Sectional Differences in Partisan Bias and Electoral Responsiveness in US House Elections, 1850-1980

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In this Note we challenge the claim asserted in a 1984 *Wall Street Journal* editorial that partisan gerrymandering by Democratic-controlled state legislatures is the principal reason for the inability of Republicans to translate their national share of votes proportionally into seats in the US House of Representatives. In contrast to previous work, we show the critical importance of sectional (South/non-South) differences for understanding the dynamics of electoral change at the congressional level. We argue that the inability of Republicans to translate votes effectively into congressional seats is largely a product of wasted Republican votes in the South, although we recognize that a handful of states (e.g., California) are significantly gerrymandered against Republicans, and we also recognize that part of the reason for the present-day Democratic advantage in the House is an incumbency advantage that benefits the party that controls most seats.[1]

We describe two basic features of US congressional competition for the period 1850–1980, partisan bias and electoral swing, showing the changing shape of political competition for House seats.[2] We focus on swing ratio and bias since between them they capture the critical aspects of seats–votes relationships. We use the Democratic share of the two-party vote because the Democratic party ran candidates in over 98 per

[1] The relationship between the decline in competitive seats and the rise in incumbency advantage is not, however, as straightforward as it might at first seem, insofar as there is evidence that the *likelihood of incumbent defeat* can rise even if the *average margin of victory* for incumbents is rising, and conversely. Probability of incumbent defeat is affected by electoral volatility, among other factors (see G. C. Jacobson, 'Strategic Politicians and the Dynamics of House Elections' (paper presented at the annual meeting of the American Political Science Association, Washington, DC, 1988); cf. S. Ansolabehere, S. Brady and M. Fiorina, 'The Marginals Never Vanished?' (unpublished manuscript, Stanford University Graduate School of Business, 1988). The discussion in this Note does not directly address the incumbency advantage issue (see the references cited above and Gary King and Andrew Gelman, 'Systematic Consequences of Incumbency Advantage in US House Elections' (unpublished manuscript, Department of Government, Harvard University, 1989).

[2] In the nineteenth century some House members were elected from multi-member districts which could distort the results. We ran the data both ways, excluding and including these districts, and there was no significant difference. The results reported exclude multi-member districts.

cent of all districts over the entire time-period.[3] The data set has been generated by one of the present authors by comparing data in a variety of data sets in an attempt to eliminate coding errors.[4]

SWING RATIO

Let us first turn to one of the most important features of the seats–votes relationship, the *swing ratio*. It is the basic measure of electoral responsiveness and there are a number of different ways to calculate it.[5] The swing ratio is simply the expected percentage point change in a party's seat share for a one percentage point change in its candidate's mean vote share across all constituencies. Another way of thinking about the swing ratio is as the value of the tangent to the seats–votes curve at some given point, customarily at the vote share value of 0·5. It is also possible to calculate mean swing ratio across some set of points (e.g., the set of vote values which comprise the expected range of inter-party competition).

Following Tufte,[6] to find the swing ratio, we fit a logit regression of the form:

$$\log_e\left(\frac{S}{1-S}\right) = \beta \log_e\left(\frac{V}{1-V}\right) + a + \epsilon \tag{1}$$

where S is the (hypothetical) Democratic (two-party) seat share in the legislature elected in a given election, V is the (hypothetical) Democratic (two-party) vote share in that election and β is taken as our measure of the swing ratio, a is related to bias as shown in Equation 2 below, and ϵ is a stochastic error term assumed to be of mean zero.[7]

Both S and V are measured as proportions, i.e., fractions between 0 and 1. The estimated values of V and S are taken from a seats–votes curve derived by the method

[3] In general, constituencies are larger than clusters of voters; that is, districts contain more than one socially homogeneous area.

[4] The competitiveness of Northern congressional elections falls most after the period of Wilsonian progressivism, and House elections continue less competitive through the periods of Republican control and Democratic New Deal dominance; competition declines again after the 1958 Democratic landslide, and there is a further decline in the 1960s (data omitted). See D. Brady, *Critical Elections and Congressional Policy Making* (Stanford, Calif.: Stanford University Press, 1988) for further details.

[5] E. R. Tufte, 'The Relationship Between Seats and Votes in Two-Party Systems', *American Political Science Review*, 67 (1973), 540–7; B. Grofman, 'Declarations in *Badham* v. *Eu*' (excerpts), *Political Science* (1985), 544–9, 573–4; R. G. Niemi and P. Fett, 'The Swing Ratio: An Explanation and Assessment', *Legislative Studies Quarterly*, 11 (1986), 75–90.

[6] Tufte, 'The Relationship Between Seats and Votes in Two-Party Systems'; see also J. Campagna and B. Grofman, 'The Effects of Partisan Control of the Redistricting Process on Partisan Bias in 1980s Congressional Districting', *Journal of Politics* (forthcoming, 1990).

[7] Alternative logit or bilogit specifications are given in W. J. Linehan and P. Schrodt, 'A New Test of the Cube Law', *Political Methodology*, 4 (1978), 353–67; R. X. Browning and G. King, 'Seats, Votes, and Gerrymandering: Estimating Representation and Bias in State Legislative Redistricting', *Law and Policy*, 9 (1987), 305–22; G. King and R. X. Browning. 'Democratic Representation and Partisan Bias in Congressional Elections', *American Political Science Review*, 81 (1987), 1251–73; and G. King, 'Representation Through Legislative Redistricting: A Stochastic Model', *American Journal of Political Science*, 33 (1989), 787–824. The link between the procedure we use and the bilogit formula of King and his colleagues is discussed in Campagna and Grofman, 'The Effects of Partisan Control of the Redistricting Process'.

suggested by Butler.[8] That is, for each election, we calculate the increase in seats for each percentage point increase or decrease in the Democrats' vote share, across a range of vote shares near 50 per cent. We used a value of ± 10 points from the mean; i.e., the mean gets shifted down 10 points at a time and then up 10 points at a time. This gives us 20 points reflecting the actual election results but under the assumption that there had been 20 one-point shifts (a stochastic variant of this procedure is given by King).[9] On balance, we share the view of Niemi and Fett[10] that the Butler method for generating the seats–votes curves is to be preferred to the more commonly used method of one data-point per election used by Dahl, March and most political geographers,[11] because it generates sufficient data points for effective statistical modelling and because it allows us to see how the swing ratio (and bias) change from election to election.

The most important fact to understand about the swing ratio is that when the swing ratio is high, small changes in votes can translate into large changes in seats and, conversely, when the swing ratio is low, even large changes in votes may have little effect on the composition of a legislature. Thus, the nature of the partisan distribution of voting strength can either mask or exaggerate the strength of national electoral tides.[12]

The swing ratio has to do with the rate at which changes in votes get translated into seats; the bias has to do with asymmetries in the way the seats–votes curve treats the two parties.

PARTISAN BIAS

The bias in a seats–votes curve has been differently defined by different authors.[13] We, like Tufte[14] and Niemi and Deegan,[15] shall use the term *bias* to refer to the difference between the seat share that the Democratic party could have expected and the seat share the Republican (or Whig) party could have expected to get had each party received exactly 50 per cent of the *national* two-party vote. If bias is zero, each party is equally efficient in translating its votes into seats. If bias is positive, then Democratic vote strength is more efficiently distributed than that of its rival party.

[8] D. Butler, *The Electoral System in Britain 1918–1951* (London: Oxford University Press, 1953).

[9] G. King, 'Measuring Political Gerrymandering' (unpublished manuscript, Department of Government, Harvard University, 1989).

[10] R. G. Niemi and P. Fett, 'The Swing Ratio: An Explanation and Assessment', *Legislative Studies Quarterly*, 11 (1986), 75–90.

[11] R. A. Dahl, *A Preface to Democratic Theory* (Chicago: University of Chicago Press, 1956); J. D. March, 'Party Legislative Representation as a Function of Election Results', *Public Opinion Quarterly*, 21 (1957), 521–42.

[12] See especially Brady, *Critical Elections and Congressional Policy Making*; B. N. Grofman, 'For Single-Member Districts, Random is Not Equal', in Bernard Grofman, Arend Lijphart, Robert McKay and Howard Scarrow, eds, *Representation and Redistricting Issues* (Lexington, Mass.: Lexington Books, 1982), pp. 55–8; G. Gudgin and P. J. Taylor, *Seats, Votes and the Spatial Organisation of Elections* (London: Pion, 1979); R. J. Johnston, *Political, Electoral and Spatial Systems: An Essay in Political Geography* (Oxford: Clarendon Press, 1979).

[13] See review in B. N. Grofman, 'Measures of Bias and Proportionality in Seats–Votes Relationships', *Political Methodology*, 9 (1983), 295–327.

[14] Tufte, 'The Relationship Between Seats and Votes in Two-Party Systems'.

[15] R. G. Niemi and J. Deegan, Jr, 'A Theory of Political Districting: Responsiveness and the Swing Ratio', *American Political Science Review*, 72 (1978), 1304–23.

We calculated bias from the expression given in Equation 2 (we neglect the stochastic error term in the calculations following):

$$\log_e\left(\frac{S}{1-S}\right) = B\log_e\left(\frac{V}{1-V}\right) + a. \tag{2}$$

When

$$V = 0.5, \log_e\left(\frac{V}{1-V}\right) = 0.$$

Thus

$$a = \log_e\left(\frac{S}{1-S}\right),$$

or

$$e^a = \left(\frac{S}{1-S}\right),$$

or

$$S = \left(\frac{e^a}{e^a+1}\right)$$

Thus, at $V = 0.5$, since S should be 0.5 if there were zero bias, bias is given by:

$$\left(\frac{e^a}{e^a+1}\right) - 0.5.$$

For example, if $a = 0.24$, as in 1850, then bias is given by $(1.27/2.27) - 0.5 = 0.059$.

In general, the bias will be high when the mean and the median of the distribution of partisan voting strength across constituencies do not coincide (Gudgin and Taylor; Johnston).[16] A measure of this discrepancy is the skewness of the distribution. For a distribution whose mean is in the competitive range, in general, positive skew will produce a negative bias. In other words, if the Democratic party's vote strength is too concentrated, they will not get as many seats per vote as the Republicans will, and in particular they will not do as well as the Republicans when both get a 50 per cent vote share.

NATIONAL TRENDS

Table 1 shows actual competitive seat proportions (i.e., proportions of seats won by a 45–55 per cent share of the two-party vote), as well as our estimated swing ratio and bias figures for all congressional elections in the period 1850–1980.

The swing ratio has rapidly declined since 1900; its decline moves largely in parallel with the decline in the number of competitive seats also shown in Table 1, to which attention has been called by a number of scholars.[17] Prior to 1900, the swing ratio averaged around 4; after 1900 it fell below 3 and after 1966 it fell below 2.

Bias is in principle independent of swing ratio or proportion of competitive seats, even if empirically these variables may be correlated. It is important to distinguish these two features of seats–votes relationships. For example, bias was identical in 1854

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[16] Gudgin and Taylor, *Seats, Votes and the Spatial Organisation of Elections*; Johnston, *Political, Electoral and Spatial Systems*, pp. 63–6.

[17] E.g., D. Gross and J. C. Garand, 'Changes in the Vote Margins for Congressional Candidates: A Specification of Historical Trends', *American Political Science Review*, 78 (1989), 17–31.

and 1976; yet the swing ratio in the former was 3·2 and in the latter 1·6. Similarly, the swing ratio was identical in 1904 and 1974; yet the bias in these years was very different. Over the whole period, bias is essentially uncorrelated with the swing ratio ($r = 0·13$) or with the proportion of competitive seats ($r = 0·01$).

Bias was negative just before the Civil War, became positive during the war period and became negative again in 1876, remaining that way until 1920. After 1920, the pattern of bias was irregular, but recently the national bias has favoured the Democrats. A fuller analysis of the implications of swing ratio and bias, however, requires disaggregating our data by region.

SECTIONAL EFFECTS ON THE SWING RATIO

The distribution of partisan voting strength across constituencies depends on how voters are spatially clustered.[18] In order to account for the historical decline in political competition and swing we look to South/non-South differences, where we take the South to be the eleven states of the Confederacy.

The South

The post-1900 drop in the degree of political competition (and thus the swing ratio) was undoubtedly the result of the Southern states' use of poll taxes, white primaries and other similar structural devices to inhibit formation of a Republican coalition based on poor white and black voters. The Populist movement in the 1892–98 period had in fact generated exactly such a threat to Democratic dominance in the South.[19] The response of the white Democratic elite was to pass a series of structural reforms which effectively eliminated black voters and greatly reduced the number of poor whites voting, thus assuring Democratic dominance of Southern elections.

In Georgia and Louisiana, for example, voter turnout in the elections from 1892 through 1896 averaged over 18,000 votes per constituency. In contrast, voter turnout in the 1900 through 1906 elections was less than 4,000 votes per constituency, a drop-off of over 80 per cent. The average margin of victory in the 1892 through 1896 period was slightly over 60 per cent, while the comparable figure for the 1900 to 1906 period was over 90 per cent. Although the Southern districts are only roughly a quarter of all congressional districts, the effect of this dramatic decrease in Southern political competition after 1900 is visible in the national swing ratio which falls below 3 for the first time in 1902.

Indeed, the South has been so non-competitive that until quite recently almost all major changes in the composition of Congress since the 1890s had occurred as a result of changes in voting behaviour outside the South.

[18] See especially Gudgin and Taylor, *Seats, Votes and the Spatial Organisation of Elections*, pp. 36ff.

[19] J. D. Hicks, *The Populist Revolt: A History of the Farmers' Alliance and the People's Party* (Minneapolis: University of Minnesota Press, 1931); P. H. Argersinger, *Populism and Politics: William Alfred Peffer and the People's Party* (Lexington: University of Kentucky Press, 1974).

TABLE 1   *Congressional Election Competitiveness Measures: Whole Nation*

Year	Congress	Swing ratio	Per cent competitive seats	Bias
1850	32	5·2	59·4	0·059
1852	33	4·1	48·1	0·084
1854	34	3·2	30·4	0·047
1856	35	3·9	37·4	0·032
1858	36	3·8	37·8	−0·060
1860	37	3·9	39·2	−0·022
1862	38	4·2	40·7	0·079
1864	39	4·5	32·0	0·070
1866	40	4·2	35·3	0·053
1868	41	4·4	41·0	0·037
1870	42	4·4	42·1	0·050
1872	43	4·2	40·6	0·032
1874	44	4·2	40·1	0·023
1876	45	4·2	41·5	−0·028
1878	46	3·0	28·0	−0·002
1880	47	4·2	43·3	−0·014
1882	48	4·3	44·4	0
1884	49	4·1	40·5	−0·067
1886	50	3·1	37·8	−0·132
1888	51	4·3	43·1	−0·074
1890	52	3·7	41·9	−0·081
1892	53	4·2	34·0	−0·047
1894	54	3·2	23·2	−0·025
1896	55	3·6	34·5	−0·028
1898	56	3·5	33·0	0·012
1900	57	3·1	29·7	0·010
1902	58	2·4	24·3	−0·052
1904	59	1·9	18·0	−0·089
1906	60	2·4	23·6	−0·062
1908	61	2·7	27·0	−0·108
1910	62	3·2	36·3	−0·057
1912	63	2·3	23·8	−0·103
1914	64	2·1	21·3	−0·103
1916	65	2·9	29·2	−0·067
1918	66	2·2	22·1	−0·007
1920	67	1·9	15·3	−0·055
1922	68	2·3	23·6	0·042
1924	69	1·7	15·5	−0·012
1926	70	1·5	10·6	0·025
1928	71	2·0	19·6	−0·057
1930	72	2·1	20·4	0·052
1932	73	2·8	30·9	−0·017
1934	74	2·7	28·4	−0·015
1936	75	2·8	24·4	0·027
1938	76	2·2	24·5	0·022

TABLE 1   (*Cont.*)

Year	Congress	Swing ratio	Per cent competitive seats	Bias
1940	77	2·5	23·1	0·020
1942	78	1·9	18·7	−0·005
1944	79	2·2	21·4	0·012
1946	80	1·9	19·4	−0·025
1948	81	2·5	26·5	0·047
1950	82	1·9	20·6	−0·028
1952	83	2·0	19·1	0·042
1954	84	2·1	20·0	0·010
1956	85	2·1	20·7	−0·010
1958	86	2·1	23·8	0·012
1960	87	2·1	19·2	0·010
1962	88	2·1	17·4	−0·005
1964	89	2·3	25·1	−0·015
1966	90	1·7	16·8	−0·052
1968	91	1·7	15·5	0·007
1970	92	1·3	10·8	0·040
1972	93	1·4	11·7	0·020
1974	94	1·9	20·6	0·030
1976	95	1·6	15·5	0·047
1978	96	1·6	14·8	−0·001
1980	97	1·5	15·7	0·008

The Non-South

If we drop the Southern states from the analysis, we can ascertain the extent to which Southern states influenced the swing ratio results shown in Table 1. Table 2 shows the partisan bias and swing figures for the non-Southern states from 1850 to 1980.

The non-Southern swing ratio follows roughly the same pattern as the nation as a whole but is consistently higher. From 1850 to 1900 the non-Southern swing ratio averaged close to 5, nearly a point above the comparable national figure. In 1902 the ratio fell to 4·0, when the national swing ratio was only 2·4. In this century, the non-South swing ratio, like the national swing ratio, has exhibited a general downward trend, but it was not until 1924 that it first fell below 3. There was a slight upturn during the first three New Deal elections and a fall thereafter. In the mid-1960s the non-Southern swing ratio fell below 2·0 at the same time as the national swing ratio did. In comparing the non-Southern pattern to the national pattern, we infer lower competitiveness in the South than in the non-South over most of the 130 years from 1950 to 1980,[20] but we see the swing ratio gap between South and non-South steadily narrowing and

[20] The competitiveness of Northern congressional elections fell most after the period of Wilsonian progressivism, and the House elections continued to be less competitive through the periods of Republican control and Democratic New Deal dominance. Competition declined again after the 1958 Democratic landslide, and there was a further decline in the 1960s (data omitted).

TABLE 2   *Congressional Election Competitiveness Measures: Non-Southern*
States

Year	Congress	Swing	Bias
1850	32	5·5	0·046
1852	33	5·5	0·070
1854	34	3·7	0·082
1856	35	4·3	0·024
1858	36	4·9	−0·017
1860	37	4·8	0·040
1862	38	4·3	0·051
1864	39	4·6	0·055
1866	40	4·2	0·002
1868	41	4·4	0·002
1870	42	4·8	0·027
1872	43	4·5	−0·017
1874	44	4·6	0·056
1876	45	4·8	−0·013
1878	46	3·4	0·021
1880	47	5·1	0·002
1882	48	4·9	0·032
1884	49	5·3	−0·043
1886	50	4·7	−0·075
1888	51	5·7	0·009
1890	52	5·0	−0·035
1892	53	5·4	0·018
1894	54	5·1	0
1896	55	5·0	0·017
1898	56	4·8	0·002
1900	57	4·8	−0·002
1902	58	4·0	0·030
1904	59	3·6	0·028
1906	60	4·0	0·026
1908	61	4·6	0·011
1910	62	4·6	0·033
1912	63	3·8	−0·009
1914	64	3·4	−0·008
1916	65	4·0	0·022
1918	66	3·2	0·005
1920	67	3·3	0·025
1922	68	3·2	0·044
1924	69	2·5	−0·042
1926	70	2·2	−0·057
1928	71	2·9	−0·036
1930	72	2·7	−0·036
1932	73	3·8	−0·058
1934	74	3·7	0·031
1936	75	3·5	−0·003
1938	76	2·9	−0·022

TABLE 2   (*Cont.*)

Year	Congress	Swing	Bias
1940	77	3·3	−0·017
1942	78	3·0	0·036
1944	79	3·0	−0·038
1946	80	3·1	−0·063
1948	81	3·3	−0·018
1950	82	2·7	−0·066
1952	83	2·7	−0·050
1954	84	2·7	−0·084
1956	85	2·8	−0·058
1958	86	2·6	−0·065
1960	87	2·6	−0·026
1962	88	2·3	−0·026
1964	89	2·5	−0·058
1966	90	1·9	−0·010
1968	91	1·8	−0·014
1970	92	1·5	−0·008
1972	93	1·5	−0·004
1974	94	1·9	−0·027
1976	95	1·7	−0·005
1978	96	1·6	−0·004
1980	97	1·7	−0·011

effectively disappearing by the 1970s. We believe that in part this is due to black enfranchisement and to redistricting changes in the South caused by the Voting Rights Act which made electoral competition in the South more closely resemble the national pattern.[21]

SECTIONAL EFFECTS ON ELECTORAL BIAS

When we introduce a regional control for bias, we get a very different picture from that presented earlier for the nation as a whole. The results clearly show how regional patterns affect bias (see Table 2). In the 1850s, when there were two *nationally* competitive parties, bias in the non-Southern states was similar to bias in the nation as a whole. In the 1870s the bias figures for the non-South began to diverge from those of the whole nation, even including sign differences. By the 1890s the bias differences were very large, with non-Southern states showing a pro-Republican bias (negative bias equals anti-Democratic bias), while the bias figures for the nation showed a pro-Democratic bias. In the 1920 to 1980 period, the non-South, in general, showed a pro-Republican bias while the whole nation generally showed a pro-Democratic bias. However, by the late 1970s, bias in both the non-South and the nation as a whole was very low.

King and Gelman have produced a time series of electoral responsiveness and bias

[21] Cf. B. Grofman and L. Handley, 'The Effect of the Voting Rights Act on Black Success in Southern State Legislature and Congressional Districts' (paper presented at the National Science Foundation Conference on the Voting Rights Act, Rice University, Houston, 1990).

figures for the period 1946–86 directly comparable to those shown in our Tables 1 and 2, albeit generated by slightly different methods.[22] For the years of overlap, their responsiveness estimates are *very* similar to ours but there are some important differences in bias estimates. However, with respect to a central point of this note – that up to 1980 there are critical differences between non-Southern and national estimates of bias such that pro-Democratic bias largely disappears if we exclude the South – King and Gelman have similar findings, although they show a very slight pro-Democratic bias in a few years in which we found a very slight pro-Republican bias.[23] The discrepancy appears to be partly due to differences in the treatment of uncontested seats and in the range of hypothetical vote shares over which estimates are generated.

CONCLUSION

Our principal empirical findings may be summarized as follows:

(1) Nationally, the swing ratio has been falling steadily since the turn of the century, but the decline occurred earlier in the South than in the non-South. However, the gap between the South and non-South in swing ratio has narrowed sharply and currently is almost nil.

(2) Partisan bias throughout most of the past 110 years has been very different in the non-South from in the nation as a whole. Any pro-Democratic bias in the national seats–votes data disappears if we look at the non-South alone.[24]

Our results for bias disaggregated by region can be used to provide important insights into the question of whether or not the House is constitutionally Democratic as a result of political gerrymandering, as some Republican leaders have recently alleged. Save for a few exeptional states (e.g., California), it appears to be the existence of Southern constituencies with entrenched Democratic incumbents where Republican votes fail to translate into Republican seats which generates a high pro-Democratic bias for the country as a whole.[25]

[22] King and Gelman, 'Systematic Consequences of Incumbency Advantage in US House Elections'.

[23] King and Gelman, 'Systematic Consequences of Incumbency Advantage', Figure 9.

[24] However, pro-Democratic bias in particular states (e.g., California) might become invisible when we look at data aggregated to the regional level (see B. Grofman, 'Declarations in *Badham* v. *Eu* (excerpts)'; B. Grofman and H. Scarrow, 'Current Issues in Reapportionment', *Law and Policy Quarterly*, 4 (1982), 435–74; G. Owen and B. Grofman, 'Optimal Partisan Gerrymandering', *Political Geography Quarterly*, 7 (1988), 5–22). A state-level analysis of seats–votes relationships is a topic which must, however, be left to a subsequent paper. Disaggregated analyses of the sort that we regard as appropriate are found in B. Cain, 'Assessing the Partisan Effects of Redistricting', *American Political Science Review*, 79 (1985), 320–33, for California congressional seats; and in A. Glazer, B. Grofman and M. Robbins, 'Partisan and Incumbency Effects of 1970's Congressional Redistricting', *American Journal of Political Science*, 30 (1987), 680–701, for congressional redistricting in the 1970s.

[25] King and Gelman's innovative but unpublished paper, 'Systematic Consequences of Incumbency Advantage', seeks to disentangle the issue of partisan bias from the question of incumbency advantage.