Partisan bias and redistricting in France

Nicolas Sauger [a, *], Bernard Grofman [b]

[a] *Sciences Po, Centre for European Studies (CEE) and LIEPP (ANR-11-LABX-0091, ANR-11-IDEX-005-02), CNRS, 75007 Paris, France*
[b] *Center for the Study of Democracy, University of California, Irvine, USA*

ARTICLE INFO

ABSTRACT

Decided by the executive, redistrictings in France have been claimed to have substantial partisan bias in favor of the right. We examine the evidence for this claim in terms of France's left bloc versus right bloc politics, combining information from both the first and the second round of France's two round electoral system. We also examine data at the constituency level to look at factors, such as malapportionment, that can affect bias. As France is characterized by a pattern of a limited number of redistrictings, population inequalities have grown in legislative constituencies between plans. Although the procedures used to draw constituency boundaries for the French Assembly are rather opaque, and under the control of political authorities, partisan bias appears as minuscule.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Redistricting plans are often providing opportunities for debates about the intentions of those who draw the new maps. It is especially the case when these plans are elaborated in a partisan process. France is such a case. In the past decades, redistricting plans have been decided under the strong leadership of the executive branch. This has led, as elsewhere, to strong accusations of unfairness in the new map. Because all plans have been decided under right-wing governments, there have been strong suspicions that a bias in favor of the right exists. This paper assesses the importance of this bias.

We study French redistricting for the National Assembly over the six elections held during the period 1988—2012. We have three central concerns: (1) measuring *malapportionment*[1] in each of the elections and considering over time changes, (2) measuring total *partisan bias*[2] in outcomes in each of the elections and considering over time changes, and (3) evaluating the impact of various factors that may affect partisan bias, especially malapportionment. We look at data both at the level of departments and at the level of districts.[3]

France is a useful case in which to study the link between malapportionment and partisan advantage. First redistricting plans in France have been very infrequent. During the more than five decades of the Fifth Republic, France has had only three censuses leading to redistricting[4]: One linked to the initial district plan in 1958, then one in 1986 (see Ponceyri, 1988; Gaudillère, 1995; Balinksi, 2008) and, most recently, in 2009. Second, France has used the Adams method for apportionment. Of the set of standard apportionment methods,[5] the Adams method can be shown to be the one most favorable to small units by assuring even the smallest of them at least one seat. Third, as we discuss in more detail below for the case of the 2012 redistricting, malapportionment in France at the constituency level is only partially constrained by constitutional rules. The combination of these factors creates the potential for malapportionment with partisan consequences.

---

* Corresponding author. Sciences Po, CEE, 27 Rue Saint Guillaume, F-75337 Paris Cedex 07, France.
   E-mail address: nicolas.sauger@sciencespo.fr (N. Sauger).

[1] *Malapportionment* has to do with discrepancies between the population of a given district or grouping and the number (proportion) of seats in the legislature it is awarded.

[2] *Partisan bias* is a measure of the degree of (hypothetical) symmetry of treatment of the vote shares of different parties or party blocs as they are reflected in seat shares (Tufte, 1973; Grofman, 1983; Gelman and King, 1994).

[3] We offer analyses at both the department and the constituency level since it is quite possible for the level of malapportionment, and/or the nature of its partisan consequences, to be quite different at the two levels.

[4] Minor changes in the district plan were done in 1964 to adapt to the new configuration of departments in the Paris region.

[5] There are six basic rounding methods for apportionment, each of which can be shown to have an equivalent PR method for the allocation of seat shares proportional to vote shares (Balinski and Young, 1982; Pennisi, 1998; Grilli di Cortona et al., 1999, Table 6.3, p. 101).

In sum, France seems to represent a favorable locus for the creation of partisan bias linked to redistricting. Moreover, because redistricting always happened under conservative majorities in the Fifth Republic, its benefits have been generally asserted to have accrued to the right. And the same claim has been made of the 2009 redistricting. In an editorial in the French newspaper *Le Monde* the conclusion was unequivocal: 'This [the 2009] redistricting has one consequence: the left will need even more votes to secure a majority of *députés*.'[6] After the 2012 election, the claim that the 2009 apportionment served to benefit the right was taken to be confirmed by the evidence, although initial academic assessment on this topic provide more mixed results (Dubois, 2014).

The next section of the paper introduces the basic framework for redistricting in France and discusses the methodological issues involved in dealing with two salient characteristics of French electoral competition: a multi-party system and a two-round run-off electoral system. The next section provides summary data on malapportionment for each of our set of six elections. In the following section, we turn to measuring partisan bias in terms of French left bloc versus right bloc politics, and we seek to calculate the extent to which bias can be attributed to malapportionment.

2. Context, methods, and data

This section introduces some important considerations that fundamentally affect our subsequent analyses. First, we describe the general process of redistricting in France, with a focus on the last redistricting. Second, we look at two important characteristics – the existence of more than two parties and the two-round electoral system – and explain how we deal with them in the analyses of malapportionment and bias presented in the paper.

2.1. The redistricting process

As noted above, in France, we may think of redistricting as a two-step procedure. First, seats have to be allocated to geographically defined administrative units. In France, going back at least as far as the 3rd Republic, a divisor rule, called '*méthode de la tranche*' (called the Adams rule in the U.S.) is used to allocate seats to departments. Second, within departments, single seat constituencies require that their boundaries be specified, and that rules be laid down about the degree of population equality needed across them (Handley and Grofman, 2008). In France, the basis of apportionment and of evaluating population equality is namely persons (residents),[7] rather than citizen population, registered voters, or something else.

The 2009 redistricting plan was the first in France's history to be introduced without a significant change in the electoral system. The 1985 election law (85–690 of July 10, 1985) switched the electoral system from a runoff to a proportional system; it required redistricting after each general census. The law (86–825) that brought the return of the runoff system in 1986 provided for mandatory redistricting to be conducted after each second general census. The districting map of 1986 was based on the census of 1982. Results of general censuses were published in 1990 and 1999, but it was only on the basis of the third census, that of 2006 (with results published in 2009) that a post-1986 redistricting plan was created.

This failure to follow the law requiring redistricting after two censuses, and the perceived population inequalities that resulted

from this failure, caused protest. In particular, the Constitutional Council in its 'comments' on the legislative elections of 2002 issued its first warning to the Government about the malapportionment issue. The Constitutional Council asserted that growing disparities in demographic weight of districts was going against constitutional principles. It reiterated this warning more urgently in 2005, looking ahead to the elections of 2007 (Conseil Constitutionnel, Decision, 2005–22 July 7, 2005). The decision to finally reapportion in 2009, however, can be attributed in large part to reasons other than a perceived need to follow the legal mandate for post-censal redistricting after each second census. The 2008 constitutional reform introduced by the government elected in 2007 places a ceiling on maximum assembly size of 577 –the size it had been since 1986 – and also required the creation of eleven new seats designated for French citizens living abroad.[8] Since the imposition of both requirements could not be done while preserving the existing seat allocations, a new apportionment was a necessity.

Although debates within Parliament were heated, both about the procedure to be followed in devising a new redistricting and then about the plan itself, in 2009, both Chambers of Parliament approved a proposal to delegate redistricting to the Government, with the Ministry of Interior in charge; and then they approved the ratification of the subsequent ordinance. As expected, since the line drawing was being done by the Gaullists, left parties opposed both the delegation of power and, ultimately, the plan.

Redistricting in France had long been a business almost entirely for the executive, though there was also review by the Constitutional Council. However, the 2008 constitutional reform (article 25) introduced a new element, an 'independent commission,' the Consultative Council, which is to review and publish a public statement on any redistricting bill,[9] although the opinion is only advisory.

In 2009, as in the previous line drawing of 1986, the line drawers were forced to be attentive to key decisions by the Constitutional Council so that the districts that were created followed some general principles made mandatory by law/constitutional jurisprudence. The initial plan went through various revisions, some forced by decisions of the Constitutional Council, others responsive to objections from the newly created Consultative Council.

The Consultative Council's report on the draft plan gave suggestions for changes in roughly half of the departments. The government followed a majority of the Consultative Council's recommendations about amendments to the plan. The formal process started in September 2008, and concluded with adoption of a final plan in January 2010, and its acceptance as constitutional by the Constitutional Council in February 2010 (see most important dates in the chronology found in the Appendix).[10]

There were various important continuities between the 2009 plan and the 1986 plan, including continuity in use of the two round ballot in single seat constituencies, and continuity in the

---

[6] *Le Monde*, October 20, 2009.

[7] The attempt to generate some seat allocations on the basis of expected changes in registered voters was rejected by the French Constitutional Council in decision 2008-573DC.

[8] Until 2008, French living abroad were allowed to vote for the Presidential elections and were specifically represented in the Senate, but had no representation in the lower chamber.

[9] The commission that dealt with the 2009 plan was constituted in April 2009, and published its report on June 27, 2009. The commission was chaired by Yves Guéna (a former leader of the right, who had helped write the 1958 Constitution), nominated by the President of the Republic. It members included three magistrates of the highest courts in France (Conseild'Etat, Cour des Comptes, Cour de Cassation), and two professors of public law: Dominique Chagnollaud, nominated by the Chairman of the National Assembly, and Bernard Castagnède, nominated by the Chairman of the Senate. Chagnollaud had been advisor in Barre's center right government in the late 1970s, while Castagnède was Deputy Leader of the center right Parti Radical.

[10] The Commission did not publish any opinion dealing with the final version of the redistricting plan.

general form of the apportionment method that assigns seats to departments (the Adams method), as well as a degree of continuity in staffing for the drawing up of the plan.[11] However, there were changes from 1986 to 2009 in terms of the requirement for minimal representation of each apportionment unit. The rule of a minimum of two seats for each metropolitan department implemented in 1986 was rejected as unconstitutional by decision 2008-573DC of the Constitutional Council, and minimal representation was decreased to one seat per unit. That decision asserted that representation should be based mainly on population. Here we should note that the Adams method of apportionment, because of the way it handles rounding, automatically implements the principle of giving each department at least one seat.[12]

When we move from apportionment of seats to departments to district lines within departments, a guiding principle was that the population of districts within any department were not to be under or over 20 percent[13] of the mean district population of the department – except for special circumstances. Two other principles approved by the Constitutional Council are also very important. The first principle requires the territorial continuity of districts, i.e., what is called in the U.S. literature on districting, district *contiguity* (Grofman, 1985). The second principle is that cantons[14] with fewer than 40,000 residents should be kept intact within a single constituency even if splitting the canton would have allowed for greater population equality across the districts within a department (86-208DC). The third principle is that municipalities with less than 5000 inhabitants should be kept intact. However, a further principle, one requiring some level of district *compactness* (Grofman, 1985), does not appear in French jurisprudence.

2.2. Malapportionment and partisan bias in a multiparty system

To evaluate partisan consequences of redistricting in France, and the link between malapportionment and partisan bias, two important complications must be addressed.

First, most models of partisan bias deal only with two party competition, but France has multiparty politics. For example, in 2102, 6611[15] candidates ran in the 577 French constituencies (an average of 11.5 candidates by district in the first round), 2374 of whom received more than 5 percent of the vote. Thus, on average, there were roughly 4 candidates with more than 5 percent of the vote in each district. However, French politics in the Fifth Republic has historically been defined in terms of a left bloc and a right bloc, with two major parties in each bloc for much of this time although the National Front, as it grows in terms of support, looks more and more as a block in itself.[16] Our analysis of the link between

malapportionment and partisan bias in France will be in terms of a two bloc model, with a left bloc and a right bloc. By doing our analysis in terms of two blocs, looking at the combined share of votes and seats for parties in one or the other of the two blocs, we can draw on existing methodology for two party elections (see esp. Grofman et al., 1997; cf. Brookes, 1960; Johnston et al., 1999; Rossiter et al., 2012) to parcel out the degree to which malapportionment matters for partisan bias, as compared to factors such as the geographical distributions of party bloc strength.

We define the left bloc as organized around the Socialist party, joined by the Communist party (for the whole period) and by the Greens (from 1997 onwards). The right bloc was organized by the alliance between the UDF and the RPR until 2002; it has been structured by the UMP since 2002, in alliance with various moderate right groupings (New Center, UDI, Radicals, etc.). As for the centrist MoDem of François Bayrou, we consider it as outside the right bloc from 2007 up to and including the election of 2012 (see Sauger, 2007). The National Front, and the extreme left parties (e.g., those of Trotskyist leaning) are treated as not being part of any bloc, and variety of very minor parties are also excluded. Candidates and representatives without explicit party affiliation but who have an explicit leaning towards one of the bloc (those in France often called '*divers*' left or right) have been aggregated to their bloc.

The parties we have excluded from the two blocs as we have defined them have never represented more than 2 per cent of the seats in the National Assembly. But the picture is different if we look at votes rather than seats. Adding in minor parties that are not bloc affiliated and independent candidates, non-bloc voters represent a sizeable share of the electorate: from a low of 10.7 per cent of the voters in 1988 to a high of 26.2 per cent in 1993. Nonetheless, because of the failure of these smaller parties to gain representation, and because most seats are determined in a contest between the largest parties of each bloc within the constituency, it is almost entirely the relative sizes of the two blocs in each constituency that have determined outcomes, and it is on that comparison that we will focus.

A second complication is that the two round ballot system used for the French legislature makes it difficult to directly assess proportionality of vote shares and seat shares.[17] For two round ballots we need to decide how to combine the first round and the second round vote shares and seat outcomes. Different authors have dealt differently with this question. For example, Dolez and Laurent (2005) focus almost entirely on the second round, and especially on the second round contests involving opposing left and right candidates. Yet, as shown by Table 1, the proportion of this type of competition varies greatly over time; the number of victories in the first round is only 7 in 1997 but reaches 110 in 2007. We will, instead deal with the data analysis of a two round election by combining data from both rounds, always using whichever round is

---

[11] While Charles Pasqua, the Minister of the Interior during the previous redistricting, was no longer in office, Alain Marleix, Secretary of State of Interior and Local Governments, who had been Pasqua's special advisor of in the 1980s, and who had been closely involved with the redistricting plan of 1986, was put in charge of the 2009 redistricting; while Hervé Fabre-Aubrespy, also part of Pasqua's team in 1985, was in 2009 special advisor to the Prime Minister on election regulation.

[12] We do not consider in this paper the issue of overseas territories.

[13] The 2009 language was virtually identical to that used in 1986. But we should note that, as the legislation was originally drafted in 2009, within department population variation was to be within a limit of plus or minus 15 percent of the mean district population. The rapporteur of the law in the National Assembly introduced a successful amendment to raise the tolerance from 15 percent to 20 percent. This amendment accomplished the purposes of avoiding the legal need to redraw his former district on population discrepancy grounds.

[14] Cantons are the subdivisions of departments that are the basic building blocs of districts. Cantons can cut across borders of municipalities.

[15] All electoral information in this paper is based on data from the French Ministry of Interior.

[16] See Parodi (1989) and Schlesinger and Schlesinger (1998). A discussion of the developments of the French party system can be found in Sauger (2009).

[17] The structure of the blocs has implications for how outcomes of the first round affect the second round, and also for which parties run in particular constituencies. Parties do not field candidates in every district. Patterns of pre-electoral agreements are quite complex in France (see e.g., Tsebelis, 1990; Golder, 2006). They involve 'gentlemen's agreements' (no competition within the same block in the second round, requiring formal or informal agreements about which candidate from within the bloc will contest the second round: Blais and Indridason, 2007)), and agreements to avoid contestation within the bloc at the first round, with bargaining as to which party is 'assigned' which seat. Both types of arrangements make it hard to assess the 'true' proportionality of seats-votes relationships, or the degree of partisan bias, except possibly at the bloc level, since these non-contestation and second round stand-down arrangements are linked to which of the two major ideologically defined blocs in French politics a party identifies with. (We might also note that members of the same party may run against each other in the same district, one of them usually officially endorsed by the party, the other one not –though the local party may implicitly support the latter.)

Table 1
Typology of districts grouped by type of electoral competition.

Winner in	Number of candidates in second round	Bloc which wins	1988	1993	1997	2002	2007	2012
First Round		Left	39	0	0	1	1	22
		Right	76	72	7	53	109	10
		Other	0	0	0	0	0	0
Second Round	1	Left	19	3	12	5	0	52
		Right	0	17	0	3	0	1
		Other	0	0	0	0	1	0
	2 (L and R)	Left	222	71	225	154	212	216
		Right	175	260	173	295	219	164
	2 (LL)	Left	0	2	1	1	0	4
	2 (RR)	Right	2	27	2	5	7	3
	2 (L Other)	Left	8	5	24	8	1	27
		Other	1	0	1	0	1	2
	2 (R other)	Right	0	83	31	20	2	10
		Other	0	0	0	0	1	0
	3	Left	6	5	48	3	0	13
		Right	7	10	31	7	0	13
		Other	0	0	0	0	1	2
N			555	555	555	555	555	539

Note: Overseas territories are excluded.
Source: Ministry of Interior publications.

the decisive election.[18] In particular, in a methodology original to this paper, we distinguish various possible cases, of which two (Cases I and IV) cover a high proportion of outcomes.

- Case I. The winner is decided at the first round, and is a candidate of either the left or the right.
- Case II. The winner is decided at the first round, but is NOT a candidate of either the left or the right. There is no such case in our data set, once overseas territories are excluded.
- Case III. The winner is decided at the second round in a one candidate contest. (because any other candidate who us entitled to compete on the second round does not run)[19] We include this case and assign the vote tally to the winning bloc based on the first round votes.
- Case IV. The winner is decided at the second round in a two candidate contest, and is a candidate of either the left or the right. (If both candidates are of the left or both of the right, we reconstruct the score of the losing bloc as the sum of the votes gained by candidates of this bloc in the first round.)
- Case V. The winner is decided at the second round in a more than two candidate contest, and is a candidate of either the left or the right.
- Case VI. The winner is decided at the second round but is NOT a candidate of either the left or the right. Once again, the scarcity of this type of cases has led us to drop these cases from our analyses.

Election data is shown in Table 1 for the six elections of interest.

3. Malapportionment in the six legislative elections in France from 1988 to 2012

There are multiple ways to assess disproportionality between population and seats, and these may not yield the same evaluations of how close a given apportionment is to being perfectly proportional. In particular, for almost all of the standard apportionment methods for dealing with the problem of making integer assignments of seats to geographic units there will be one or more indices of proportionality under which that rule would be judged the most proportional. Here we will use the *Loosemore-Hanby Index of Distortion* (Loosemore and Hanby, 1971) because it is the most frequently used method in political science, and arguably the most straightforward.

Note that, unlike its most common use, assessing the seats-votes relationship, we use this index for assessing malapportionment. Under the L-H method we simply sum up over all units the absolute value of the difference in each unit between its share of the total number of seats and its share of total population.

Because redistricting in France is a two-step process, with the first step being the allocation of seats to departments via a form of proportional representation and the second the creation of districts within each department, we must address the malapportionment issue (as well as the issue of partisan bias) separately at each level.

We first provide some basic comparative data about malapportionment across the six legislative elections over the period 1988–2012:1988, 1993, 1997, 2002, 2007, and 2012 at the department level. Because legal populations in France have been determined annually only since 2006, we have to interpolate population data at the level of departments for a number of missing years.[20] We present data in Table 2.

The absence of a new census-based redistricting between 1988 and 2012 allowed population inequalities to grow and persist. The growth in malapportionment, while slow, is steady. Table 2 shows us a return to an even lower level of malapportionment in the 2012 election after the new apportionment than was the case in 1988.

---

[18] This concept of decisive round has been largely promoted by one of the most well-known French specialist of election, François Goguel. See for instance Goguel (1983).

[19] This is often the case if the top two contenders in the first round are from the left, for which explicit party agreements require the candidate coming second to step down, thus leading to an unopposed second round.

[20] These interpolations are based on six observations over time: legal populations as measured by the French official statistical institute for the years 1982, 1990, 1999, 2006, 2009, and 2011. Population data for department is available through the National Statistics Office (INSEE). For districts, except for 1990 and 1999, data has to be reaggregated from canton and municipal population data (as we know the cantonal composition of districts and we have cantonal populations). However, although districts are officially defined by groupings of cantons, examining change in district composition can be difficult because changes in the municipal composition of cantons needs to be taken into account, and because districts may change in numbering from one plan to another. We can, nonetheless, estimate population values by using population at the canton level, and at the municipal levels if cantons were split or changed between districts, to recreate constituency level population data across censuses.

Table 2
Summarizing population share and seat allocation share differences at the department level for apportionment in France, 1988–2012 (Loosemore-Hanby index of distortion).

Election year	1988	1993	1997	2002	2007	2012
LH sum	0.036	0.039	0.045	0.051	0.056	0.034

Source: Ministry of Interior and INSEE publications. Overseas territories are excluded.

Table 3
Summarizing population share and seat allocation share differences at the district level by department in France, 1988–2012 (Loosemore-Hanby index of distortion).

Election year	1988	1993	1997	2002	2007	2012
LH index	0.050	0.056	0.062	0.068	0.071	0.045
N (districts)	555	555	555	555	555	537

Note: Departments with only one seat have been excluded.
Source: Ministry of Interior and INSEE publications. (overseas territories excluded).

The data in Table 2 is at the department level. Do our findings about growing inter-censal malapportionment change by conducting analyses at the district level? The ideal district size is 117,575 in 2012. Looking at population data three years after the redistricting plan, the smallest district in the metropolitan area is 69,995 while the largest is 131,137. While this may seem like a large discrepancy, it represents considerable improvement compared to the inter-censal period, or even 1988 (two years after the 1986 redistricting). The Loosemore-Hanby index of distortion indeed shows increasing disproportionality over time until 2012, but a better situation in 2012 compared to 1988 (see Table 3).

The numbers reported above are across all departments, but a usual way to approach one person, one vote, is territory specific, so that looking at malapportionment within each department seems a natural way to proceed (Table 4).

As expected, malapportionment is less severe when computed within each department, but follows the same time trends depicted previously. However, there remains a rather high standard deviation in district sizes even within department. At the constituency level, when all districts are combined, the 2012 election has a malapportionment that is marginally lower than what was found in 1988; at the department level this is not true, but the 2012 figures are very close to those in 1988. The most important fact is that the pattern of increasing malapportionment is sharply reversed in 2012 at both levels of analysis. The difference between time trends at the departmental level and the within department level is at least partly due to the fact departments were no longer guaranteed a representation of at least two as of 2009. This change helps explains the further improvement in 2012 at the national level, but has no effect at the departmental level.

4. Three sources of partisan bias

It has long been assumed in France that redistricting had political goals (see e.g., Bon, 1978: 114–115; Balinksi, 2008). However while partisan bias can occur deliberately, it can also occur accidentally. It can result from line drawing using tools of gerrymandering to disperse the voting strength of disfavored groups over multiple districts and/or concentrate their voting strength in a few districts to limit their seat winning abilities (*cracking* and *packing* forms of gerrymander, respectively: Grofman, 1975). Another form of bias can be generated when districts differ in their populations (or in their per capita representation) and these differences have implications for the conversion of votes into seats.[21] But it can also occur when there is a 'natural' difference in the degree to which supporters of each party or party bloc are geographically concentrated, e.g., if the left is highly disproportionately concentrated in urban areas. Also, bias in translating votes into seats can occur when supporters of different parties differ in their turnout (or registration) levels, since one party may benefit from winning more 'cheap seats,' i.e., seats where the total number of votes cast is low. In other words, if one party wins its seats with

an, on average, larger vote shares than another party, a bias against that party may arise because of a higher number of wasted votes in the gain of these seats.

As noted earlier, partisan bias is more likely when districting is a partisan process, especially if it is not guided by strict legal principles; and when redistricting is rare, allowing population inequalities to grow and when there is substantial variation in the spatial distribution of partisan support so that gerrymandering tools, such as packing and cracking can have their greatest effect. Even if we deal with the problem of measuring partisan bias in a multiparty system by focusing on two opposing blocs, there are many causes of partisan bias, and separating out the effects of malapportionment from other causes, e.g., geographic differences in the distribution of electoral strength across parties and blocs, or differences in turnout across blocs, can be difficult.

We wish to evaluate the claim that redistricting in France generally benefits the right. And we wish to disentangle possible causes of the partisan bias we do observe. Following Grofman et al. (1997), we try to disentangle the relative weight of the three main expected sources of bias: (1) bias due to the distribution of voters' partisan preferences at the district level that lead to asymmetries in the translation of votes into seats; (2) bias due to malapportionment, and thus tied to choices made in the redistricting process or due to a failure to conduct apportionment in a timely fashion that allowed population inequalities to grow; (3) bias due to turnout (or voting eligibility) differences across blocs.

We can follow the Grofman et al. (1997) notations and principles, since we are conducting our analysis vis-a-vis a two-bloc analysis. In terms of seats and votes, disproportionality is the difference between vote share and seat share. Seat share seems completely non-problematic and it might also seem that there is only one way to estimate vote shares of a given party or set of parties in a system that elects from single seat constituencies, namely to add up the votes for those parties across the different constituencies and divide it by the total numbers of votes cast. But that is not really the case. This is only one of the two 'obvious' ways to estimate a party or bloc's share of the votes. The other way is to take a party (or bloc's) vote share in each constituency and then take the mean across constituencies. The two measures need not correspond. The first of these measures R_i, and the second P_i. The difference between the two measures of vote share can be attributed to difference in the total number of votes cast in each district. In turn, that difference can be attributed to two factors: population differences across districts, and turnout differences across districts.[22] A third important measure is M_i. M_i is estimate of vote share that has been adjusted to eliminate apportionment effects. Key to the Grofman et al. (1997) decomposition of bias effects into three disjoint causes is an understanding of the relationship between R_i, P_i and M_i as different weighted functions of the

---

[21] For a more general discussion of forms of bias see Grofman et al., (1997).

[22] In turn, turnout differences can be attributed to multiple factors, such as differences in the support bases of the parties in voting age eligibility, citizenship eligibility, or registration (Brace et al., 1988). We will not pursue this further level of analysis here.

Table 4
Summarizing population share and seat allocation share differences at the district level by department in France, 1988–2012 (Loosemore-Hanby index of distortion).

Election year	1988	1993	1997	2002	2007	2012
LH mean, By department	0.030	0.033	0.037	0.039	0.041	0.031
LH st. dev.	0.013	0.015	0.017	0.019	0.021	0.015
LH min	0.006 (Corse du Sud)	0.005 (Corse-du-Sud)	0.004 (Tarn-et-Garonne)	0.001 (Tarn-et-Garonne)	0.003 (Corse-du-Sud)	0.001 (Haute-Saône)
LH max	0.071 (Var)	0.086 (Var)	0.099 (Var)	0.110 (Var)	0.114 (Var)	0.109 (Jura)
N	96 departments, 555 districts	96 departments, 555 districts	96 departments, 555 districts	96 departments, 555 districts	96 departments, 555 districts	94 departments, 537 districts

Note: Departments or territories with only one seat have been excluded.
Note: For 2012, LH index equals 0.031 for France, overseas territories included, districts for French living abroad excluded; if districts for which more difficult interpolation of population data are excluded, LH equals 0.037.
Source: Ministry of Interior and INSEE publications. (overseas territories excluded).

proportion of votes won by each party in each district.

4.1. Notation

More precisely, let S be the size of the legislature, N be the number of separate constituencies, and Q be the total population, with, in our case, S=N as we consider a legislature using single seat constituencies.[23]

Let s_{ij} be the number of seats won by party i in the jth district and S_i be the number of seats won by party i nationally, i.e.,

$$S_i = \sum_j s_{ij}$$

Let v_{ij} be the number of votes won by party i in the jth district and V_i be the number of votes won (across all constituencies) by all candidates of party i, i.e.,

$$V_i = \sum_j v_{ij}$$

Let V be the total number of votes cast for legislative office, i.e.,

$$V = \sum_i V_i$$

Let p_{ij} be the proportion of votes won by party i in the jth district, i.e.,

$$p_{ij} = \frac{v_{ij}}{V_i}$$

Let t_j be the ratio of (two-party) turnout in the jth district to total turnout, i.e.,

$$t_j = \frac{\sum_i v_{ij}}{V}$$

Let q_j be the proportion of the country's total population in the jth district.

If we have a two-party or two-bloc system, then i takes on values from the set {1, 2}.

Let P_i be the average proportion of the (two-party or two bloc) vote (across districts) received by party i, i.e.,

$$P_i = \frac{\sum_j p_{ij}}{S}$$

Let R_i be party i's share of the total national (two party or two bloc) raw vote, i.e., party i's share of the total votes cast in the election for either party (or bloc) won by that party's candidates across all the districts, i.e.,

$$R_i = \frac{V_i}{V}$$

Let M_i be the mean population weighted share of the vote for party i across all constituencies, i.e.,

$$M_i = \sum_j q_j p_{ij}$$

Key to the Grofman et al. (1997) decomposition of bias effects into three disjoint causes is an understanding of the relationship between R_i, P_i and M_i as different weighted functions of the p_{ij} values. It is straightforward to represent P_i as such a weighted function. All we need do is take the weights to be:

$w_j = \frac{1}{S}$, for all j.

It is apparent, for single seat constituencies, that:

$$\sum_j w_j = 1$$

This gives us the definition of $P_i = \frac{\sum_j p_{ij}}{S}$ given earlier. Similarly, $\sum_j t_j = 1$, and so we again have $R_i = \frac{V_i}{V} = \sum_j p_{ij} t_j$. Similarly, $\sum q_j = 1$, and so M_i, too, is a weighted average of the p_{ij} values.

4.2. Distributional bias

We begin our analysis with distributional bias, where we measure vote share by P_i rather than by R_i. Distributional bias in the two party context has generally been measured as the deviation from partisan symmetry, meaning that two blocs with equal vote shares would not be expected to get identical political representation in terms of seats (Tufte, 1973; Gelman and King, 1994; Grofman and King, 2007). Using P_i as our measure of vote shares, means that we are weighting all constituencies equally. In other words, when we measure distributional bias we are measuring 'pure' distributional bias.

To measure the distributional aspect of partisan bias, two main empirical strategies have been followed. The first draws inference about the effect of a change in electoral results on seat distribution by estimating a pattern across a series of elections (see for instance Kendall and Stuart, 1950; Tufte, 1973), where there is a single point on the seats-vote curve for each election, i.e., each election is a single case. This method rests on very strong and implausible assumptions about the stability of swing ratios and bias over time (see discussion in Niemi and Fett, 1986; Jackman, 1994).[24] An

---

[23] See Grofman et al., (1997) for the general case.

[24] Also, those who use this method often use R_i rather than P_i as their measure of party/party bloc voting strength.

Table 5
Three forms of bias in French legislative elections at the constituency level, 1988–2012.

	1988		1993		1997		2002		2007		2012	
Pi	51.03		39.83		52.05		45,17		45.42		52.50	
Ri	50.95		41.00		51.88		45.37		46.24		52.32	
Mi	51.22		40.00		52.12		45.14		46.71		52.64	
Malapportionment related bias (Mi-Pi)	0.19	ns	0.17	ns	0.07	ns	−0.03	ns	1.29	**	0.14	ns
Turnout related bias (Ri-Mi)	−0.27	ns	1.00	*	−0.24	ns	0.23	ns	−0.47	ns	−0.32	ns
Pure distributional bias	−0.29	ns	0.72	ns	−0.63	ns	0.53	ns	1.18	**	0.55	ns
Total bias	−0.37		1.89		−0.80		0.73		2.00		0.37	

Positive values of bias are pro left.
**significant at 0.01 level; * significant at 0.05 level.
Significance computed by *t*-test (two tailed) and JudgeIt for distributional bias.

alternative approach proposes to build counterfactuals so as to estimate the impact of a change in electoral support on seat distribution in some particular election, using electoral outcome data at the constituency level. There are two main variants of the counterfactual approach. One is based on the assumption of a uniform *swing* across all districts (Brookes, 1960; Dahl, 1956; Campagna and Grofman, 1990; Niemi and Deegan, 1978). The other approach (Gelman and King (1994), King and Gelman (1991)) propose to generate the needed counterfactuals in a probabilistic fashion, not just from the actual distribution of votes across districts in the given election, but also taking into account variability of electoral results within districts, with parameters of variability estimated from data from a larger set of recent elections. King has made available for public use a computer program, Judgeit2 of which he is the co-author, to implement his algorithm to make such calculations, and we make use of it in the analyses below.[25]

Because we use estimates of bias due to distributional causes as our baseline estimates – which we subsequently adjust to add in turnout and malapportionment effects – and our estimates of distributional bias are based on election returns by district, in this table we report effects only constituency level data. See Table 5. For this analysis, however, we are able to estimate the statistical significance of the partisan differences we find.

The results show clearly the absence of significant distributional bias in five of the six elections considered. The only exception is the election of 2007, for which we detect a substantively small but statistically significant bias, in favor of the left.

4.3. Biases linked to malapportionment and/or turnout/voting eligibility differences

To estimate bias due to malapportionment, we measure this bias as the difference between M_i and P_i, i.e., between the bloc vote share at the district level weighted by the population share of the district, and the vote share that gives results treating every district as if there were no effects of either population differences or turnout differences across districts. To estimate bias due to turnout, we look at the difference between M_i and R_i, i.e. between the bloc vote share at the district level weighted by the population share of the district, and the vote share based on actual total turnout. The results are again shown in Table 5.

Looking at Table 5, the main result again appears to be the absence of significant biases. Malapportionment related bias is significant only for the 2007 elections while turnout related bias is significant only in 1993. In both cases, these biases are in favor of the left.

[25] Judgeit2 (computer program available free via download from http://gking.harvard.edu/).

4.4. Overall partisan biases

Even when we add the three columns in Table 5, summing the different kinds of biasing effects so as to derive a measure of total bias, the magnitude of overall effects estimated is not that large. Although total bias appears to fluctuate over the years, we still find almost no substantively significant effects, except for 1993 and 2007. In particular, there was very little overall bias in the 2012 election.

4.5. Taking into account third parties

To provide some more robustness to our result, we have to come back to our initial choice about leaving out all parties outside the two main blocs in French politics. The National Front has especially attracted attention as the most important of these third parties in the period considered. And there are good reasons why this party cannot be aggregated to either of the two blocs. In particular, in all cases, when a candidate of the National Front was eligible to run in the runoff, she did run. Even at the district level agreements between the National Front and either the center right or the Socialists or Communists have never happened in the period under investigation. The two main blocs kept to a tight "*cordon sanitaire*" strategy with regards to this party. Fortunately, a National Front candidate is present in the runoff in a very small minority of cases, i.e. less than 15 per cent of all districts on average in the period considered.

When a National Front candidate did ran as a third candidate or when first round results were taken into account, excluding the National Front from the analysis has meant treating its supporters as engaged in abstention. To understand whether the National Front introduces some bias in the two-bloc competition in France, we can thus decompose the difference between M_i and R_i used previously by differentiating actual turnout from votes for third parties (among which is the National Front). We compute this decomposition in relevant districts in Table 6.

Taken into account the smaller number of districts involved, some interesting results appear. First, bias purely due to turnout is larger than bias resulting from votes to parties that fall outside the two blocs. National Front successes in entering the second round help the left, especially in 1997. On the other hand, the success of other minor parties (mainly from the far left) in entering the second round are detrimental to the left.

5. Conclusion

Because the redistricting process in France is done by political authorities rather than by civil service officials, and because the outcomes of redistrictings have been claimed to be biased in favor of the party then controlling the government, analyzing partisan bias (and the interaction between malapportionment and partisan

Table 6
Decomposing turnout related bias in selected districts.

	1988		1993		1997		2002		2007		2012	
Turnout related bias	−0.41	ns	0.97	**	−0.46	ns	−0.14	ns	−0.49	*	−0.37	ns
National Front related bias	0.23	ns	0.08	ns	0.52	*	0.16	ns	0.02	ns	0.19	ns
Other third parties related bias	−0.17	ns	0.07	ns	−0.42	ns	0.26	ns	−0.10	ns	−0.07	ns
Ri-Mi (Selected districts)	−0.35	ns	1.12	**	−0.36	ns	0.28	ns	−0.57	*	−0.25	ns
Ri-Mi (All districts)	−0.27	ns	1.00	*	−0.24	ns	0.23	ns	−0.47	ns	−0.32	ns
N (districts)	156		195		154		100		117		152	

Positive values of bias are pro left.
**significant at 0.01 level; * significant at 0.05 level.
Significance computed by *t*-test (two tailed).

bias) in France seems of particular interest for those concerned with the political consequences of electoral laws. In the light of claims about the pro-rightist bias in French redistricting it is interesting that the only statistically significant partisan bias we ever find is slightly in favor of the left, despite the fact that it was Gaullists who were in control of the relevant redistrictings. But an equally important finding is that, when we combine evidence from both the first and second round, there are only minuscule partisan bias effects for most French elections.

Yet, France is associated with significant malapportionment. In the comparative analysis of malapportionment found in Samuels and Snyder (2001) based on data from an election many years after the last apportionment, France is shown as one of the handful of most malapportioned countries in Western Europe (see Table 3, pp. 660—661). Our analysis, in which we are able to examine in a longitudinal perspective the changes in partisan bias (at the bloc level) in France over a set of six different elections, spanning four different decades, and in which we combine data from both first round and second round elections rather than looking only at the second round, confirms that malapportionment in France was very substantial at the time of the Samuels and Snyder analysis, and subsequently. But we also show that, after the population adjustments following the 2009 redistricting, malapportionment returned to a low level virtually identical to its low point in the past.

Why has the politicization of the process produce infrequent redistricting, little partisan bias, and significant malapportionment in France? If we look back at the left government of 1997—2002, some answers can be provided. This government decided not to redistrict. This is not because the government believed in the existence of a bias in its favor (Ehrhard, 2013). It is mainly for two reasons. The first one is for the fear of an electoral cost. Being blamed for partisan redistricting could have cost much than an electoral advantage provided by an electoral map. The 2009 redistricting indeed lead to some heated debates in the news, with controversies in all major newspapers.[26] However, these debates did not last long, and, in an open-question in survey ran in 2012 about Sarkozy's decisions, no one actually mention redistricting as an important element in their vote choice, whether good or bad. The second reason is for the fear of the political cost. Redistricting means making some of your MPs and MPs of your coalition partners risk losing their seat. And this risk appeared to be unaffordable for this government, in a period of divided government, with not so disciplined allies, and a quite factionalized party. For the same reasons, the 2009 plan we study here has been conservative, not in an ideological sense, but because it kept untouched as many districts as possible. Only a bit more of half of the districts (53.6 per cent) have been created, abolished, or modified by the 2009 plan. This reluctance to redistrict is one of the important reasons for the long history of substantial malapportionment in France.

Appendix

Chronology of the 2009 Redistricting Plan

- 17/09/2008: bill including the authorization to the government to legislate through ordinance introduced in Council of Ministers. The bill is worded so that the Government has to 'update' the districting map. It is also expected that the new map respect the principle of territorial continuity of districts (except for special circumstances), do not split across different districts municipalities with less than 5000 inhabitants and cantons with less than 40,000 inhabitants. The population of districts with a department should not be under or over 20% of the mean district population of the department, except for special circumstances. This bill also provides for the installation of the new Consultative committee introduced by the Constitutional law of 2008.
- Bill voted by the National Assembly on 20/11/2008 (with urgency procedure) and voted without amendments by the Senate on 11/12/2008.
- 01/01/2009: official publication of legal populations for 2006, based on INSEE 2006 general census.
- 08/01/2009: decision 2008-573DC of the Constitutional Council; bill partially censored. The lowest number of representative by department fixed at 2 is unconstitutional; overseas territories with few inhabitants are not expected to get one specific representative, except for a specific remoteness. Taking in consideration the evolution of the number of registered voters besides the evolution of legal population in unconstitutional.
- 13/01/2009: promulgation of the bill (2009-39).[27]
- 22/04/2009: new Consultative Commission installed.
- 30/04/2009: project of ordinance submitted to the Consultative committee.
- 23/06/2009: assessment of the Consultative committee. No reservation on the apportionment of seats to departments. Reservations about half of the departmental districting maps.
- 31/07/2009: Ordinance 2009-935 officially published.

---

[26] For instance, see *Le Figaro* (10/13/2009), *Le Monde* (04/13/2009), *Libération* (01/26/2009).

[27] http://www.assemblee-nationale.fr/13/dossiers/commission_article25_an.asp.

■ 13/10/2009-21/01/2010: Debates and votes on the bill of ratification of the ordinance at the National Assembly and Senate (rejected in first reading by the Senate on 14/12/2009). Final adoption on 21/01/2010.[28]

■ 18/02/2010: Constitutional Council confirms the conformity to the Constitution.

References

Balinksi, Michel, 2008. Redistricting in France under changing electoral rules. In: Handley, Lisa, Grofman, Bernard (Eds.), Redistricting in Comparative Perspective. Oxford University Press, Oxford, pp. 173—190.

Balinski, Michel, Young, H. Peyton, 1982. Fair Representation: Meeting the Ideal of One Man, One Vote. Yale University Press, New Haven.

Blais, André, Indridason, Indridi H., 2007. Making candidates count: the logic of electoral alliances in two-round legislative elections. J. Polit. 69 (1), 193—205.

Bon, Frédéric, 1978. Les élections en France. Le Seuil, Paris.

Brace, Kimball, Grofman, Bernard, Handley, Lisa, Niemi, Richard, 1988. Minority voting equality: the 65 percent rule in theory and practice. Law Policy 10 (1), 43—62.

Brookes, R.H., 1960. The analysis of distorted representation in two-party, single-member elections. Polit. Sci. 12, 158—167.

Campagna, Janet, Grofman, Bernard, 1990. Party control and partisan bias in 1980s congressional redistricting. J. Polit. 52 (4), 1242—1257.

Dahl, Robert A., 1956. A Preface to Democratic Theory. University of Chicago Press, Chicago, IL.

Dolez, Bernard, Laurent, Annie, 2005. The seat-vote equation in French legislative elections (1978-2002). Fr. Polit. 3, 124—141.

Dubois, Eric, 2014. The influence of the legislative redistricting of 2009: methodological issues and first insights. Fr. Polit. 12, 331—337.

Ehrhard, T., 2013. Le découpage électoral des circonscriptions législatives : le Parlement hors jeu? Pouvoirs 146, 117—132.

Gaudillère, Bernard, 1995. Atlas historique des circonscriptions électorales françaises. Genève, Droz.

Gelman, Andrew, King, Gary, 1994. A unified method of evaluating electoral systems and redistricting plans. Am. J. Polit. Sci. 38 (2), 514—554.

Goguel, François, 1983. Chroniques électorales: La Cinquième République du général de Gaulle. Presses de Sciences Po, Paris.

Golder, Sona N., 2006. Pre-electoral coalition formation in ParliamentaryDemocracies. Br. J. Polit. Sci. 36, 193—212.

Grilli di Cortona, P., Manzi, C., Pennisi, A., Ricca, F., Simeone, B., 1999. Evaluation and Optimization of Electoral Systems. SIAM, Philadelphia PA.

Grofman, Bernard, 1975. A review of macro-election systems. In: Wildenmann, Rudolph (Ed.), German Political Yearbook (Sozialwissenschaftliches Jahrbuch fur Politik), vol. 4. Munich Germany: Gunter Olzog Verlag, pp. 303—352.

Grofman, Bernard, 1983. Measures of bias and proportionality in seats-votes relationships. Polit. Methodol. 9, 295—327.

Grofman, Bernard, 1985. Criteria for districting: a social science perspective. UCLA Law Rev. 33 (1), 177—184.

Grofman, Bernard, King, Gary, 2007. Partisan symmetry and the test for gerrymandering claims after *LULAC v. Perry*. Elect. Law J. 6 (1), 2—35.

Grofman, Bernard, Koetzle, William, Brunell, Thomas, 1997. An integrated perspective on the three potential sources of partisan bias: malapportionment, turnout differences, and the geographic distribution of party vote shares. Elect. Stud. 16 (4), 457—470.

Handley, Lisa, Grofman, Bernard (Eds.), 2008. Redistricting in Comparative Perspective. Oxford University Press, Oxford.

Jackman, Simon, 1994. Measuring electoral bias - Australia, 1949-93. Br. J. Polit. Sci. 24, 319—357.

Johnston, Ron, Rossiter, David, Pattie, Charles, 1999. Integrating and decomposing the sources of partisan bias: brookes' method and the impact of redistricting in Great Britain. Elect. Stud. 18, 367—378.

Judgeit2: http://gking.harvard.edu/.

Kendall, M.G., Stuart, A., 1950. The law of the cubic proportion in election results. Br. J. Sociol. 1 (3), 183—196.

King, G., Gelman, A., 1991. Systemic consequences of incumbency advantage in US House elections. Am. J. Polit. Sci. 35 (1), 110—138.

Loosemore, John, Hanby, Victor J., 1971. The theoretical limits of maximum distortion: some analytic expressions for electoral systems. Br. J. Polit. Sci. 1, 467—477.

Niemi, Richard G., Deegan Jr., John, 1978. A theory of political districting. Am. Polit. Sci. Rev. 72 (4), 1304—1323.

Niemi, R.G., Fett, P., 1986. The swing ratio: an explanation and an assessment. Legis. Stud. Q. 11 (1), 75—90.

Parodi, Jean-Luc, 1989. Le nouvel espace politique français. In: Mény, Yves (Ed.), Idéologies, partis politiques, et groups sociaux. Presses de la FNSP, Paris, pp. 147—157.

Pennisi, Aline, 1998. Disproportionality indexes and robustness of proportional allocation methods. Elect. Stud. 17 (1), 3—19.

Ponceyri, Robert, 1988. Le Découpage Électoral. Economica, Paris.

Rossiter, David, Johnston, Ron, Patty, Charles, 2012. Representing People and Representing Places: Community, Continuity and the Current Redistribution of Parliamentary Constituenciesin the UK. Parliamentary Affairs, Online First.

Samuels, David, Snyder, Richard, 2001. The value of a vote: malapportionment in comparative perspective. Br. J. Polit. Sci. 31, 651—671.

Sauger, Nicolas, 2007. Le vote Bayrou: l'échec d'un succès. Rev. Fr. de Sci. Polit. 57 (3—4), 447—458.

Sauger, Nicolas, 2009. The French party system: fifty years of change. In: Brouard, S., Appleton, A., Mazur, A. (Eds.), The Fifth Republic at Fifty. Palgrave, Basingstoke, pp. 79—98.

Schlesinger, J.A., Schlesinger, M.S., 1998. Dual ballot elections and political parties: the French presidential election of 1995. Comp. Polit. Stud. 31 (1), 72—97.

Tsebelis, George, 1990. Nested Games: Rational Choice in Comparative Politics. University of California Press, Berkeley.

Tufte, Edward, 1973. The relationship between seats and votes in two-party systems. Am. Polit. Sci. Rev. 67 (2), 540—554.

---

[28] http://www.senat.fr/dossier-legislatif/pjl09-048.html.