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Crooked Margins and Marginal Seats

James Cornford and Daniel Dorling

This article presents a new approach to the question of defining 'marginality' in a plurality electoral system with more than two parties, such as that found in Britain. The method described here has a significant advantage over more traditional definitions in that it uses the probability that a seat will actually change hands (based on the historical precedent), rather than being simply based on the size of the gap between the two best performing parties. Although the new method requires a significant amount of computation, this is rendered fairly trivial by the use of computers.

The article is in three parts. The first part presents the traditional definition of marginality and sets out some of the problems which are encountered when using this approach. The second part introduces the new method and applies it to the current electoral situation in Britain. A final section briefly draws out a few of the implications from the findings in part two of the article.

Traditional Marginality

What is a marginal constituency? The concept of marginality is used to direct attention to those seats which are most likely to change hands at the next election. There is, of course, no guarantee that a marginal seat will change hands; that depends on the actual behaviour of the voters in the following election. However, the perception of a seat as marginal influences the nature of electoral competition in that seat. First, perceived marginals make the obvious target for the party organizations, which can therefore be expected to concentrate their resources in those seats. Second, a seat which is seen as being marginal offers voters more plausible opportunities for effective tactical voting. Marginals are, therefore, different and, in terms of electoral competition, particularly important seats.

Because they are so significant, especially at elections which are expected to be close, accurate identification of marginals is important. Already, lists of 'marginals' are being published in Britain in preparation for the next general election, taking into account the recent boundary changes (see for example, *New Statesman and Society*, 1995), both to identify key target seats to the party organizations and as a guide to tactical voting for the electorate.

If marginals are so important, then how can we identify them? As Norris

and Crewe (1994: 2 "marginal seat"). The which came first at conventional definitions in terms of the total number of votes for the seat. Seats with a large gap are defined as 'safe' (or 'safeness') value: the gap between the first and second best performing parties. Marginality is extreme when the number of votes for the

However, let us not be wholly arbitrary in the definition. It generates a definition of 'safe' seats which is often used. The question is seldom asked by some authors 'mistake' vulnerability to turnover.

The traditional method is a simple graphical device (Miller, 1977; Linton,

The Electoral Triangle

The electoral triangle is a diagram which shows the distribution of parties on a flat plane. It can be shown the distribution of seats (Conservative, Labour, Liberal/SDP All now on). A dot in the triangle represents a seat won by the Conservative Party.

The closer the dots are to the triangle, the more competitive the seat. The traditional definition of marginality is shown on the triangle. The current numbers of seats

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and Crewe (1994: 216) point out, 'there is no consistent definition of a "marginal seat"'. The simple answer is that the margin between the parties which came first and second at the last election should be 'small'. A conventional definition of 'small' might be 'within ten percentage points in terms of the total number of votes cast for all parties'. Conversely, seats where the gap is large are defined as 'safe'. Of course, such a cut-off is arbitrary – we could choose another value. Equally, we can give a specific 'marginality' (or 'safeness') value for a given constituency in terms of the percentage point gap between the first and second parties. In its favour, this measure of marginality is extremely easy to calculate requiring only knowledge of the number of votes for the first and second parties.

However, let us note a key point about this definition of marginality – it is wholly arbitrary in terms of actual performance. By this we mean that it generates a definition which is rarely (if ever?) checked against reality. How often are 'safe' seats lost? How often are 'marginal' seats retained? This question is seldom explored; as Norris and Crewe (1994: 202) have noted, some authors 'mistakenly assume that the marginality of a seat is evidence of vulnerability to turnover' (see e.g., Curtice, 1992).

The traditional model of a marginal can best be illustrated by the use of a simple graphical device – the standard electoral triangle (Upton, 1976; 1994; Miller, 1977; Linton, 1987; Cornford *et al.*, 1995; Dorling *et al.*, 1996).

The Electoral Triangle

The electoral triangle allows us to plot the relative performance of three parties on a flat plane. For example, Figure 1 provides a graph upon which can be shown the distribution of votes by seat for the three main parties (Conservative, Labour and the Democrats or their forebears) at any given election. Readers who are unfamiliar with the electoral triangle may need some guidance in interpreting Figure 1. In the electoral triangle the share of the vote gained by each of the three main parties in each constituency is displayed graphically by a dot. A dot falling in the upper subsection of the triangle represents a seat won by the third party (in our case, that is the Liberal Party, Liberal/SDP Alliance, or Liberal Democrats – termed Democrats from now on). A dot in the lower right-hand subsection represents a seat won by the Conservative Party. Similarly, a dot in the lower left-hand subsection represents a seat won by the Labour Party.¹

The closer the dots are to the boundaries between the subsections of the triangle, the more (conventionally) 'marginal' are the seats that they represent. The traditional definition of marginality (in terms of a difference between the two leading parties of ten percentage points or less) can thus be shown on the triangle by inserting a few straight lines (see Figure 2). The current numbers of seats thus defined are shown in Table 1. The obvious

question which arises concerns just how reasonable these ominously straight lines actually are. Are seats which fall within the shaded area on Figure 2 really more marginal (in the sense of more likely to change hands) than those which fall outside the shaded areas? The only way we can test this is by examining the historical record.

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FIGURE 1
THE ELECTORAL TRIANGLE

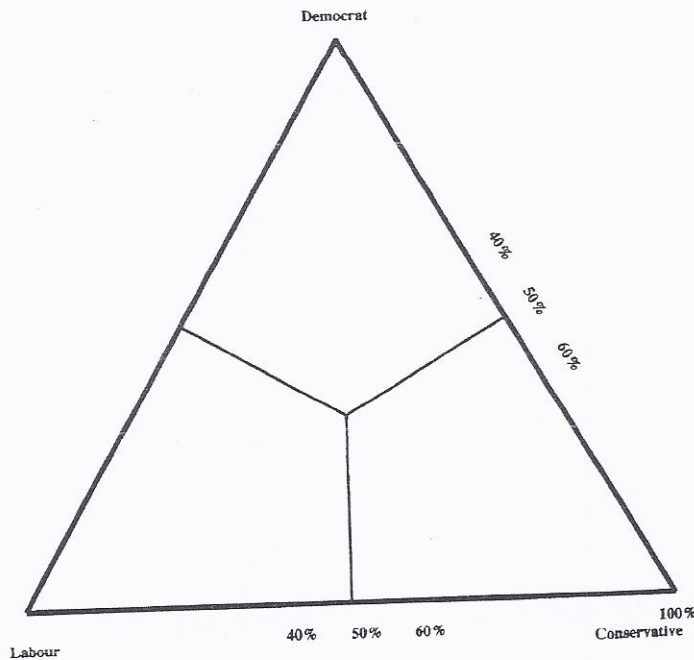


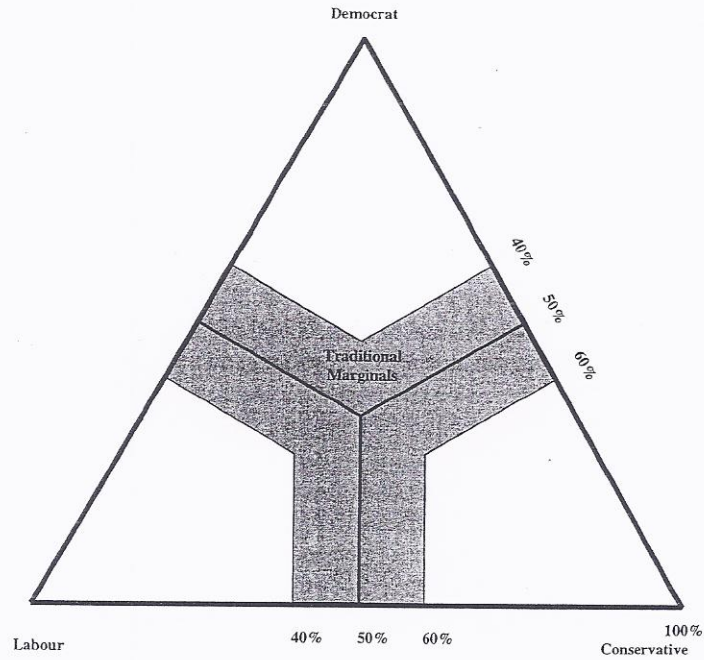
TABLE 1
CONVENTIONAL MARGINAL SEATS FOLLOWING THE 1992 GENERAL ELECTION
(after accounting for boundary changes, marginal = second party less than 10 percentage points behind winner in terms of the total poll)

Winner		Runner up				Total
		Con	Lab	LDp	Nat	
	Con	-	72	18	3	93
	Lab	61	-	2	1	64
	LDp	7	1	-	1	9
	Nat	4	0	1	-	5
	Total	72	73	21	5	171

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FIGURE 2
 THE ELECTORAL TRIANGLE WITH TRADITIONAL MARGINAL AREAS SHADED
 (where marginal = second party is within 10 percentage points of the winner)



The Historical Record

Most constituencies tend to be primarily *contested* (in the sense of being fought with a reasonable chance of winning) by just two parties regardless of the number of parties which put up a candidate. A simple analysis of every one of the six hundred plus British mainland parliamentary seats at each of the twelve² general elections from 1955 and 1992 (inclusive) reinforces this point. According to this analysis, there were 6,799 constituency contests in which at least two parties' candidates stood in a given election *and* in the subsequent election. A total of 6,730 of these seats (or 99.0 per cent) were won by one of the three main parties at both elections (that is to say, only 69 seats out of 6,799 have ever been won by parties other than the main three). Of the 6,730 seats dominated by the three main parties, 8.3 per cent changed hands at the subsequent election (a total number of 560). Almost all of the 560 seats which changed hands were won by the party which was in second place at the previous election of the pair (533 or 95.2 per cent). In summary: in any one seat in a British post-war general election, it is almost certain that only two



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Total	
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parties will be effectively contesting to win; in the vast majority of contests, just three parties – Conservative, Labour and Democrats (or their political forebears) – are significant ‘players’ (that is, come first or second).³

The concern with the first and second parties in the traditional definition of marginality therefore seems to be substantially correct. There still remains the issue of whether the straight lines (shown on Figure 2) are historically justified. Here we need to move to a different basis of calculation, once again looking to the historical record.

Probabilistic Marginality

How can we move from an arbitrary definition of marginality to one that is empirically based? The only reliable source of information for constructing such a discriminator is the historical precedent: for instance, if, for a given number of previous general elections, the proportion of seats represented in a given portion of the electoral triangle at each election t having ever changed hands at the subsequent election $t+1$, is low, then we can feel reasonably assured that any seat that is currently in that small segment of the triangle is unlikely to change hands at the next election. To be precise, in such a case we would say that there was little ‘historical precedent’ for the seat to change hands, and that that seat can therefore be regarded as ‘safe’. While we cannot be sure about this, we can create a much more defensible discriminator for sorting seats into ‘safe’ and ‘marginal’ categorizations than the traditional arbitrary cut-off.

Using this method, we can set the distinction between ‘safe’ and ‘marginal’ seats at a given level of probability, based on a given set of previous elections. To create this more rigorous discriminator for distinguishing between ‘safe’ and ‘marginal’ seats based on precedence, every election result for every general election from 1955 to 1987 was plotted on the electoral triangle. A grid was then superimposed over the triangle at the one per cent level to create several thousand individual cells. For each cell that contained more than five election results, the probability of a seat in that position on the electoral triangle changing hands at the subsequent election (1959–92) was calculated. Because some of the probabilities were based on a sample of only a few seats, and because the imposition of any particular grid over the triangle is arbitrary, it is desirable to smooth these probabilities locally on the triangle. Therefore, a single pass, two-dimensional, binomial smoothing process was undertaken to incorporate the probabilities of contiguous cells and thus to create a more robust probability for each individual cell. For each cell on this grid, the probability of a seat which falls within that cell changing hands at the subsequent election was thus calculated (this process is fully described in Appendix 1).

The resulting probability of a seat changing hands at the subsequent election, relative to the probability of a seat being selected to go on to distinguish between different levels of marginality. From the triangle can be defined as one which has been selected to go on to distinguish between different levels of marginality. For the purposes of this study, a seat is defined as one which has a probability of changing hands at the subsequent election (a one in ten or better probability) (on past elections) then that seat is considered as a ‘contestable’ seat.

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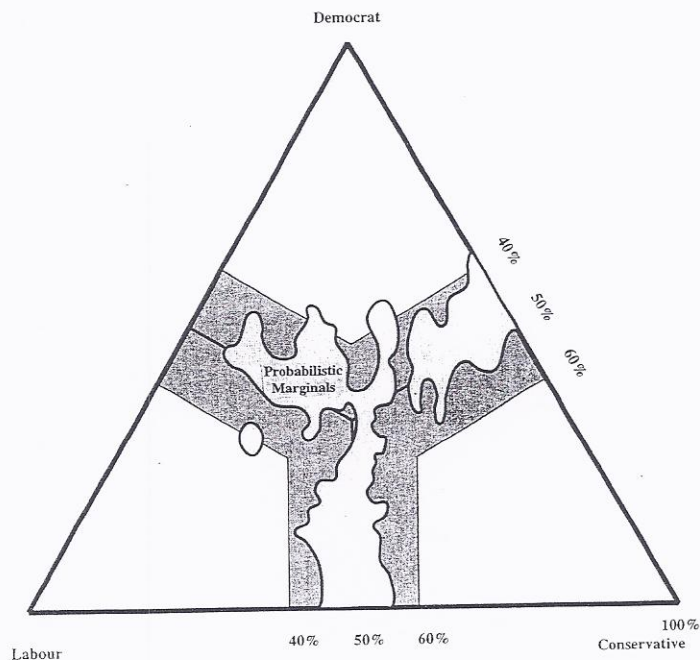
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The resulting probability surface can then be used to discriminate between different levels of marginality (which we will label as 'contestability' from now on to distinguish our probabilistic concept from the traditional concept of maginality). From this surface, 'probability contours' on the electoral triangle can be defined. The position on the triangle of each seat at each election, relative to the probability contours, defines its level of 'contestability'. In order to ease the following narrative, a cut-off point has been selected to group seats into just two categories ('safe' and 'contestable'). For the purposes of this article, a 'contestable' seat at any given election is defined as one which occupies a position in the triangle with a precedented probability of changing hands at a subsequent election which is 0.1 or greater (a one in ten or better chance). By contrast, if there was a less than one in ten probability (on past experience) of a seat in a given position changing hands, then that seat is classified as 'safe'. Lines showing these 'ten per cent probability of a seat changing hands' areas are shown in Figure 3.

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FIGURE 3
THE ELECTORAL TRIANGLE WITH PRECEDENTED
'CONTESTABLE' AREAS SHADED

(where 'contestable' = a historical probability of 0.1 or greater that a seat in that position will change hands at the subsequent election)



The 0.1 probability contour was selected in preference to some other level for a number of reasons. First, it creates a clear set of contiguous areas which appear intuitively meaningful when plotted on the electoral triangle. Such intuition is supported by the fact that 88 per cent of all seats which have changed were within the area delimited by the 0.1 contour, while 99 per cent of seats outside that area have not changed hands over the 1955–1992 period. By definition these figures compare favourably with those produced using the traditional concept of marginality. Further, the concept of a one in ten *or better* chance of a seat in that area having changed hand in the past is relatively easily comprehensible (the *average* chance of a seat defined as ‘marginal’ here changing hands at any election over the period is 28 per cent). Finally, and more whimsically, this one-in-ten cut-off contrasts nicely with the more traditional definition of a marginal seats as being one in which the second placed party is within, at most, ten percentage points of the winner. Other probability contours could, of course, be used to construct a number of bands of ‘contestability’. This possibility was not explored here because it would unnecessarily complicate the following analysis.

As we can immediately see (Figure 3), the neat and tidy straight lines of the conventional definition have been replaced by a much more complex shape. A first point to note is the much larger area of the Liberal Democrat portion of the triangle which is defined as contestable when compared with the sections of the other two parties. A second point concerns the relatively straight line separating Conservative safe seats from those that are contestable with Labour when compared with the equivalent line within the Labour portion of the triangle. For Conservative seats, it appears that the proportion of the vote going to the Liberal Democrats makes little difference to Labour’s chance of winning them. For Labour seats, by contrast, there is a greater probability of their being won by the Conservatives where the Liberal Democrats have a small but significant share of the vote. In Labour seats where the Liberal Democrat vote approaches 30 per cent, the Labour/Conservative contestable area narrows, as it does somewhat in seats where the Liberal Democrats have a very small share of the vote. It is where the Liberal Democrats have some 15 per cent of the vote that Labour seats appear to be most vulnerable.

Using the definition of a contestable seat as one which occupies an area of the triangle enclosed within the 0.1 probability contour, we can construct a table of safe and contested seats at a given election. Using the 1992 general election results, reallocated to take account of the new constituencies,⁴ we can replicate Table 1 with the new definition of contestable seats (see Table 2).

	Con
	Lab
Winner	LDp
	Nat
	Total

Note: Five marginal seats with means (within 10 per cent)

The only exception to Scottish and Welsh seats come first in 1992 on the ; we have used the traditional marginals (three where they challenge Democrats and one with Conservatives). This approach analysis to an extra dimension

1. There is still a paucity of precedents on which to base
2. It would increase the complexity
3. It would entail losing the dimensional electoral triangle

A full list of all seats with probability contour in the Appendix 2.

There are a number of important points to note. First, we take no account of the fact that very many of the Labour seats have changed hands at the next election. Further, and as an analyst, aware of the weakness of the Conservative seats which derives from their probabilities, is that it may be such as the 1983 election with

TABLE 2
PRECEDENTED CONTESTABLE SEATS FOLLOWING
THE 1992 GENERAL ELECTION
(after accounting for boundary changes)

	Runner up				Total
	Con	Lab	LDp	Nat	
Winner	Con	60	13	3	76
	Lab	—	1	1	75
	LDp	8	—	1	10
	Nat	0	0	—	1
	Total	81	61	5	161

Note: Five marginal seats where nationalists came second have been defined by traditional means (within 10 percentage points of the total vote (or less) of the winner).

The only exception to the probabilistic approach in Table 2 is in the Scottish and Welsh seats where the Nationalist parties are estimated to have come first in 1992 on the new boundaries (6) or second (40). In these 46 seats we have used the traditional 10 percentage point cut-off to give just six marginals (three where the Nationalist parties challenge the Conservatives, one where they challenge Labour, one where they challenge the Liberal Democrats and one where the Nationalists are challenged by the Conservatives). This approach was chosen in preference to expanding the analysis to an extra dimension for three main reasons:

1. There is still a paucity of previous election results in which the Nationalists were a significant force, thereby limiting the available precedents on which to base the probabilities;
2. It would increase the complexity of the calculations required; and
3. It would entail losing the ability to visualize contestability on the two dimensional electoral triangle.

A full list of all seats which occupy areas of the triangle within the 0.1 probability contour in the run-up to the 1997 general election is given in Appendix 2.

There are a number of drawbacks with this approach. First, and most importantly, we take no account of the current political context. It is unlikely that very many of the Labour-held seats defined as contestable will change hands at the next election. However, this is also true of the traditional measure and an analyst, aware of the current situation, should simply concentrate on the Conservative seats which have been defined here as contestable. A second weakness, which derives from using the historical record to calculate the probabilities, is that it may be unduly influenced by atypical election results, such as the 1983 election when the emergence of the Social Democratic Party

briefly bolstered the third party vote. Third, we do not take into account the changing nature of contestability over time. Finally, many other factors could be included in the model – for instance, the socio-economic characteristics of constituencies (for example, in- and out-migration levels), incumbency of candidates (which may make a seat less vulnerable) or the targeting of the seat by the national party organizations. All of these factors could be incorporated, to greater or less extent, in a more complex model. What we have done here is simply to make a first small step towards such a more complex model.

Implications

What are the implications of our findings? Four points emerge most strongly. The first is how well the arbitrary definition of marginality works in most cases. If we plot the relationship between the traditional measure of marginality (percentage point gap between the first and second parties) and our new probability based definition of marginality, we get a clear inverse relationship with relatively few outliers. Further, when we compare the results for individual seats, we can see that most of the discrepancies are minor.

A second point is the striking number of safe Conservative seats. The Conservatives seem to have had real 'strength in depth'. The impressive performance of Labour in the polls has led some to suggest that it would be possible for the Conservatives to suffer the same kind of defeat that was experienced by the Canadian Conservatives in the 1993 Federal Election. However, we should merely point out that such electoral 'meltdown' is unprecedented in the Canadian context – a Liberal Canadian government has undergone a similar collapse in the early 1980s (LeDuc, 1995: 163) – while such events are unprecedented in post-war British electoral history.

A further point that comes out of the analysis is the irrelevance of Labour/Democrat contests. With just one seat each in which the other party has a ten per cent or better probability of winning (Greenwich and Woolwich for Labour, Rochdale for the Democrats), there would appear to be little point in the two opposition parties attempting to win seats from each other (Crewe, 1993). Whether they are aware of this fact is another matter (see for example, Jones, 1994). For the same reasons, there seems to be little need for a formal electoral pact (as argued for by, for example, Dent, 1993) between the two opposition parties as they have little to win from competing with each other. Simple electoral calculation leading to the concentration of campaigning resources in each party's most winnable seats should generate the desired effect.

Most importantly, however, the analysis reinforces the huge mountain which the Labour Party have to climb if they are to form an administration after the next election. Even if we assume that the flow of the vote at the next

election will be large and Labour, the Democrats Conservatives will lose historically precedent actually does change ha absolute majority.

Postscript (2 May 1997)

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election will be large and uniformly away from the Conservatives and towards Labour, the Democrats and the Nationalists (for example, that only the Conservatives will lose seats), and even if every Conservative seat with a historically precendented one in ten or better chance of changing hands actually does change hands, Labour would still be five seats short of an absolute majority.

Postscript (2 May 1997)

After the election we can see that 'New' Labour did not so much climb the mountain as demolish it. It seems almost traditional for stable relationships identified by social scientists to collapse the moment that they have been identified and the result is a salutary, if pleasing, reminder of the dangers of claiming too much for the predictive powers of simple extrapolation from the past.

The Labour landslide at the 1997 general election, although still falling short of the Conservative meltdown in Canada, will have dramatically changed the shape of the marginality surface shown in the article, penetrating far deeper into the Conservative portion of the triangle and dramatically reducing the Conservatives' 'safe' area. Indeed, the majority of the seats won by Labour were not even marginal under the traditional (10 per cent) definition. One advantage of using the probability definition is that it can be changed over time to incorporate landslides such as this. In the end, what the election shows clearly is the limits of any purely mathematical definition of marginality. Such methods work – until they don't.

NOTES

1. The advantage of the graphical triangle over more traditional statistical measures is that the relative fortunes of three parties can be shown while still displaying the variation between seats. In most cases in Britain this is adequate. However, in situations where there is a significant fourth party (for example, the Nationalist parties in Scotland and Wales) these seats will be incorrectly represented as having been won by one of the three main parties, but the relative share of the vote between the three main parties will still be correctly represented. In the analysis we have generally omitted the handful of seats which have been won or contested by the Nationalists or other parties. It is, however, possible to use further dimensions (which cannot, of course, be correctly represented on paper) to include the Scottish and Welsh nationalist parties and 'other' candidates. Between 1955 and 1992 there were two geographical re-districtings of seats. Cornford *et al.* (1993) discusses how these were dealt with and gives the data sources.
2. Of course, there have been only eleven general elections between 1955 and 1992. However, a further set of changes is included as a pseudo 1979 election (reaggregated to the 1983 seats – see BBC/ITN, 1983) to represent the major redistricting which took place between 1979 and 1983. The reason for this is to illustrate the possible magnitude of such major boundary changes. The dataset used in this analysis has been deposited in the ESRC Data Archive at

- Essex so that other researchers can access it (Dorling *et al.*, 1993). It is based on many previous studies deposited at the archive including previous attempts to geographically link constituencies over time.
3. The only exception to this rule (accounting for almost all of the 69 seats in which any party other than the main three parties came first or second at successive general elections) is in Scotland or, to a lesser extent, Wales where Nationalist parties are significant contenders in a number of seats. Even in these non-English seats, although somewhat less clearly, the tendency is for a sustained pattern of two-party contests to emerge with the nationalists contesting with one of the three main parties.
 4. Estimates for the 1992 election results, based on the current (1996) electoral boundaries were made by David Rossiter (see Pattie *et al.*, 1996).

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APPENDIX 1
MEASURING THE CONTESTABILITY OF ELECTORAL POSITION BASED ON
HISTORICAL PRECEDENT

This appendix describes the technical details of defining parliamentary constituencies as contestable or safe based on the election results of all general elections since 1955 in Britain. Constituencies which are contestable are those in which a party, other than that holding the seat, has a reasonable chance of winning the seat. Contestability is defined here as a measure of how likely a seat is to be lost by the party holding that seat at an election.

The probability that a seat is lost is well known to depend most strongly on the 'closeness' of the votes for the various parties which had candidates standing at the previous election (Cornford *et al.*, 1995). More generally, the probability that a seat is lost at a subsequent election can be seen to be strongly influenced by the share of the votes of each contesting party at the general election immediately prior to the new election of interest. Other events, local- or by-elections, are not necessarily as good a guide to contestability.

The aim here is to be able to assign a probability to each constituency which quantifies the likelihood that that constituency could be lost by the incumbent party based on the prior votes of the parties contesting that seat at the previous general election. The context for this calculation is the results of all contests at all general elections in Britain since 1955. This context is used because past precedence is intuitively the best yardstick upon which to calibrate a model of probabilities which is itself aiming to quantify the precedent. The period from 1955 is chosen because the constituencies in which general elections are held have been relatively stable, the boundaries of some of them having being significantly altered only twice since then.

The following procedure is used to assign a probability of changing hands to each seat at each election. It is based upon the concept of the electoral triangle which is described in more detail in the main text. It can be shown that only the main three parties, Conservatives, Labour and Liberals (of various forms) have had a significant effect on the outcome of British general elections since 1955. With just these three parties to work with, each seat can be categorized by the proportion of the vote for the Conservatives and Labour (this in turn defines the proportion of the vote gained by the variously named third party). These two proportions locate a position on the electoral triangle and it is that position which is used to define the prior political position of each seat.

- A dataset is created of all election results by constituency between 1955 and 1992. For each constituency at each election the votes for the Conservative Party, Labour Party and Liberal Party/Alliance/Liberal Democrats are recorded. Between 1955 and 1992 there were two major sets of boundary changes. Previous studies were used to decide whether a seat was substantially the same after the boundary changes, had ceased to exist, or was created - thus simplifying a generally more complex geographical process. The single boundary change prior to the 1992 election, in which an extra seat in Milton Keynes was created, is dealt with in a different way - by combining the new seat with the existing Milton Keynes seat.

The elections of 1955, 1959, 1964, 1966, 1970, 1974 (February and October), 1979, 1983, 1987 and 1992 are included along with the results of the 1979 election as they have been estimated if transferred to the seats defined for the 1983 election (BBC/ITN, 1983). Thus we have a data set of 705 seats for 12 elections and 3 parties - potentially over 25,000 counts of votes for all the individual candidates who represented the three main parties at general elections in this period.

- Each seat at each election is assigned to a 'cell', X,Y, on the electoral triangle defined by the ranges:
 $X\% \leq \text{Conservative share of the three party vote } (\%) < X\% + 1\%$
 $Y\% \leq \text{Labour share of the three party vote } (\%) < Y\% + 1\%$
 $0\% \leq X\% + Y\% \leq 100\%$

where X and Y are integers.

- For each cell, X,Y, in the resulting triangle the following four counts are made:
A: The number of times a seat has existed at two consecutive elections and in which candidates from at least two of the three main parties stood at each election. This is based on all the elections that have occurred between 1955 and 1992 and all the seats on the mainland of Britain.

- B: The number of contests in A where the parties coming first and second at both pairs of elections were drawn from the three main parties.
- C: The number of contests in B where the first-placed party at the first election was not first placed at the second election (that is, seats which changed hands).
- D: The number of contests in C where the first-placed party at the second election was the second-placed party at the first election (that is, seats which changed hands and which were won by the party placed second at the preceding election).

• For each cell in the triangle, the raw probability that seats which have occupied that cell were contestable is defined as:

The ratio D/B taken from the counts described above.

That is, the proportion of all the contests where the main parties played the leading roles and in which the second-placed party at the first election won at the second election – as the main text shows, these represent 99.0 per cent of all contests and 95.2 per cent of seats which have changed hands. The vast majority of contests and changes are thus covered by this definition. The result is a raw probability surface with each cell allocated a value between 0 (no seat occupying that position ever having passed from first-placed party to second-placed party) and 1 (every seat occupying that position having passed from the first party to the second party at successive elections).

- For each cell in the triangle a smoothed probability that seats in that cell will pass to the second party at a successive election is calculated.

The choice of which grid to place over the triangle is arbitrary and has some influence on the resulting raw probability surface. To create a more robust measure of how likely a seat is to be won by the second-placed party at the next election, this raw probability surface is locally smoothed according to the following procedure:

a) The ratio for each cell is taken as D/B only if B is greater than or equal to five (that is, only if the probability is based on at least five previous contests occurring in that cell). If B is less than five, neighbouring cells are taken (beginning with the immediately contiguous cells and moving out in one per cent increments in all directions) until five contests are found. If five contests cannot be found within six one per cent cells of a particular cell on the triangle, then that cell is deemed not to have an estimable probability associated with it. The resulting estimates of probability for all cells which can be estimated are termed the 'robust probability' that a seat will change hands.

b) The smoothed probability is subsequently calculated for every cell on the triangle as a weighted average of the cell's robust probability and the robust probabilities of all its nearest neighbours through simple one-pass binomial smoothing. The cell's smoothed value is taken to be 1/4 of its robust value plus 1/8 of its immediate neighbours' values and 1/16 of its point-wise neighbours in the three-by-three neighbourhood of the cell. These fractions differ at the edges of the triangle and when probabilities could not be defined according to standard practice. The resulting probability for each cell is termed 'smoothed probability'.

- Areas on the triangle were defined as contestable when their smoothed probability was equal to, or greater than, 0.1

To achieve a simple dichotomy between areas of the electoral triangle within which seats were thought to be contestable, and areas in which seats were thought to be 'safe', a cut-off contour had to be chosen on the smoothed probability surface. The level 0.1 was chosen partly to contrast with the different kind of 10 per cent cut-off which is traditionally used in these kinds of studies. More substantively, a 0.1 smoothed probability contour was found to result in largely contiguous areas being defined as contestable (see Figure 3). Further, the 0.1 contour was found to include 88 per cent of those seats which have ever changed hands at elections. The area outside this limit included 99 per cent of seats which did not change hands. This 0.1 probability level is obviously fairly arbitrary. Nevertheless it is thought that this process should result in a more reliable, and certainly a more explicit definition of what is, and what is not, likely to be a 'winnable' constituency.

CONTESTABLE CON
FC
AND INCORP

Margin in
terms of
precedent
probability of
seat changing
hands (%)

Winner
1992

Conservative/Labour Mar

50	Con
44	Con
44	Con
44	Con
35	Con
35	Con
35	Con
35	Con
35	Con
35	Con
35	Con
34	Con
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19	Con
18	Con
18	Con
18	Con
18	Con
17	Con

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at the first election was not first (hands).

at the second election was the changed hands and which were

which have occupied that cell were

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ery cell on the triangle as a probabilities of all its nearest ll's smoothed value is taken to dues and 1/16 of its point-wise fractions differ at the edges of ing to standard practice. The moothed probability was equal

angle within which seats were to be 'safe', a cut-off contour l was chosen partly to contrast used in these kinds of studies. to result in largely contiguous contour was found to include ns. The area outside this limit probability level is obviously result in a more reliable, and ot, likely to be a 'winnable'

APPENDIX 2
CONTESTABLE CONSTITUENCIES AT THE 0.1 OR BETTER PROBABILITY LEVEL
FOLLOWING THE 1992 GENERAL ELECTION
AND INCORPORATING THE MOST RECENT BOUNDARY CHANGES

Margin in terms of precedent probability of seat changing hands (%)	Winner 1992	Runner Up 1992	Constituency	Traditional margin (%)
<i>Conservative/Labour Marginals</i>				
50	Con	Lab	Vale of Glamorgan	0.12
44	Con	Lab	Dudley South	0.28
44	Con	Lab	Acton and Shepherds Bush	0.03
44	Con	Lab	Hayes and Harlington	0.08
35	Con	Lab	Batley and Spen	1.30
35	Con	Lab	Blackpool South	0.50
35	Con	Lab	Corby	0.60
35	Con	Lab	Lincoln	1.17
35	Con	Lab	North West Leicestershire	1.30
35	Con	Lab	Rossendale and Darwen	0.62
34	Con	Lab	Edmonton	1.22
34	Con	Lab	Slough	1.06
34	Con	Lab	Warrington South	2.45
34	Con	Lab	Regents Park and Kensington N	1.29
34	Con	Lab	Vale of Clwyd	2.10
33	Con	Lab	Eltham	1.72
33	Con	Lab	Kingswood	2.54
32	Con	Lab	Amber Valley	2.15
32	Con	Lab	Bury South	1.50
30	Con	Lab	City of Chester	3.87
29	Con	Lab	Southampton Itchen	2.67
29	Con	Lab	Preseli Pembrokeshire	2.99
27	Con	Lab	Brentford and Isleworth	2.00
27	Con	Lab	Croydon North	1.81
27	Con	Lab	Dover	1.44
27	Con	Lab	Middlesbrough S and E Cleveland	1.67
27	Con	Lab	Luton South	1.66
27	Con	Lab	Staffordshire Moorlands	3.57
26	Con	Lab	Ilford South	3.35
26	Con	Lab	Halesowen and Rowley Regis	3.85
25	Con	Lab	Mitcham and Morden	3.43
25	Con	Lab	Tynemouth	5.66
24	Con	Lab	Stevenage	7.17
23	Con	Lab	Norwich North	4.90
23	Con	Lab	Worcester	5.65
21	Con	Lab	Chorley	4.81
21	Con	Lab	South Derbyshire	5.78
19	Con	Lab	Harlow	3.87
18	Con	Lab	Birmingham Hall Green	7.80
18	Con	Lab	Bolton West	5.46
18	Con	Lab	High Peak	7.89
18	Con	Lab	Northampton North	7.65
17	Con	Lab	Exeter	4.92

BRITISH ELECTIONS AND PARTIES

Constituency	Traditional margin (%)
Older Valley	7.99
oucester	8.44
eds North East	8.51
rby North	7.53
rest of Dean	6.17
ughborough	10.29
net	5.57
ighley	6.60
nmouth	6.32
y North	8.03
ckton South	7.29
diff North	6.19
ghton Pavilion	6.79
nouth Sutton	4.83
ldon	10.27
ningham Edgbaston	8.12
ldon South	10.43
l Grove	1.69
berdeenshire and Kincardine	6.41
es	2.87
dge and West Devon	5.41
ourne	8.42
n and Radnorshire	0.27
nouth South	0.45
ord	5.88
Wight	2.28
oort	5.52
enham	10.85
/	10.08
ton and Frome	7.10
ck	2.14
s	0.92
gham Northfield	1.11
1	0.50
North East	2.78
1 and Heston	2.01
am East	2.61
Varwickshire	2.50
y South	0.73
ham Selly Oak	3.70
	0.77
re Port and Neston	5.34
n	4.42

CROOKED MARGINS AND MARGINAL SEATS

Margin in terms of precededented probability of seat changing hands (%)	Winner 1992	Runner Up 1992	Constituency	Traditional margin (%)
<i>Labour/Conservative Marginals (continued)</i>				
42	Lab	Con	Lewisham West	4.17
42	Lab	Con	Sherwood	4.73
40	Lab	Con	West Lancashire	3.79
39	Lab	Con	Bristol North West	0.46
39	Lab	Con	Nuneaton	2.78
39	Lab	Con	Carmarthen W & S Pembrokeshire	2.93
36	Lab	Con	Barrow and Furness	6.49
36	Lab	Con	Copeland	5.19
36	Lab	Con	Darlington	5.08
36	Lab	Con	Nottingham South	5.94
36	Lab	Con	Wakefield	6.44
35	Lab	Con	Delyn	6.41
30	Lab	Con	Hampstead and Highgate	5.15
29	Lab	Con	Carlisle	2.13
29	Lab	Con	Cannock Chase	7.88
29	Lab	Con	Southampton Test	3.88
29	Lab	Con	Walsall South	6.29
29	Lab	Con	Ayr	4.89
27	Lab	Con	Pendle	4.02
27	Lab	Con	Weaver Vale	4.80
26	Lab	Con	Dewsbury	7.33
25	Lab	Con	Dudley North	9.19
25	Lab	Con	Dulwich and West Norwood	6.51
25	Lab	Con	Hornsey and Wood Green	9.39
25	Lab	Con	Stretford and Urmston	7.29
25	Lab	Con	Strathkelvin and Bearsden	8.01
23	Lab	Con	Streatham	9.94
23	Lab	Con	Wolverhampton North East	7.97
23	Lab	Con	City of York	9.82
22	Lab	Con	Derby South	10.56
22	Lab	Con	Wallasey	7.00
22	Lab	Con	Walthamstow	5.41
21	Lab	Con	Tooting	8.09
21	Lab	Con	Cunninghame North	6.82
20	Lab	Con	Plymouth Devonport	10.27
20	Lab	Con	Edinburgh South	9.40
19	Lab	Con	Blackburn	10.98
19	Lab	Con	Coventry North West	10.53
17	Lab	Con	North East Derbyshire	10.62
17	Lab	Con	Cambridge	1.08
17	Lab	Con	Edinburgh Central	5.94
15	Lab	Con	Morley and Rothwell	12.08
15	Lab	Con	Bradford South	9.29
15	Lab	Con	Bristol East	6.89
15	Lab	Con	Crewe and Nantwich	7.20
15	Lab	Con	Leicester West	8.21
15	Lab	Con	Norwich South	8.10
15	Lab	Con	Stockport	8.09

Margin in terms of precedent probability of seat changing hands (%)	Winner 1992	Runner Up 1992	Constituency	Traditional margin (%)
<i>Labour/Conservative Marginals (continued)</i>				
15	Lab	Con	Walsall North	7.34
15	Lab	Con	West Bromwich East	8.12
14	Lab	Con	Southall	10.60
12	Lab	Con	Great Grimsby	14.80
12	Lab	Con	Wythenshawe and Sale East	14.34
12	Lab	Con	Stoke South	13.07
11	Lab	Con	Birmingham Erdington 1	6.70
11	Lab	Con	Wrexham	15.84
11	Lab	Con	West Renfrewshire	13.77
10	Lab	Con	Bassetlaw	18.19
10	Lab	Con	Leicester South	17.70
10	Lab	Con	Telford	13.45
<i>Labour/Democrat Marginal</i>				
20	Lab	LDp	Greenwich and Woolwich	6.80
<i>Democrat/Conservative Marginals</i>				
35	LDp	Con	Bath	3.85
28	LDp	Con	North East Fife	7.89
22	LDp	Con	Argyll and Bute	7.19
21	LDp	Con	Cheltenham	3.72
19	LDp	Con	North Cornwall	3.07
15	LDp	Con	Berwick upon Tweed	11.59
14	LDp	Con	North Devon	1.39
13	LDp	Con	Tweeddale Ettrick and Lauderdale	2.86
<i>Democrat/Labour Marginal</i>				
18	LDp	Lab	Rochdale	1.31
<i>Democrat/Nationalist Marginal</i>				
16	LDp	Nat	Inverness East Nairn and Lochaber	1.72
<i>Nationalist/Democrat Marginal</i>				
12	Nat	LDp	Ceredigion	6.92

A Question Regression on F

The economic and political circumstances of the 1992 general election apparently owed their prosperity (see Sander 1993, 1995; Heath *et al.* beneficiaries of the hostility to the Conservatives of northern Britain and Pattie, 1989, 1990; Pattie, *et al.*, 1995).

The 1992 election circumstances. The impact upon the hit sector and the south (Pattie, *et al.*, 1995) optimism and threaten government.

Clearly then, the Conservatives were re Commons, presenting unprecedented in this narrowed significantly of the geography of the failed to prompt enough government.

Many efforts have been made but it is a major counter election event itself in opinion which contradicts aggregate-level studies change over the long-term victory in 1992.