unchanged negative bias affecting the Liberal Democrats.

Table 3: Decomposing the bias for actual and estimated election results (2005)

<table>
<thead>
<tr>
<th></th>
<th>Labour</th>
<th></th>
<th>Conservative</th>
<th></th>
<th>Lib Dem</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual</td>
<td>Estimate</td>
<td>Actual</td>
<td>Estimate</td>
<td>Actual</td>
</tr>
<tr>
<td>Total bias</td>
<td>+83</td>
<td>+75</td>
<td>-30</td>
<td>-21</td>
<td>-52</td>
</tr>
<tr>
<td>Electorate</td>
<td>+11</td>
<td>+4</td>
<td>-12</td>
<td>-6</td>
<td>-3</td>
</tr>
<tr>
<td>Geography</td>
<td>+41</td>
<td>+41</td>
<td>-5</td>
<td>+2</td>
<td>-46</td>
</tr>
<tr>
<td>Abstention</td>
<td>+16</td>
<td>+17</td>
<td>-14</td>
<td>-14</td>
<td>-10</td>
</tr>
<tr>
<td>Minor party</td>
<td>+3</td>
<td>+3</td>
<td>-3</td>
<td>-3</td>
<td>-1</td>
</tr>
<tr>
<td>Net interactions</td>
<td>+13</td>
<td>+11</td>
<td>+3</td>
<td>+0</td>
<td>+7</td>
</tr>
</tbody>
</table>

Note: Columns do not sum to totals because of rounding
Given that boundary reviews first and foremost aim to equalise electorates we begin with that element in analysis of the bias decomposition. The figures show that a positive bias towards Labour of 11 seats at the actual election has reduced to only 4 seats on the new boundaries. This is to be expected given that the electorates in Labour held areas had become rather smaller than elsewhere since the last review as a result of population changes. A negative bias from electorate size of 12 seats for the Conservatives was halved, as some of the large constituencies in the areas of population growth where it is strong were reduced in size, but it remains negative at -6. Again, given that the average size of electorates in seats won by the party in 2005 was larger than for other parties a reduction in bias from this component was anticipated. For the Liberal Democrats a negative bias of 3 seats positive bias, albeit one that is still worth only two seats. Overall these changes are fairly small – reflecting that the inequalities that had built up were not extreme save in a few areas and that the redistribution did not involve major changes to the constituency map in many parts of the country (other than in the special case of Scotland). Nevertheless, the continuing effects of unequal electorates favour Labour and still work against the Conservatives.

Almost half of the bias enjoyed by Labour in 2005 stemmed from geography, its superior distribution of vote; on average it is more likely to ‘win small but lose big’ than its opponents, notably the Liberal Democrats which amass very large numbers of wasted votes in the seats that they contest but lose (566 of the 628 constituencies in Great Britain at the 2005 election). This accounts for a positive bias of 41 seats from a total bias of 83 seats. The boundary changes have had no impact at all on this component as far as Labour is concerned; the geography of its support is insufficiently altered to affect the greater efficiency of its vote distribution. Because the total bias towards Labour reduces to 75 seats on the new boundaries, however, the geography component now accounts for more than half of the positive bias. The geography component originally accounted for very little of the Conservative negative bias, just 5 seats, but the effect of moving the boundaries now produces a positive bias of 2 seats. It is the third party Liberal Democrats that suffers most with its geographical disadvantage increased from a negative bias of 46 to an estimated 49 seats on the new boundaries.
Of the two remaining components the largest effect derives from abstention, which in recent elections has favoured Labour over the Conservatives; turnout tends to be much lower in seats where the former wins than in those where the latter prevails. The figures show that the abstention component continues to benefit Labour (16 seats for the actual election, 17 on the new boundaries), while disadvantaging the Conservatives (unaltered on 14 seats) and also the Liberal Democrats (10 and 9 seats respectively). As with the relatively small changes in the geography component, this is because in general the redistribution did not move many wards between constituencies of radically different political or social type in much of the country, thereby leaving the underlying pattern of turnout largely unchanged. The bias component from the distribution of minor party votes contributes little – unsurprising since the three-party method used here takes account of the Liberal Democrat presence and is only concerned with votes for nationalist and other small parties, which have an impact on the three main parties in a minority of constituencies only.

Table 4: Decomposing the bias for actual and estimated election results (1992)

<table>
<thead>
<tr>
<th></th>
<th>Labour</th>
<th>Conservative</th>
<th>Lib Dem</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual</td>
<td>Estimate</td>
<td>Actual</td>
</tr>
<tr>
<td>Total bias</td>
<td>+55</td>
<td>+51</td>
<td>-11</td>
</tr>
<tr>
<td>Electorate</td>
<td>+18</td>
<td>+8</td>
<td>-16</td>
</tr>
<tr>
<td>Geography</td>
<td>+18</td>
<td>+24</td>
<td>+17</td>
</tr>
<tr>
<td>Abstention</td>
<td>+10</td>
<td>+10</td>
<td>-8</td>
</tr>
<tr>
<td>Minor party</td>
<td>+3</td>
<td>+3</td>
<td>-3</td>
</tr>
<tr>
<td>Net interactions</td>
<td>+7</td>
<td>+6</td>
<td>-2</td>
</tr>
</tbody>
</table>

Note: Columns do not sum to totals because of rounding

Table 4 reveals that the effect of the Fourth review upon electoral bias was even less than that for the Fifth review. The original election resulted in less total bias, 101 compared to 165 seats in 2005, but the direction of bias (a 55 seat positive bias towards Labour, and negative bias of 11 and 42 seats towards Conservatives and Liberal Democrats respectively) is the same as for 2005. The pressing need to re-draw constituency
boundaries is reflected in the larger contribution to bias derived from the electorate component at the earlier election; it was worth 18 seats for Labour in 1992, a third of its overall bias total. This component hardly impacts on the Liberal Democrats’ unfavourable position, which is overwhelmingly caused by the party’s very inefficient vote distribution (geography). As in 2005, the Conservatives are adversely affected by the electorate component, which costs 16 seats at the actual election. However, this is compensated by the positive bias the party gains from its vote distribution – John Major’s majority was courtesy of some very narrow wins in marginal constituencies.

Although the boundary changes that came into force in time for the 1997 election were favourable for the Conservatives in terms of halving to 8 seats the negative bias from the electorate component, this benefit was cancelled out by a reduction in the positive bias from vote distribution. These movements are in the opposite direction for Labour; although the benefit from the electorate component reduces to 8 seats this is almost balanced by an additional 6 seats gained from the geography component. Labour’s more skilful exploitation of the opportunity to present evidence at the Public Inquiries to influence the boundary re-drawing is apparent; almost half of its positive bias now came from a superior vote distribution that followed from the boundary changes. The Liberal Democrats captured around one in five votes at the 1992 general election but succeeded in winning only 3% of the seats. It is unsurprising, therefore, to discover that the geography component accounts for most of the negative bias – a plethora of wasted votes again. The Fourth boundary review, as also the Fifth review, hardly affected the third party’s overall position.

**Conclusions**

The analysis of the two most recent parliamentary constituency boundary reviews in the UK shows that this process does not, and probably cannot, remove electoral bias, a bias that currently favours the Labour party. These reviews are first and foremost concerned with equalising electorates and therefore address only one of the elements that may contribute towards bias. The real value of Brookes’ method, adapted here to deal with
the reality of a three-party system, lies with its ability to disaggregate total bias and peer inside the mechanics that drive each electoral outcome, either actual or estimated. By comparing the composition of bias at the actual election with that for the estimated result we have shown the impact of boundary reviews upon bias.

In this respect the review that will be fully implemented at the next election is similar to its predecessor implemented at the 1997 election. Various constraints that effectively limit the Boundary Commissions from completely equalising electorates mean that even the contribution towards bias by this component is not totally removed. The Fifth review reduced Labour’s advantage from electorate size from 11 to 4 seats while the Fourth review still left Labour an 8 seat advantage. Moreover, there are four additional elements – geography, abstention, minor party and interaction effects – that are largely untouched by the boundary review process. Following the 2005 general election three of these (geography, abstention and interaction effects) made a larger contribution to the overall bias favouring Labour than did the electorate component; the Fifth review was destined only to make a small impression in reducing Labour’s overall bias advantage. The situation in 1992 is slightly different, partly because of the larger net increase in seats and partly because of Labour’s superior strategy during the review process which saw it increase its advantage from the geography component.

Hopes amongst Labour’s rivals that revising constituency boundaries might level the playing field are misplaced therefore. Labour continues to benefit from electorate size but its real advantage currently stems largely from a better distributed vote – it acquires fewer surplus and wasted votes than do its rivals. It is also benefitting more than other parties from the general decline in electoral turnout, requiring fewer votes for its victories. This is the reason that despite the boundary changes that come into force at the next general election the Conservative party needs, ceteris paribus, to hold a double-digit lead over Labour in the popular vote in order to secure even a slender majority in the next House of Commons.
References

Abstract

It was anticipated by some observers that the process of reviewing and then implementing new parliamentary constituency boundaries in the UK would remove the electoral bias that currently favours the Labour party. Despite the equalisation of electorates, however, the electoral system remains biased towards Labour. Whilst it is theoretically possible for Labour to secure fewer votes than the Conservatives at the next general election and still secure an overall majority in the House of Commons the Conservatives instead require a double-digit lead in votes over Labour to win a small majority. The explanation for why boundary reviews do not entirely remove bias can be shown by decomposing bias into its separate elements, electorate size, geography, abstention, minor party and interaction effects. Using a new method for de-composing bias in a three-party system and the results of the two most recent parliamentary constituency boundary reviews we demonstrate that much of the bias that favours Labour results from the geography of its vote distribution and low turnout rather than its success in winning constituencies with relatively small electorates.

1 As it happens, the new constituencies proposed by the Boundary Commission for Scotland – a reduction to 59 from the 72 used at the 2001 election – were in place in time for the 2005 election: only one – with an electorate close to the Scottish average – was won by the Conservatives
2 Following each review estimates are made of how votes would have been distributed had the new constituencies been in place at the previous general election. See Rallings and Thrasher (1995; 2007).
3 The rules are set out in full in Rossiter et al. (1999).
4 The Liberal party did propose a subdivision of the island into two constituencies at the time of the Third Periodic review, but put its representation in six months late.
5 Wasted votes are those cast for a party in constituencies where it loses, and thus make no contribution to the number of seats that it wins. Surplus votes are those in excess of the number needed to defeat its main opponent in seats that it wins – in effect, its majorities there.
6 With 20,000 electors in a constituency contested by only two parties, 10,001 votes are needed for victory; with 25,000 electors, 12,501 are needed. Thus in an area with 100,000 electors and five constituencies, a party with 50,005 votes would win five seats; if that area had only four constituencies, it would win only four.
7 The logic for this is given by reworking the data in the previous example. In a constituency with 20,000 electors and a turnout of 90%, 9,001 votes would be needed for victory; if turnout were 70%, then only 7,001 would be needed.
8 The notional partisan impact of the redistribution undertaken by the Boundary Commission for Northern Ireland is not included in any of the analyses which follow.