

Report of the Independent Commission on the Voting System: Volume 2

Submissions from academics

Report of group of academics chaired by Professor  
David Butler, Nuffield College, Oxford University

### **Covering note**

I was asked by the Jenkins Commission to consult a few academic students of elections to see if they could reach consensus on some technical questions about systems of proportional representation. Eight of us met in Oxford on June 12 1998. Those present were Vernon Bogdanor, David Butler, John Curtice, Patrick Dunleavy, David Farrell, Ron Johnston, Iain McLean and Helen Margetts; Philip Norton was invited but was unable to attend on that day.

It should be recorded that we did not discuss the desirability of proportional representation in general, nor did we seek a collective view on the overall virtues of particular versions of PR. It was clear that, in our personal capacities, we had differing views on what form of proportional representation, if any, would be most appropriate for the United Kingdom. But, in relation to almost all the technical questions that we discussed, we did reach consensus. Nonetheless, it must not be assumed that all of us agree on every word in the report that follows. I invited my colleagues to set down any substantial points of dissent, and, even if they did not do so, it is plain that each might have phrased points a little differently. Therefore it is for me alone to accept editorial responsibility.

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David Butler

## **Introduction.**

It must be stressed that any judgements about the operation of specific electoral systems have to be qualified by place and by time. The same electoral system can have very different consequences in different political cultures. It can also work very differently in the same country at different times. Moreover, when there is a change in electoral system, the voters and the parties have to face a learning process and the first contest under the new arrangements may be poor guide to what will happen later on. The stability of a country's government, the nature of its electioneering and the structure of its parties are each more likely to be modified because of social and cultural changes than because of altered electoral arrangements..

It seems right to offer this health warning at the start. However, although it is dangerous to extrapolate from the experience of one country to that of another, examples can be drawn from many parts of the world to demonstrate that changes in electoral systems can have far-reaching consequences. The central feature of an electoral system is the way in which it turns votes into seats (and therefore into governments). Sometimes the arithmetic lessons as well as the political lessons from different approaches really do possess cross-national relevance.

In this field one of the common reasons for disagreement lies in the fact that electoral systems can have very different ends. There is a basic division. On the one hand defenders of the UK *status quo* argue that the prime purpose of an electoral system is to produce an accountable government; they point out that only five British general elections out of the 26 in the twentieth century have failed to yield a single party majority. On the other hand advocates of change tend to focus on a system's success in accurately reflecting the divisions of public opinion, contending that the number of seats a party wins should depend solely on the number of votes it obtains. The First-Past-The-Post system plainly does not meet this requirement; the number of seats a party obtains depends not only on the percentage of votes it secures but also on their spatial distribution. In general a party whose support is geographically concentrated will usually gain more seats for a given vote than a party whose support is evenly spread.

No electoral system can fully reconcile these contrasting approaches- but some can do so more successfully than others.

We are conscious that, if the electoral system is changed, unforeseen problems will arise. These could best be dealt with by a permanent statutory Election Commission, as in Australia or India. Such a body could cope not only with the registration of parties and the drawing of boundaries (which fall outside our remit), but also with the ambiguities and unfairnesses which are thrown up by any electoral system. All electoral systems, without exception, start with snags and develop more. The problem for any society is to agree on the system with the least defects for its particular conditions-- and then to keep it fine-tuned [Butler 1998].

We added a few questions to those put to us by the Commission. But there remain areas upon which we have not touched. It is plain that any change in the electoral system may have far-reaching implications for party structure and finance. It is also plain that it may also have a major impact on the formation of governments, on the working of parliament and on the relations of ministers and civil servants [Butler 1986]. But these are matters on which any academic views would, on the whole, be speculative and contentious. We have tried to face the Commission's questions as professional analysts, free from political commitment.

## Questions.

### A. Election results in recent years

A.1. Has the influence of the cube law diminished? Why? Has this decline halted or will it continue?

*The 'cube law' states that if votes are divided in the ratio A:B seats will be divided in the ratio  $A^3:B^3$ ; in an evenly divided 600 seat parliament a 1% swing in votes will produce a 3% switch in seats (i.e. 18 seats, making a difference of 36 to the net majority). It should be stressed that the cube law is concerned with disproportionality not bias (see A.3 for this distinction).*

*But the cube law is not a 'law'. It is a statement of the likely ratio between seats and votes for the two largest parties. In the UK between 1935 and 1970 it happened to provide a reasonable summary of the way in which FPTP exaggerated the lead of the largest party over the second party. But its accuracy is contingent on the existence of a certain geographical pattern of party support (as well as on other factors such as tactical voting). After 1970 the required pattern no longer pertained because both Conservative and Labour support became too geographically concentrated in their respective heartlands, thereby reducing the exaggerative power of FPTP. However, since 1987 the decline in the exaggerative power of the system has not only been halted but has been somewhat reversed. Even so, the current distribution of party support only just satisfies the preconditions for a square law (if votes divide A:B, seats divide  $A^2:B^2$ ), let alone a cubic one.*

*Measurement of the exaggerative property of the system is confused by changes in the Conservative/Labour bias due to other causes. In 1997 a cube law would have given Labour a majority that was 20 seats greater than it actually achieved. In 1992 a cube law would have given the Conservatives a majority 159 greater (i.e. 179, not 20). The distortions implicit in these figures are due to the pro-Labour bias that has crept into the system in recent years for geographic (and turnout) reasons.*

A.2. Is it becoming more difficult for single parties to gain a majority under FPTP?

*Compared to the 1950s the chances of an election producing a hung parliament have increased. The ability of parties to obtain a majority under FPTP depends on three factors.*

*1. The degree to which the system exaggerates the lead of the largest party over the second party. (See A.1).*

*2. The existence or otherwise of bias as between the top two parties. Bias refers to the extent that one of the two largest parties secures a larger number of seats for any given division of the vote, holding other things constant. The electoral system exhibited a marked bias against the Conservatives in 1992 and 1997.*

*3. The size and distribution of the vote for other parties. The strength of the Liberal Democrats and the SNP has not been rewarded so well by the electoral system as has that of Plaid Cymru or of the main Northern Ireland parties (sometimes helped by pacts). This is because support for the Liberal Democrats and the SNP is geographically evenly spread, while that for Plaid Cymru and the Northern Ireland*

parties is concentrated. It has been important for the working of the system that the representation in parliament of parties other than Conservative and Labour grew from 7 in 1959 to 39 in 1974 and to 75 in 1997.

The result of the first factor is that, until recently, it was more difficult for both the Conservatives and Labour to secure an overall majority for any given share of the vote than used to be the case.

The effect of the second factor has been that it now appears more difficult for the Conservatives to win a majority than for Labour to do so.

The potential impact of these first two factors has, however, been somewhat mitigated because, since 1979, the lead of the first party over the second party has usually been greater than in most previous post-war elections.

The effect of the third factor has been to help to preserve both the leading parties' chances of winning an overall majority (despite the large rise in third party support since the 1950s) to a far greater extent than would have been the case if Liberal Democrat or SNP support had been more geographically concentrated. Even so, of the seven general elections held since the beginning of 1974, only four have produced parliaments that had majority governments throughout their lifetime.

A.3. Can deviation from proportionality under the current system be corrected to any significant degree by changing the criteria for redrawing constituency boundaries?

We must distinguish disproportionality from bias. Disproportionality refers to the difference between the parties' share of votes and share of seats. Bias refers to the difference between the two parties in the percentage of seats they would obtain, other influences being held constant, with the same percentage of the vote.

The principal sources of disproportionality have nothing to do with boundary-drawing or the detailed statutory rules which the Boundary Commissioners have to apply. Changes in these rules would do very little to make results more proportional.

Some of the biases in election outcomes have been due to the current system of defining constituency boundaries. The two most important factors are (1) England is under-represented compared to Scotland or Wales; and (2) even in England, constituency sizes start mildly unequal after each redistribution and grow more unequal as time passes; in practice, the longer since the last redistribution of seats, the more favourable the system has been to Labour

Some of the current sources of deviation from proportionality could be changed, though only slightly (a) by more frequent drawing of boundaries; (b) by introducing forecasts of population growth as a criterion; (c) by reducing the over-representation of Scotland and Wales.

All of these policies would be likely to prove controversial. In any event only a limited net difference could possibly result from pursuing these approaches. They could not cure the disproportionality of the sort experienced by the SNP and the Liberal Democrats.

In any election system, deviation from proportionality is influenced primarily by:

(a) District Magnitude. With a district magnitude below 4, proportional results cannot be obtained. FPTP has a district magnitude of 1, and gives the least proportional results under many configurations. ( We can estimate maximum deviation from proportionality under liberal democratic arrangements as  $100 - V_1$ , where  $V_1$  is

the largest party's share of the vote). The disproportionality level in Great Britain was 21% in 1997, and  $V_1$  was 44%, so the maximum disproportionality was 66%. Thus the level of disproportionality achieved under FPTP is around one third of the maximum possible disproportionality).

(b) *Malapportionment.* This refers to a mismatch between the spatial distribution of seats and of the electorate. Within Great Britain the main sources of malapportionment have been the quotas of seats set for Scotland and Wales, which have over-represented them: recent legislative changes will cut this problem for Scotland. The inevitable ageing of constituency boundaries adds a tiny amount to disproportionality. Theoretically disproportionality may also be affected by differential turnout, but there is no electoral system in the world where constituency allocations are related in any way to the distribution of votes rather than to the distribution of the electorate.

In general, no significant reduction in disproportionality can be expected from further action to improve the workings of FPTP.

A.4. Are the Curtice/Steed calculations on the present system's apparent bias towards Labour over the Conservatives generally accepted?

*Curtice and Steed [1997] calculated that if Conservative and Labour were to win the same share of the vote at the next election following a uniform swing of 6.5% from Labour to Conservative, Labour would have as many as 78 more seats than the Conservatives. The Conservatives would need nearly a seven point lead in votes in order to achieve a lead in seats. These calculations have been independently confirmed by Rossiter et al [1998] and Norris [1997]. There are four main reasons for this bias:-*

(a) *The average electorate in seats won by Labour is smaller than in those won by the Conservatives. This reflects(i) the impact of the continued movement of population from cities to the shires and (ii) the over-representation of Scotland and Wales.*

(c) *The turnout in seats won by Labour is lower than that in seats won by the Conservatives. While this has usually been the case, the gap has widened at both the last two general elections*

(d) *Labour's vote is more efficiently distributed; that is because a lower proportion of its vote is cast in seats where it loses narrowly or in seats where it wins easily. Over the last two elections, the Conservative vote has become quite evenly spread and the party is, as a result, suffering the kind of disadvantage that the first-past-the-post system has traditionally inflicted on the Liberals. In contrast over the same period Labour has benefited from increased tactical switching by Liberal Democrat supporters.*

(d) *The Liberal Democrats are more successful at winning seats from the Conservatives than they are from Labour. Indeed, the Liberal Democrat vote has become more geographically concentrated at recent elections, increasing the vulnerability of the Conservatives to third party losses.*

*Thus it can be seen that on three of these four criteria the pattern of party support has shifted to Labour's advantage over the last two elections.*

*It should be noted that the calculations of bias provided by Curtice and Steed*

*and others rest on the assumption that the distribution of party support would remain as it currently is even if the Conservatives' share of the vote were to rise. It might however be argued that some of the above features would be likely to change in that event. For example, if the Conservatives were to become less unpopular then tactical switching between Labour and the Liberal Democrats might become less common. It might also be suggested that the Conservative vote would recover more in areas of traditional strength, thereby reversing a crucial pattern in the 1997 election and improving the efficiency of the distribution of the party's vote.*

*On the other hand there are reasons why a significant bias against the Conservatives might still be present at the next election even if there were a significant Conservative recovery. There is evidence that new MPs in marginal constituencies tend to build up a personal vote [Curtice and Steed, 1998; Cain et al 1987]. Thus some of the new Labour MPs elected in 1997 in previously Conservative constituencies might be expected to suffer a lower than average swing against them at the next election. Meanwhile the pattern of migration will further reduce the relative size of the electorate in Labour constituencies at the next election. The difference in turnout between Conservative and Labour seats does not appear to be a function of Conservative unpopularity and so might well persist.*

*Such considerations must inevitably remain speculative. What they clearly demonstrate however is that the first-past-the-post electoral system cannot necessarily be relied upon to give most seats to the party that wins most votes; rather such an outcome is contingent upon the geographical distribution of party support.*

*With regard to bias (see A.3 above), Curtice and Steed, writing after the 1997 election, showed that if, on a uniform swing, the votes for Conservative and Labour had been equal, Labour would have won 338 seats and the Conservatives only 258; to get a clear majority of the 659 seats the Conservatives would need 43.0% of the vote but Labour would need only 37.3% [Curtice and Steed, 1997, p.316]. These calculations have been independently confirmed [Johnston et al 1998; Norris 1997]. It should be noted, however, that they rest on the assumption that the geographical distribution of Conservative support is independent of its level. If the Conservatives were less unpopular, the incidence of tactical voting against them might decline. Labour's votes were much more effectively distributed than those of the Conservatives in 1997, in part because of tactical voting. As a result there was a substantial bias in the system in favour of Labour; for any percentage of the vote the Conservatives would have secured between 60 to 80 seats less than Labour would have won for the same percentage.*

*How far some of the other biasing factors might reverse themselves in the event of a Conservative revival must remain highly uncertain. It should also be noted that the system exhibited a strong bias against the Conservatives in 1992 when they were not unpopular. Meanwhile, movements of population within the current constituency boundaries will, by the time of the next election, probably work to the Conservatives' disadvantage. Over the last forty years Labour has, on average, gained about two seats per year with the ageing of the constituency map.*

*To this answer Patrick Dunleavy adds a dissenting note: 'The Curtice-Steed calculations rely on a counterfactual which is not accepted as relevant by some political scientists, namely: 'What if the Conservative party in fact had got 44% of the vote in 1997 instead of the Labour party, while the spatial patterning of the vote remained exactly the same as the actual patterning?' Critics argue that if such a*

*switch in support were in fact to take place, the spatial distribution of the votes would inevitably shift - making the question an absurd 'parallel universe' speculation of no more than theoretical interest*

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## **B. General issues**

### B.1. Is there a correlation between electoral systems and turnout?

*Turnout is much more affected by a country's general political culture than by its electoral system. It has been declining in recent years in almost all advanced democracies.*

*It is, of course, arguable that in a proportional system, where every vote counts and where there may be a wider choice of appealing candidates, there can be incentives to vote that are missing in safe FPTP constituencies. PR systems do, to a large degree, cope with the 'wasted vote' argument for abstention.*

*Academic opinion is divided over whether there is a link between particular electoral systems and turnout. Studies either look across many countries at one time (a cross section approach) or over one country where the system has changed over time (a time-series approach). Time series analysis is unconvincing because there are too few cases, where, after the electoral system has changed, there has been a significant alteration in turnout. Cross-sectional analysis faces the difficulty that there cannot be a correlation between two things, one of which is not countable or rankable. All that can be shown is that there is an association i.e. that on the whole, PR systems tend to be associated with higher levels of turnout [Franklin 1996]. Other writers have suggested that a shift from a plurality vote electoral system to a PR one depresses turnout in the short term [Blondel et al.] The point has also been made about the Japanese switch to a variant of AMS [Reed; see also Powell; Blais and Carty].*

### B.2. Is turnout generally higher in the UK in marginal constituencies? Why?

*The main influences on turnout seem to be sociological rather than political. At recent elections turnout has been far higher in Conservative seats, including safe ones, than in Labour seats. This is one of the sources of the current bias against the Conservatives in the electoral system. In 1997, if the turnout had been the same in all seats (with the party percentages in each seat staying the same), Labour would have had a 13.9% lead over the Conservatives instead of the actual 12.5%. It has been calculated that the bias towards Labour due to differential turnout was equivalent to 24 seats [Johnston et al.]*

*But within that pattern the impact of marginality can be seen in seats that move in or out of marginality as a result of changing political circumstances. Turnout fell particularly heavily in 1997 in seats gained by Labour in 1992 (which had been marginal) and fell least in seats being defended narrowly by the Conservatives (which were marginal anew). But the net effect of marginality on turnout seems to be no more than 2%-3%.[Curtice and Steed 1997 p.300; Denver and Hands 1997]*

*The impact of turnout being lower in Labour-won seats than in Conservative-won seats helps to increase the disproportionality in the system as a whole because it*

*enables Labour achieves a higher seats/votes ratio than the Conservatives.*

B.3. Is there a correlation between electoral systems and representation (both in terms of (a) representation of women and minorities) and (b) geography?

*(a). Women and minorities.*

*The socio-cultural characteristics of a country are the greatest influence on representation of women and of ethnic minorities: the dominant values and attitudes towards their role in society and political life will influence their likelihood of getting elected. Differences in the candidate recruitment and selection procedures of political parties also influence social representation. These two factors are of course related: cultural characteristics will influence the extent to which political parties are likely to introduce effective gender or race equality policies.*

*However, the electoral system is one of the most widely accepted factors which explains cross cultural differences in the representation of women. Comparative studies indicate three factors in electoral systems which affect women's representation: (a) ballot structure (party list or single candidate), (b) district magnitude (the number of seats per district) and (c) the degree of proportionality [Lovenduski and Norris, 1993]. Research suggests that the one biggest characteristic of electoral systems that works against social representation is the single member constituency, as in first-past-the-post and the alternative vote. With party list systems, parties have a rational incentive to present a balanced ticket. List systems have undoubtedly tended to help women's candidacies in most countries. In parliaments around the world, in the early 1990s there were 17 per cent of women representatives; all the countries where the figure was 20 per cent or more used regional or national party lists (including Germany using AMS). In majoritarian countries the figure was 10 per cent or less [Norris in Leduc et al, 1996; Lovenduski and Norris, 1993; Norris 1996]: the exception was Ireland under STV, (see below). Even in the same country, in simultaneous elections, women do better under party list systems; in Germany, for example, in 1990 80 per cent of women who were elected to the Bundestag entered through the Land list route [Lovenduski and Norris, 1993: 313]. Similarly in Australia, which uses AV for the House of Representatives and multi-member state-level districts with proportional quotas for the Senate, in 1990 women MPs provided 7 per cent of House members and 25 per cent of Senators. There also is evidence from the change to proportional systems in both Japan (up from 2.7% to 4.6%) and New Zealand (up from 21.3% to 29.2%) led to an increase in women's representation. The increase was concentrated in the top-up seats (8% women in Japan and 45% in New Zealand)[Gallagher 1998].*

*Differences between multi-member list systems should also be noted. The prime difference lies in the methods used by the parties to formulate the lists. Where lists are selected by popular vote among party members it may be harder to achieve a balanced ticket than when party leaders make the choice. The pursuit of a balanced ticket by party leaders must, of course, depend on the acceptance of the principle that balanced tickets are electorally rewarding. List elements which allow voters to choose between candidates within parties (such as STV, or some forms of open list PR) also give voters a chance to vote against women or ethnic minorities. Dunleavy et al [1997] found in a simulation of an STV ballot, all parties' candidates with Asian or other ethnic names seemed to under-perform given their position in their party's slate,*

*with variations across regions and across parties. For example, when listed as the first name on Labour's slate in the North Region Ashok Kumar received only a third of first preferences for Labour, whereas normally the first candidate on a slate received around three quarters of first preferences. With respect to women, the same 1997 STV ballot suggested that, amongst Labour and Liberal Democrat supporters, women candidates were as much selected as men with similar levels of prominence and placings on the ballot paper. However, Conservative voters in some regions, notably the south west, still seemed less likely to support women candidates in 1997, as in 1992 [see Dunleavy et al, 1997 and 1992].*

*In summary, an electoral system with a multi-member list element facilitates an increase in social representation, but is not a sufficient condition to achieve it.*

*(b) Geography*

*Single-member districts can cause a serious territorial imbalance, as was demonstrated by the absence in 1997 of Conservative representation in Scotland, Wales and the big cities, as well as of any Labour representation in rural areas in the 1980s.*

*With STV the selection of candidates rests with the voters (insofar as the parties offer them a range of choice) . With list systems it must rest with the parties (though it may be decided by an elite or by a vote among the mass membership). However, while AMS with a regional top-up will correct regional imbalances in party representation it will not reverse urban-rural ones. Any 4/5 member constituency system would correct urban/rural bias. A national top-up AMS does, by itself, nothing to correct territorial under-representation in particular areas (e.g. the absence of Conservative MPs from Wales and Scotland).*

B.4. Would it be correct to say that it is not possible to have a proportional system which exclusively uses single member constituencies (without using larger districts and assigning the members to constituencies afterwards)?

*The short answer is 'Yes'.*

*However, the best losers system, suggested by the Blake Commission (and used in Baden-Wurttemberg), provides for single member constituencies as the basis for the distribution of additional seats. But it has the snag of giving some constituencies more than one representative and possibly of a candidate who comes third ending up as an MP while a candidate who comes second does not. [Bogdanor 1997]*

## **C. Formulae**

C.1. How important is the counting formula to delivering proportionality?

*Counting formulae are of some importance, as the answer to the next question (C.2) shows, but they are of far less importance than district magnitude - viz., the number of seats to be filled in each (or the average) constituency. Where that number is large (as with AMS for the House of Commons, using Scotland Wales and the standard regions of England as the units), the counting formula makes little difference. Where that number is small, as with the European Parliament, the*

counting formula can make a significant difference, with d'Hondt the least proportionate. [Seyd and McLean 1998; Dunleavy, Hix and Margetts 1998; O'Doherty].

*If the counting unit is nation-wide or very large, the difference between d'Hondt (favouring big parties) and Saint-Lague (unbiased as between large parties and small parties) will not be great. But if there are constituencies with few members, d'Hondt can give small parties many fewer seats than Saint-Laguë.*

*Germany used D'Hondt but abandoned it because of its excessive favouring of large parties [Lijphart 1994 (p.79), Bogdanor 1996].*

C.2. Is it possible to agree a ranking of the main contenders- Hare, d'Hondt, Sainte-Laguë, Droop etc., in terms of proportionality and the effect on large and small parties?

*There can be no agreed ranking, because the formulae are incommensurable. However, if a largest-remainders method of allocating seats is chosen, the Hare quota is unbiased as between large and small parties. Other quotas in use are biased in favour of large parties. If a divisor method of allocating seats is chosen, the Sainte-Laguë method is unbiased as between large and small parties. All other methods are biased in favour either of large or of small parties. All of this matters more in a system with low district magnitude (where it seriously affects overall proportionality) than in one of large district magnitude (where it has little impact on overall proportionality). The proportionality and the party effects of the different formulae will vary in different countries or circumstances [Gallagher 1992].*

*[See Appendix 1 for a more exhaustive discussion of alternative formulae]*

## **D. Electoral systems**

### **1. Majoritarian systems**

D.1. Is it the case that AV & SV will produce a more proportional outcome than FPTP in the majority of elections, but will, on occasion, be less proportional (e.g. 1997)?

*There is no reason why AV/SV should be more or less proportional than FPTP. The outcome must depend on the way second preferences divide. Normally, at least in the UK, AV would have favoured weak parties in the centre. It would therefore have helped third parties without in any way increasing proportionality as between two evenly matched big parties. In the UK in 1997 (though not in 1992), AV would certainly have yielded a more disproportional result, perhaps adding 25 seats to Labour's majority. In some Australian elections (e.g. 1975, 1977) AV has added a bit to the disproportionalities of very disproportional outcomes. In others it has diminished it. The Queensland election in June 1998 illustrates the capriciousness of AV. Thirteen of the 89 seats ended with a winner other than the candidate who led on first preferences. Some of the switches cancelled out but this table shows the net effect:*

|                 | <i>One</i>    |               |             |            |            |              |
|-----------------|---------------|---------------|-------------|------------|------------|--------------|
|                 | <i>Labor.</i> | <i>Nation</i> | <i>Nat.</i> | <i>Lib</i> | <i>Ind</i> | <i>Total</i> |
| <i>Votes</i>    | 39%           | 23%           | 16%         | 15%        | 7%         | 100%         |
| <i>Seats AV</i> | 44            | 11            | 23          | 9          | 2          | 89           |
| <i>FPTP</i>     | 51            | 9             | 19          | 10         | 0          | 89           |

*The deviation from proportionality is 20% for AV and 24 % for FPTP*

*It is easy to produce hypothetical situations in which, with the same overall division of the vote, a slight change in its distribution could give a third party no seats or every seat. Here is a totally absurd illustration of a totally paradoxical pair of outcomes.*

*600 seat House. LibD are 2nd preference of all Con.voters and all Lab.voters.*

*Scenario A*

| <i>Result in first 300 seats</i> |              |           | <i>Result in second 300 seats</i> |              |              |           | <i>Overall result</i> |              |              |     |
|----------------------------------|--------------|-----------|-----------------------------------|--------------|--------------|-----------|-----------------------|--------------|--------------|-----|
|                                  | <i>%vote</i> | <i>AV</i> | <i>seats</i>                      |              | <i>%vote</i> | <i>AV</i> | <i>seats</i>          | <i>%vote</i> | <i>seats</i> |     |
| <i>Con</i>                       | 49           | 49        | 0                                 | <i>Lab</i>   | 49           | 49        | 0                     | <i>Con</i>   | 37           | 0   |
| <i>Lib D</i>                     | 26           | 51        | 300                               | <i>Lib D</i> | 26           | 51        | 300                   | <i>Lib D</i> | 26           | 600 |
| <i>Lab</i>                       | 25           | 0         | 0                                 | <i>Con</i>   | 25           | 0         | 0                     | <i>Lab</i>   | 37           | 0   |

*Scenario B*

| <i>Result in first 300 seats</i> |              |           | <i>Result in second 300 seats</i> |              |              |           | <i>Overall result</i> |              |              |     |
|----------------------------------|--------------|-----------|-----------------------------------|--------------|--------------|-----------|-----------------------|--------------|--------------|-----|
|                                  | <i>%vote</i> | <i>AV</i> | <i>seats</i>                      |              | <i>%vote</i> | <i>AV</i> | <i>seats</i>          | <i>%vote</i> | <i>seats</i> |     |
| <i>Con</i>                       | 51           | 51        | 300                               | <i>Lab</i>   | 51           | 51        | 300                   | <i>Con</i>   | 37           | 300 |
| <i>Lib D</i>                     | 26           | 49        | 0                                 | <i>Lib D</i> | 26           | 49        | 0                     | <i>Lib D</i> | 26           | 0   |
| <i>Lab</i>                       | 23           | 0         | 0                                 | <i>Con</i>   | 23           | 0         | 0                     | <i>Lab</i>   | 37           | 300 |

D.2. On what occasions would AV produce a different result from SV?

*The Supplementary Vote produces similar results to AV when there are only three candidates. When there are more the crucial factors are (a) how close the second candidate is to the first (if close, later preference may play a crucial role under AV); (b) who comes second and who comes third; and (c) whether fourth or fifth candidates have substantial votes.*

*In a few constituencies in Scotland and Wales, with their multi-party systems, tactical voting and anxieties about 'the wasted vote' (which AV largely eliminates) are reintroduced by SV.*

*Candidates coming third in terms of first preferences can never win under SV. This may discourage the multiplication of parties. In fact there seems to have been only one constituency in 1992 or 1997 when there would have been a different result under SV from that under AV (Inverness, 1992).*

*The Supplementary Vote is in practice very akin to the Second Ballot used in France.*

*[Dunleavy et al. 1997].*

D.3. How often will SV produce a winner with less than 50% of the vote?

*Under SV, the number of seats won without a majority will depend first on the number of candidates and then on the number of supporters of lower candidates who*

either do not use their second preference or use it to vote for other lower order candidates. The evidence provided below is taken from two simulations of SV carried out directly after the 1992 and 1997 elections [Dunleavy et al. 1992 and 1997].

In the 1997 election, under first-past-the-post, 301 seats were won with under 50% of the vote (47% of total seats). In the Making Votes Count simulation of SV [Dunleavy et al, 1997] 134 seats were won with less than 50% of the vote (21% of total seats) after third and subsequent preferences of other seats had been transferred. For England, Scotland and Wales, these figures break down as:

|          | Total<br>seats | Seats won with<br>less than 50 %<br>FPTP<br>% | Seats won with<br>less than 50%<br>SV<br>% |
|----------|----------------|---|--|
| England  | 529            | 49  | 22   |
| Scotland | 72             | 42  | 14   |
| Wales    | 40             | 28  | 13   |
| G.B.     | 641            | 47  | 21   |

In 1992 under FPTP 251 seats (40%) were won with less than 50% of the vote. In a similar simulation of SV carried out by Dunleavy et al (1992), 98 seats were won without a majority (16%).

A seat may be defined as marginal if the runner up is less than 5% behind the winner. In the 1997 election under FPTP, 67 seats (11%) came into this category and could be defined as marginal. Under a simulation of SV in 1997 (Dunleavy et al, 1997) 85 seats (13%) came into the marginal category, where marginal for SV is taken as 5% or less difference between the votes of the winner and runner up after the second preferences of voters who voted for discarded candidates have been transferred. The breakdown across England, Scotland and Wales was as follows:

|          | Total<br>seats | Marginal<br>seats<br>FPTP<br>% | Marginal<br>seats<br>SV<br>% |
|----------|----------------|--------------------------------|------------------------------|
| England  | 529            | 12                             | 16                           |
| Scotland | 72             | 3                              | 3                            |
| Wales    | 40             | 5                              | 0                            |
| GB       | 641            | 11                             | 13                           |

Under AV, candidates may win a seat which they would not have won under SV (i.e. after preferences for the fourth or fifth candidates have been transferred) and seats which may change under the two systems also have a chance of becoming marginal under AV. But according to the AV simulations carried out by Dunleavy et al (1992, 1997) AV seems to make very little difference to marginality, as to seats (see response to D2). In 1997, examination of all the individual seats where AV had a chance of making a difference revealed no examples of AV making the seat marginal where SV would have not given a marginal result. Of course, at some stages in the AV transfer process a seat may become marginal, and then lose its marginality when the seat is won (a rather complex definition of marginality to convey to voters). But there seemed to be only one seat where this would have happened in 1997. It should be noted that these calculations are based on two surveys where over 40 per cent of

*respondents gave no third and subsequent preferences on their ballots (Dunleavy et al, 1992 and 1997: sample size 8,925 and 1,901 respectively).*

## 2.STV

D.4. What are the most important factors affecting the proportionality of STV?

*It should be stressed that STV does not programme proportionality. Although the available evidence from elections in Ireland Malta and Australia shows STV producing relatively proportional results [Farrell et al 1996]. Since 1945, the winning party or coalition in Irish elections has always won a larger percentage of seats than of votes (which reflects the relatively small size of constituencies used there). The 'fairness' of STV will always depend on the size of constituencies and on the fracturing of party support. STV can provide an incentive to set up new parties. How a newly installed STV system would work would depend on the education of the electorate, either through formal publicity by government or parties or simply through experience of successive elections.*

*But the following factors-- not in rank order-- can be identified:*

*1. Size of constituencies. Irish elections between 1922 and 1970 became less and less proportional as constituency size fell.*

*2.Fairness of boundary drawing (gerrymandering is quite possible under STV).*

*3. Number of parties, especially of very small ones.*

*4. Scale of dominance of winning party.*

*5. Consistency of turnout (as in any constituency based system, the proportionality of STV may be affected by differences in turnout between constituencies – the 1998 Northern Ireland election put the Unionists first in seats but second in votes, in part because turnout was lower in strong Unionist areas).*

*6.Evenness of vote spread (with 5-member seats a party with 12% everywhere could fare disastrously, while if it got 24 % in half the seats it would do very well)*

*7. Number of preferences used.*

*(Factors 1 to 5 apply to all multi-member systems; factors 6 and 7 are only relevant to STV). [Farrell 1996]*

D.5. How does the number of members per constituency affect proportionality? For example, how disproportionate would an STV system be if it used only three-member constituencies?

*The larger the number of members per constituency the more proportionate will be the result (this is, of course, true for all other systems). In Ireland STV became less and less proportional between 1922 and 1969 as constituency size fell on average from 5.1 to 3.4. Taagepera and Shugart. in a wide-ranging survey, argue that, for PR systems generally, a district magnitude of less than 5 seats cannot be relied on to produce proportionality.. [Taagepera, p.114; Cox]*

D.6. Do parties under STV normally put up one more candidate than they think will get seats?

*In Ireland there is much argument over the ideal number of candidates to put up. The generally accepted rule of thumb has been that a party expecting to win one seat puts up only one candidate; if it expects to win two seats. it may put up two, three, or even four (depending on its overall 'vote management' strategy of chasing preferences from the far-flung ends of the constituency). The best number of candidates to nominate will depend on the solidity of the transfer of preferences within a party.*

*It has been argued that the best strategy for a large party is to put up one more candidate than the number of seats they have a reasonable prospect of winning*

*For the Australian Senate each main party usually puts up at least one more candidate than they have any hope of electing- but seldom a full slate.*

*In Britain the parties have developed an ideology of fighting every seat which might be hard to break under a new system.*

D.7. If STV constituencies were to be created on the basis of 'natural communities', how big would they be? What would be the variation in number of members per constituency?

*There is no general agreement on what is a 'natural community'. Since the 1944 Redistribution of Seats Act the Boundary Commissions have interpreted the term as referring to local authority areas. The changes to local authorities in 1974 and in recent years have led to an increasing crossing of such boundaries. Some of the regions designated for the 1999 Euro-elections illustrate the difficulties of creating large constituencies which have any real sense of identity or community.*

*For the purposes of multi-seat constituencies based on local authority areas, considerations of natural community might lead them to be varied from, say, 11 in Birmingham to 4 in Northumberland- or fewer in parts of Wales or Scotland. All agree that proportionality is hard to achieve with less than four-member or five-member seats [McLean and Butler 1996]. But different sizes can open up anomalies: a minor party would need 20% of the vote to get a seat in a four-member constituency but only 9% in a 10 member constituency.*

D.8. How complex need STV ballot papers be? Is there any evidence of their likely effect on (a) turnout and (b) spoiled papers?

*STV ballot papers vary quite dramatically in the three countries using STV for national level elections. In Ireland the candidates names are listed vertically in alphabetical order. In Malta the candidates names are listed vertically, also in alphabetical order, but grouped under party labels. The ballot papers for the Australian Senate are the most complex. Here the parties are listed horizontally with the candidates listed vertically underneath, but not in horizontal order {Farrell 1997; Farrell 1996 ch.6}. What is required of voters also varies in the three cases. For a vote to be considered valid or 'formal' in Australia a voter used to have to fill all the spaces but since 1984 has been allowed to endorse the party's recommended preferences by a single cross (90% choose this simplified option). Maltese voters are required to complete as many preferences as there are seats to be filled. In Ireland one preference will (or even an 'X') will suffice. There have been relatively few*

*spoiled papers in Irish elections, North or South of the Border.*

*It is difficult to draw any firm conclusions about the effects of ballot paper design on the number of spoiled votes or on turnout. Australia has compulsory voting. Malta has a long tradition of exceptionally high turnout. A detailed study of Ireland's relatively low turnout suggests that it has nothing to do with the electoral system [Sinnott 82-87].*

*The proportions of spoiled papers in Ireland and Malta are low by international standards, consistently under 1% in all post-war elections. The surveys reported in Making Votes Count suggest that voters would find STV the hardest system to understand.[Dunleavy et al. 1997].*

*When Australians, voting for Senators, had to number all the candidates in sequence, the average for spoiled papers was about 10% (it rose to 20% when there were 78 candidates in NSW in 1974). When, in 1984, Australia altered the rules so that a single cross could endorse a party list, the percentage spoiled fell to 3%. In Australia there is a tradition of parties issuing 'how to vote' cards outside the booths, so that puzzled voters can copy the approved listing.[McAllister and Makkai].*

*There is no reason to suppose that the number of spoiled votes would reach significant level if Britain were to adopt STV. The research by Dunleavy et al. [1997; see also Farrell and Gallagher] indicates that voters found STV to be the most complex system to understand; it required the most explanation. Undoubtedly its adoption would need a large-scale education campaign. Evidence from Northern Ireland and New Zealand suggests that such a campaign can be successfully carried out. There is no evidence of voters finding serious difficulty in switching to a new system.*

### **3.AMS (or MMP or two-vote)**

D .9. What is the evidence that having two votes under AMS actually extends use of voter choice?

*There are a number of different meanings of the term 'extension of vote choice'.*

*One possible meaning is that the range of options between which voters can choose is widened as compared with first-past-the-post. This might be achieved by increasing the number of parties that stand in elections or enabling voters to choose between more than one candidate of the same party.*

*A second possible meaning is that the strategic constraints upon the expression of voter choice are reduced. It is, for example, often argued that the current system discourages voters from voting for parties or candidates that do not have any chance of winning in their constituency.*

*A third meaning could be that a system provides more opportunities to express their preferences. This might be achieved, for example, by allowing voters to express second and later preferences rather than just a first preference.*

*No simple conclusion can be reached about the impact of AMS on the number of parties. In New Zealand its introduction in 1996 was accompanied by an increase in the number of parties. But in the former West Germany the number of parties fell to just three within a relatively short period after the introduction of AMS in the post-war period.*

AMS, as implemented in elections to the German Bundestag and the New Zealand House of Commons, does not enable voters to choose between candidates of the same party. It would however be possible to incorporate an open party list election into the additional member part of the election, by inviting voters to express a preference amongst the candidates of their preferred party's top-up list. Such a system has been implemented in Bavaria Land elections.

In some respects AMS does extend voter choice in the second sense. Voters can express a preference for whichever of the candidates standing in their single member constituency they would most like to see elected without that choice necessarily contributing to any increase in the total number of seats won by the party of their preferred candidate. Voters whose local candidate preference does not correspond to their national party preference are thus less constrained under AMS than under the existing system. Thus, for example, at the last election Conservative voters in Tatton who did not want to see the re-election of Neil Hamilton could have voted for Martin Bell while still supporting the Conservatives in the second vote. Note, however, that this feature of AMS remains true only so long as there are sufficient top-up seats to overcome fully any disproportionality in the distribution of first-past-the-post seats.

Voters may use AMS to express a second preference by giving one of their two votes to their second preference party. If, however, they do this in respect of their 'second' vote they may give an unintended advantage to that party over their first preference party. Use of the alternative/supplementary vote for the constituency contest would allow voters to express more than their first preference. However, so long as there are sufficient top-up seats to overcome the disproportionality of the outcome in these contests, these lower preferences would not have any impact on the overall outcome.

Evidence from Germany and New Zealand certainly indicates that voters do not necessarily cast both their votes for the same party. In Germany 16% of voters voted differently in the constituency and party list contests in 1994 [Forschungsgruppe Wahlen, 1994]. In New Zealand, in 1996, the figure was as high as 37% [Levine and Roberts, 1997]. It should be borne in mind however that such vote splitting might be a reflection of the strategic constraints of the AMS system rather than its opportunities. For example, voters may be reluctant to cast their constituency vote for a candidate/party who they believe has no chance of winning. Or they may wish to ensure that a party crosses the 5% threshold because of its implications for their preferred party's chances of being able to form a coalition.

D.10. How many additional members do you need to ensure a reasonable degree of proportionality (a) if you use a national list and (b) if you use regional lists?

D.11. Would the answer be different if the constituency members were elected by a system other than FPTP e.g. AV or SV?

*This must depend on the basic division of the vote. But with 25% of additional members most British elections could have been made proportional. And, with the flexibility of an uberhangmandate provision, any disproportion can in theory be cured by allotting a few additional seats if necessary [Taagepera & Shugart 1989]*

*But it is important to distinguish between the situation when the lists are national and when they are regional.*

National Lists. *We take national lists to refer to the three component countries of*

*Great Britain - England, Scotland and Wales - for anything else will discriminate against the nationalist parties. One approach which the Jenkins Commission might consider taking to the question of securing 'broad proportionality' would be to define limits of deviation to be deemed permissible on this criterion (such as 5 per cent or 10 per cent). Then one could ask what ratios of local to top-up MPs would be feasible within these constraints if national lists are used instead of regional lists. The immediate impact is concentrated in England, where currently 529 out of 641 MPs are elected (83 per cent of the total)..*

*The appropriate mixes meeting 10 and 5 per cent deviation levels are given below, for AMS and SV Plus systems, and for the 1997 and 1992 general election situations. The first figure shows the proportion of locally elected MPs, and the figure after the colon the proportion of top-up MPs.*

*AMS National lists*

| <i>Maximum<br/>Deviation</i> | <i>SV Plus or AV Plus</i> |              |              |              |              |              |
|------------------------------|---------------------------|--------------|--------------|--------------|--------------|--------------|
|                              | <i>Eng.</i>               | <i>Scot.</i> | <i>Wales</i> | <i>Eng.</i>  | <i>Scot.</i> | <i>Wales</i> |
| <i>1997: 10% target</i>      | <i>90:10</i>              | <i>67:33</i> | <i>75:25</i> | <i>75:25</i> | <i>67:33</i> | <i>75:25</i> |
| <i>1992: 10 % target</i>     | <i>90:10</i>              | <i>75:25</i> | <i>75:25</i> | <i>90:10</i> | <i>67:33</i> | <i>75:25</i> |
| <i>1997: 5% target</i>       | <i>75:25</i>              | <i>57:43</i> | <i>67:33</i> | <i>67:33</i> | <i>57:43</i> | <i>67:33</i> |
| <i>1992: 5 % target</i>      | <i>75:25</i>              | <i>57:43</i> | <i>67:33</i> | <i>83:17</i> | <i>57:43</i> | <i>67:33</i> |

*Source: Specially calculated for Jenkins Commission by P. Dunleavy and H. Margetts.*

*The general implication is that in order to achieve a 10% level of DV reliably in AMS, nine out of ten MPs could be elected in local constituencies in England, three quarters in Wales and two-thirds in Scotland. In order to achieve a 5 per cent DV score reliably in AMS these ratios would have to swing further towards top-up seats. And if SV was used to elect local MPs, then the ratios would need to include more top-up MPs under 1997 conditions, to compensate for the shift in local seats and worsened showing of the Tories when both first and second preferences are counted.*

*In order to guarantee that the DV limit is achieved completely reliably across all elections, it might be necessary to adopt ratios with more top-up seats than shown here. That can be best achieved by moving down one ratchet in the sequence below:*

|  |                                 |
|--|---------------------------------|
| <i>90% locally elected: 10% top-up MPs</i> | <i>nine-tenths local MPs</i>    |
| <i>83% locally elected: 17% top-up MPs</i> | <i>five sixths local MPs</i>    |
| <i>75% locally elected: 25% top-up MPs</i> | <i>three quarters local MPs</i> |
| <i>67% locally elected: 33% top-up MPs</i> | <i>two thirds local MPs</i>     |
| <i>57% locally elected: 43% top-up MPs</i> | <i>a majority of local MPs</i>  |
| <i>50% locally elected: 50% top-up MPs</i> | <i>half local MPs</i>           |

*However it has been calculated that in 1983 a 90:10 division between constituency and top-up seats would have produced a 16% deviation and even an 83:17 ratio would have produced an 11% deviation. A 10 % deviation could mean that a party with 46% of the vote got 56% of the seats. It should also be remembered,*

as Appendix 2 points out,, that there are dangers in relying on any one measure of disproportionality.

*Regional Lists for Top-up MPs.* We can estimate the regional effects with a high level of confidence, since Dunleavy and Margetts (1998) have shown that the following patterns apply with both the 12 government standard regions scheme to be used for European elections in 1999, and their schema with 18 smaller regions separating out conurbation areas from the rest of the government standard regions.

|       | Deviation from<br>Proportionality 1992 | Deviation from<br>Proportionality 1997 |
|-------|--|--|
| 50:50 | 5%                                     | 2%                                     |
| 57:43 | 5%                                     | 3%                                     |
| 66:33 | 5%                                     | 4%                                     |
| 75:25 | 7%                                     | 6%                                     |
| 83:17 | 11%                                    | 8%                                     |
| 90:10 | 14%                                    | 12%                                    |

Source Dunleavy and Margetts 1998

Thus, to keep deviations from prortionality consistently below 10% in 1992 and 1997 a ration of 75:25 would be required. With a ration of 83:17 AMS would have provided a broadly proportional result in 1992; in 1997 the deviation would have been 11% i.e. outside the 10% target but have the 22 % deviation that actually occurred.

Under SV plus in 1997 the deviations for the 50:50 mix and the 57:43 mix are almost identical with the equivalent AMS schemes. But for a 67:33 and higher mixes the deviation becomes significantly larger.

|       | 1997<br>AMS | 1997<br>SV+ |
|-------|-------------|-------------|
| 50:50 | 2%          | 2%          |
| 57:43 | 3%          | 3%          |
| 66:33 | 4%          | 5%          |
| 75:25 | 6%          | 8%          |
| 83:17 | 8%          | 11%         |
| 90:10 | 12%         | 15%         |

The answers must depend on the basic division of the vote. But with 25% of additional members most British elections could have been made proportional. And, as with national lists, an uberhangmandate provision could in theory cure any disproportion could be cured by allotting a few additional seats..

Since AV or SV have the potential to increase the disproportion of the constituency results, there might be a need for extra additional seats to compensate.

D.12. How complex need the AMS ballot paper be? Is there any evidence of their likely effect upon (a) turnout and (b) spoiled papers?

It is not complex in Germany or NZ. NZ provides the best example of the impact of a recent switch. Turnout increased in the 1996 election [see D.6].

## **E. Supplementary Questions**

E.1. Are there systems other than AMS, AV/SV, and STV that the Commission should be considering?

1. *The Commission might want to consider a national list system, if only to reject it.*
2. *The Commission might want to put forward a ‘tailor-made’ system and not confine itself to ‘off-the-peg’ models. For example, it could pursue an open party list system with about five members per constituency. The broad proportionality of such a system is evident in the work of Dunleavy et al. {Dunleavy et al. 1997}.*
3. *The Commission might wish to refer to parallel systems (as in Russia) if only to dismiss them.*
4. *The Commission might want to consider versions of AMS using open lists to elect top-up MPs.*

E.2. What systems enable voters to express coalition preferences?

*With STV the preference ordering of candidates can give a clear indication of voters’ preferences about the parties and allows voters to indicate of a prior coalition agreement or advice on voting.*

*With AMS ticket-splitting can suggest coalition preferences.*

*With AV/SV party second choices can indicate preferences.*

E.3. What systems encourage parties to declare coalition plans in advance of the election?

*Any electoral system that is likely to yield more than two substantial parliamentary delegations necessarily provokes questions about coalition plans. In any situation where a coalition is likely the media and the voters are certain to press the parties about their coalition intentions. There will also be opinion polls and focus groups whose findings will be widely reported.*

*The simpler the voting system the easier it is to express preferences. PR systems with large district magnitude make coalitions a virtual certainty). This may lead to pressure to announce coalition plans in advance.*

*Any electoral system that enables voters to express preferences for two or more parties can provide evidence on the combination of parties that has most popular support. This applies to any single or multi-member constituency system where the number of seats won can be influenced by the transfer of preferences. Parties then have an interest in co-operating and encouraging their supporters to transfer their preferences.*

*Any arrangements for apparentements or linking of lists will also encourage parties to declare preferences.*

#### E.4. Should the Commission insist on a uniform system for the whole UK?

*The separate STV system for Northern Ireland in Euro and other elections since the 1970s give a precedent for variation. Australia has, since 1951, used AV for the lower House and STV for the Senate. Other countries with PR have single member seats for outlying areas. The European Parliament is simultaneously elected by several different systems in different countries.*

*Obviously uniformity is desirable, but the UK is already committed to a multiplicity of systems (notably in the arrangements for Scotland, Northern Ireland, and London as well as for other local government in general).*

*If AMS is to be used there is a case for having different top-up ratios for England Scotland and Wales (See D.10 above).*

#### E.5. What systems encourage tactical voting?

*Every system contains a potential for some tactical voting. No system that the Commission is likely to consider, is proof against tactical voting (Satterthwaite 1975). However, in some systems it is easy to see how to vote tactically, because the information required is cheap; in others it is hard to vote tactically because the information that would be required for an effective tactical vote is beyond most voters. FPTP encourages everybody to vote tactically if they believe that their least-liked candidate may come first and that their favourite may come third or lower. At recent elections, some 15% to 20% of the UK electorate has been 'at risk' of voting tactically in this sense.*

*SV would create a smaller, but still substantial, 'at risk' population. The tactical voting problem should not be seen simply as 'how does one encourage voters who can't stand the Conservatives but are near to indifferent between Labour and the Liberal Democrats to vote sincerely'? In the circumstances of 1997, SV would have helped such people (although not necessarily in Wales or Scotland). But there are many classes of tactical voter, and these circumstances will change from election to election.*

*AV reduces the 'at risk' population further. But all elimination systems encourage the tactical voter to think whom it pays him or her to have eliminated.*

*Closed-list systems are in practice invulnerable to tactical voting by electors, but of course are highly vulnerable to tactical placing of candidates by parties.*

*STV, and open-list systems, are invulnerable in practice, because the knowledge of others' preferences and likely actions that would be required for an effective tactical vote is impracticably huge.*

#### E.6. Are there systems which discourage a multiplicity of parties?

*The lower the threshold the more the parties. FPTP is probably the most discouraging, but it can allow in small parties with strongly localised support to secure disproportionate representation.*

#### E.7. What is a desirable threshold in AMS- or other systems?

*Thresholds can be implicit or explicit. STV and single member systems implicitly set their own thresholds. Under STV in a five-member constituency it is necessary to get at least 16.7% of the preferred vote to win a seat. In the UK with FPTP no candidate has ever won with less than 25 % of the vote- and very few with less than 35%. Under the UK's current PR system for Europe the threshold for election in the Northern Region (4 seats) is 20%. In the South-East region (11 seats) the threshold is 8.3%.*

*Under national party list systems there are usually explicit thresholds. The actual figures of 5% used in Germany and New Zealand [Gallagher 1998, p.212] and 4% in Sweden were arbitrarily chosen; they were also qualified by an alternative threshold of winning three constituency seats in Germany or one in New Zealand. A threshold is a defence against the plethora of small parties possible in the nation-wide list systems of Holland and Israel, where the indivisibility of a member is the only threshold*

*There is an important difference between the threshold in a list system and one under STV. In a list system such as the German a party which gets under 5% finds all its support wasted. Under STV voters who support a party which fails to get any seats are still able to influence the result.*

*There can be problems about an equitable threshold when a country is subdivided into electoral regions.*

E.8. How often does it make a difference in AMS to have an uberhangsmandate provision?

*The uberhang provision made little difference to the size of the Bundestag until the 1990s. In 1990, however, there were six extra seats and in 1994 sixteen. Of these sixteen 4 went to the SPD and 12 to the CDU/CSU. This increased the government's majority from 2 to 10. In Germany a party can win all of the constituency seats on under 50% of the vote. In Thuringia in 1994, for example, the CDU gained a constituency vote of 42.9% and a list vote of 41.0%. Its constituency vote gave it all of Thuringia's 12 seats, which included an uberhang of 2 (Thuringia's normal entitlement to list seats being 10).*

E.9. In STV how many boxes should be filled for a vote to be valid?

*Voters may be discouraged by having too heavy a task. In Australia the number of invalid votes was very high in Senate elections when every candidate had to be numbered serially for a vote to be valid.*

*In Ireland a single cross in a box is valid. In current Conservative Euro-selections half the candidates must be rank-ordered for a vote to be valid [Dunleavy et al. 1997].*

E.10. Is it sensible to combine STV with a list system as in the Australian Senate?

*The change to the Senate election rules in 1984 has de facto turned the system*

*from STV into a list system with 90% of voters opting for the simple, one cross vote for a list. The change reduced the number of invalid votes but it made it even more certain that the party ordering of the candidates would not be overturned.*

E.11. How can by-elections be handled under STV or AMS?

*If a vacancy occurs in a multi-member constituency and there is by-election for one member, the seat will inevitably go to the locally dominant party even if the dead or retiring member came from a minority party [Gallagher 1996]. Thus there is no equitable way of holding by-elections under STV. or with AMS list seats. However, under AMS, there is no difficulty about holding by-elections for the single-member seats.*

E.12. What are the best measures of proportionality and disproportionality?

*There is no perfect measure. The technical arguments are set out in Appendix 2.*

E.13. Is ballot rotation or 'donkey voting' an important problem?

*Alphabetic or 'donkey' voting is a feature of all candidate-based electoral systems and particularly of those incorporating preferential voting [Darcy and McAllister]. However, in practice its effects on overall results have been negligible. One means, tried in Australia, of removing any suspicion of this alphabetical bias lies in ballot 'rotation', varying the order of the candidates on successive papers; this can prove costly and confusing [Darcy and Mackerras 1993]. Another approach, also used in Australia is to draw lots for position on the ballot.*

E.14. Should provision be made to prevent a party dominant in the AMS constituency section from exploiting the system by putting up no candidates for the list and giving their support to a 'shell' party or to a potential coalition ally? Should there be any restraint on apparentements?

*It has been pointed out [Dyer 1998] that where, under AMS, a party anticipates winning more seats in the single-member contests than the total of both single member and additional seats to which it will be entitled, it is not in that party's interest for its supporters to give their second vote to it. Such votes would add nothing to the party's total of seats. The party would be better off if its supporters either (a) gave their second vote to a prospective coalition ally thereby increasing their party's chance of securing power or (b) cast their second vote for a 'shell' party that did not contest any single-member seats and whose elected members would immediately join the 'real' party after the election.*

*These possibilities certainly exist in theory. It may, of course, be questioned how far a party could persuade supporters to vote for a 'shell' party without a*

*devastating loss in credibility. Such behaviour would also be capable of being discouraged by the provisions for the legal registration of political parties. The encouragement of tactical switching to coalition allies would, however, appear a plausible strategy and such behaviour might be considered desirable when it was recognised that it would allow for the electoral endorsement of a coalition. The only way of ensuring that such behaviour is not encouraged is by ensuring that the system contains sufficient additional members to prevent any party ever anticipating that it would secure all the seats it was entitled to through the constituency seats alone.*

## Appendix 1

### Quota

All PR systems must contain a rule to assign seats successively to the parties once the votes have been counted. All of them must first set, implicitly or explicitly, a quota which entitles a party to one (or one further) seat. Different quotas may be used, and, whichever quota is used, the system may assign seats by using it directly or indirectly. Systems which use the quota directly are called 'quota systems'; those which use it indirectly are called 'divisor systems'.

Where

$V$  = total votes cast

$S$  = total seats to be filled

the **Hare quota** is the natural quota  $V/S$ . The number of Hare quotas obtained by each party is obviously its exact theoretical entitlement to seats. However, the exact theoretical entitlement of parties to seats is almost never a whole number. If each party is awarded as many seats as the whole number portion of its theoretical entitlement, some seats will remain unallocated. Therefore, all quota systems of apportionment need a means of allocating the extra seat(s). Although the Hare quota is useful as a final check on the proportionality of an outcome, it should not be used as an algorithm. Lijphart [1994, p.23] states

'The Hare quota is impartial as between small and large parties and tends to yield closely proportional results.'

This is true if, but only if, a quota system such as the largest-remainder system (see below) is used to assign seats.

The **Droop quota**  $Q_D = \lceil V/(S + 1) \rceil$  where the symbols  $\lceil \ ]$  mean 'The whole number next above the number inside the brackets'. The mathematical justification of the Droop quota is that it is the smallest number that ensures that no more than the correct number of seats will be filled. If the quota is set any higher than the Droop quota, too few seats may be filled; if it is set any lower, too many may be filled. STV uses the Droop quota in Ireland. If the Commission recommends STV, it should also recommend using the Droop quota. The Droop quota is sometimes called the Hagenbach-Bischoff quota.

The **Imperiali quota**  $Q_I = V/(S + 2)$ . The **reinforced Imperiali quota**  $Q_{RI} = V/(S + 3)$ . These have no known mathematical justification. Although in use elsewhere in the world, they are not recommended.

The best-known quota system is the **largest-remainder** (LR) system (known in the USA as the Hamilton system for apportionment of seats to states). If the Commission recommends an AMS system, one option is for parties with fractional entitlements to seats to be given a seat each in declining order of the fractional part of their quota, using the LR system with the Hare (but not any other) quota. Lijphart offers a worked example [Lijphart 1994, p.155]. The Hare-LR system is quite proportional. Its proportionality cannot be compared with that of the Sainte-Laguë or d'Hondt divisor systems, however. This is because all the proportionality formulas embodied a conception of optimal proportionality into the formula (Gallagher 1991, p.38). Therefore, the short answer to question C2,(Is it possible to agree a ranking of the main contending formulae in terms of proportionality and the effect on large and small parties?) is 'No'.

The problem with the LR system is that it is non-monotonic. Members of the Commission who have studied (or helped to produce) the Plant report may not wish to

hear any more about non-monotonicity. The non-monotonicity of STV, mentioned by Plant, is not a serious practical objection to STV. If it were, it would disqualify AV and SV, endorsed by Plant, which are non-monotonic in the same way and for the same reason as STV. The non-monotonicity of LR is deeper and more serious. It was first discovered by the US Bureau of the Census in 1881, and is known there as the Alabama paradox. For the 1880 apportionment of seats in the US House, which was then done by the LR (Hamilton) method, it was shown that if the House had 299 members, Alabama would be entitled to 8 (Texas to 9, and Illinois to 18). In a house of 300 seats, Alabama's entitlement goes down to 7 (Texas goes up to 10 and Illinois to 19). This pathology arises because LR operates on the fractional part of quotas. It is incurable; all quota methods suffer from it [Balinski and Young 1982]. Most students of electoral systems therefore recommend that a divisor system be used instead.

The pure Sainte-Laguë system is the most proportional divisor system of those in use in PR countries. It is unbiased as between large and small parties. An almost equally unbiased system would be the equal proportions (Hill, Huntington) system, not in use anywhere for PR, but now used in the USA to apportion seats to states [see Gallagher 1991 for an algorithm]. The 'modified Sainte-Laguë' system used in Scandinavia has no mathematical justification. It appears that the parties in control of legislatures there changed it in order to make it more favourable to large parties. The d'Hondt algorithm is necessarily the most favourable to large parties of those used or proposed for divisor systems. No system biased in favour of small parties is used for PR, but at least one (the Adams system) has been proposed for the apportionment problem.

None of this ranks as highly as does district size (see C1) for determining proportionality of the outcome.

## Appendix 2

### Measures of proportionality and disproportionality

The first section of this reply treats the problem as one of measuring the parties' share of seats and comparing it with their shares of votes. It is impossible to explain this further without a little algebra.

$V$  = total votes cast

$S$  = total seats to be filled

$v_i$  = vote share for the  $i$ th party out of the  $n$  that have stood ( $i = 1, 2, \dots, n$ )

$s_i$  = seat share of the  $i$ th party

$D$  = any index of disproportionality. Particular indices are shown by subscripts to  $D$ .

All indices are scaled so that  $D$  of 0 indicates perfect proportionality, and  $D$  of 1 indicates perfect disproportionality. A  $D$  value of 1 means that all the seats go to parties which get no votes. The most extreme situation that can happen in a democracy is that one party wins all the seats in some unit. Unless there is serious malapportionment, that can only normally be the most popular single party. So the maximum practical value of  $D$  is  $(1 - v_m)$ , where party  $m$  is the modal (plurality) party.

The simplest and most widely used index is the Loosemore-Hanby (sometimes Rose) index:

$$D_{lh} = 1/2 \left( \sum |s_i - v_i| \right)$$

It has severe theoretical defects: in particular, it does not respect Hugh Dalton's Principle of Transfers [Dalton 1920]. It is insensitive to any changes except changes which move a party from overrepresentation to under-representation or vice versa. However, in many cases, its results do not differ much from those of better indices. It should not be when the question at stake is the relative performance of a group of parties each of which is over-represented, or each of which is underrepresented. If that is not at stake, it is an acceptable approximation to the standard deviation index.

Many other indices have been proposed. Monroe (1994) gives good reasons for rejecting (for the purpose at hand) all of them except the following, based on analogy with the statistical concept of standard deviation:

$$D_m = \sqrt{\frac{\sum (s_i - v_i)^2}{1 + \sum v_i^2}}$$

$D_m$  has all the virtues of  $D_{lh}$ , but also respects the Principle of Transfers and is statistically well-grounded. It is a little harder to calculate than  $D_{lh}$ , but not oppressively so.  $D_{lh}$  can be calculated by hand in a very short time;  $D_m$  requires a spreadsheet and a few formulae, but is not hard to set up [I. McLean can advise the Commission if required].

There are, of course, other criteria for judging the fairness of an electoral

system- for example, preserving order or respecting the winner, treating  $s_i = 0.5$  as a special case.

People evaluate the 'fairness' of electoral systems by other criteria which none of the normal vote-seat indices capture. It might be felt that outcomes should preserve the rank-order of parties - that a party which got a lower share of the vote than another should not get a higher share of seats. It would be easy to adapt the Spearman rank-order correlation ( for this purpose (though as far as we know this has not hitherto been done for electoral studies). [I. McLean can give advice if required]. As a special case of the above, a system which failed to award the largest number of seats to the party with the modal vote share could face special legitimacy problems even with a low  $D$ . This could be captured by an ad hoc binary measure. Finally,  $s_i = 0.5$  is a special case. If a party wins at least half of the seats, it can certainly form a government. Therefore, one may take a different view of a system which exaggerates the lead of the largest party but does not give it a majority of seats, compared to a system which does both. This, too, needs an ad hoc binary measure. A comprehensive measure of proportionality would thus be four-dimensional.

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**RECTOR'S LODGINGS EXETER COLLEGE OXFORD OX1 3DP**  
 Phone: 01865-279644 Fax: 01865-279674 E-Mail: David.Butler@nuf.ox.ac.uk

**July 6 version**

Here is the version that was submitted to the Jenkins Commission plus some minor corrigenda and an extensive expansion of D.10 /D.11 where some important points were accidentally omitted.. Further corrigenda are still possible. I am assured that further emendations can be put in before anything gets published. For example for want of a draft I had to omit a response to the Michael Dyer point about manipulating AMS (which was to have been E.14); some felt this was important and I would welcome a volunteer draft.

I have had a very warm personal note from Roy Jenkins, applauding the piece - but lamenting that he could not fully cope with Appendix 2

Meanwhile, let me thank you all for being so patient and scholarly. I had no idea that it would grow to so long a document.

Vernon Bogdanor, Brasenose, 01865-557931  
 e-mail: wendy.williams@bnc.ox.ac.uk  
 David Butler, Exeter College, 01865-279644  
 e-mail: david.butler@nuf.ox.ac.uk  
 John Curtice, Strathclyde University, G1 1XQ  
 0141-337-6579  
 e-mail: j.curtice@strath.ac.uk  
 Patrick Dunleavy, L.S.E. WC2A 2AE  
 01908-646922  
 e-mail: patrick@dunleavy.u-net.com  
 David Farrell, Manchester University, M13 9PL  
 0161-275-4902; 01457-867326  
 e-mail: david.farrell@man.ac.uk  
 Ron Johnston, University of Bristol, BS8 1TH 0117-928-7874  
 e-mail: R.Johnston@bris.ac.uk  
 Iain McLean, Nuffield College, OX1 1NF 01865-278646  
 e-mail: iain.mclean@nuf.ox.ac.uk  
 Helen Margetts, Birkbeck College, WC1E 7HX

0171-359-7518; 0171-631-6000

e-mail: h.margetts@pols.bbk.ac.uk

Philip Norton, University of Hull, HU6 7RX

01482-807538; 01482-465863

e-mail: p.norton@pol-as,hull.ac.uk

David Lipsey, 94 Drewstead Rd, SW16 1AG 0181-677-7446

e-mail: david.lipsey@btinternet.com

Gus Park, The Jenkins Commission, Clive House, Petty France SW1H 9HD

0171-271-8868

e-mail: votingcom@holis.demon.co.uk

#### D.4. What are the most important factors affecting the proportionality of STV?

*It should be stressed that STV does not programme proportionality. Proportionality is, usually, an incidental outcome of the system. Since 1945, the winning party or coalition in Irish elections has always won a larger percentage of seats than of votes. However, the 'fairness' of STV will always depend on the size of constituencies and on the fracturing of party support. STV can provide an incentive to set up new parties. How a newly installed STV system would work would depend on the education of the electorate, either through formal publicity by government or parties or simply through experience of successive elections.*

*But the following factors-- not in rank order-- can be identified:*

*1. Size of constituencies. Irish elections between 1922 and 1970 became less and less proportional as constituency size fell.*

*2. Fairness of boundary drawing (gerrymandering is quite possible under STV).*

*3. Number of parties, especially of very small ones.*

*4. Scale of dominance of winning party.*

*5. Evenness of vote spread (with 5-member seats a party with 12% everywhere could fare disastrously, while if it got 24 % in half the seats it would do very well)*

*6. Number of preferences used.*

*8. Consistency of turnout (as in any constituency based system, the proportionality of STV may be affected by differences in turnout between constituencies – the 1998 Northern Ireland election put the Unionists first in seats but second in votes because turnout was lower in strong unionist areas).*

*(Factors 1 to 5 apply to all multi-member systems; factors 6 and 7 are only relevant to STV). [Farrell 1996]*

**D.10. How many additional members do you need to ensure a reasonable degree of proportionality (a) if you use a national list and (b) if you use regional lists?**

**D.11. Would the answer be different if the constituency members were elected by a system other than FPTP e.g. AV or SV?**

*This must depend on the basic division of the vote. But with 25% of additional members most British elections could have been made proportional.*

*And, with the flexibility of an uberhangmandate provision, any disproportion can be cured by allotting few additional seats if necessary [Taagepera & Shugart 1989]*

*But it is important to distinguish between the situation when the lists are national and when they are regional..*

*National Lists. We take national lists to refer to the three component countries of*

E.13. Is ballot rotation or ‘donkey voting’ an important problem?

*Alphabetic or ‘donkey’ voting is a feature of all candidate-based electoral s* **E.14.** **Should provision be made to prevent a party dominant in the AMS constituency section from exploiting the system by putting up no candidates for the list and giving their support to a ‘shell’ party or to a potential coalition ally? Should there be any restraint on apparentements?**

*It has been pointed out [Dyer 1998] that where, under AMS, a party anticipates winning as many or more seats in the single-member contests than the total of both single member and additional seats to which it will be entitled, it is not in that party’s interest for its supporters to give their second vote to it. Such votes would add nothing to the party’s total of seats. The party would be better off if its supporters either (a) gave their second vote to a prospective coalition ally thereby increasing their party’s chance of securing power or (b) cast their second vote for a ‘shell’ party that did not contest any single-member seats and whose elected members would immediately join the ‘real’ party after the election.*

*These possibilities certainly exist in theory. It may, of course, be questioned how far a party could persuade supporters to vote for a ‘shell’ party without a devastating loss in credibility. Such behaviour would also be capable of being discouraged by the provisions for the legal registration of political parties. The encouragement of tactical switching to coalition allies would, however, appear a plausible strategy and such behaviour might be considered desirable when it was recognised that it would allow for the electoral endorsement of a coalition. The only way of ensuring that such behaviour is not encouraged is by ensuring that the system contains sufficient additional members to prevent any party ever anticipating that it would secure all the seats it was entitled to through the constituency seats alone.*