



VOTE GEOGRAPHY IN THE 2018 ELECTIONS FOR THE CHAMBER OF DEPUTIES

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Abstract: The article studies the vote geography of the federal deputies elected in 2018 in Brazil, through an exploratory data analysis, classifying them into four different spatial patterns of voting: concentrated-prevalent, concentrated-shared, fragmented-prevalent, and fragmented-shared, and analyzing the results at the state, regional, and party levels. In addition, it compares the data obtained with the 1998 elections, identifying the changes that occurred in the period. It was found that there is still a wide variation in the frequency distribution of voting patterns across the country, both from the state and regional point of view, and in addition, the general voting pattern has become increasingly fragmented and less concentrated, which indicates a decrease in the discretization of Brazilian elections.

Keywords: Vote geography; Elections; Federal deputies.

1 Introduction

This paper aims to study the geography of the vote of federal deputies who were successful in the 2018 election, from an exploratory analysis of the nominal votes obtained by them and how these votes are distributed across the various municipalities where they obtained votes.

Initially, we must emphasize the importance of the use of resources provided by quantitative analysis for the explanation of phenomena observed in the human sciences, notably in Political Science. In the research in large databases of electoral, socioeconomic, and legislative data, among others, it is possible to confront the data with different variables that can, at least in part, explain some behaviors of our political system, especially in the Legislative branch.

In this context, the geography of vote proposes to investigate the electoral origin of federal deputies and, based on this, better understand how their objectives and actions are prioritized in the parliamentary arena. Among several studies on the subject, this work has as reference the book by Nelson Rojas de Carvalho, “E no início eram as bases - geografia política do voto e comportamento legislativo no Brasil (And in the beginning there were the bases - political geography of voting and legislative behavior in Brazil)”, in which the author makes a broad study on the subject in the 1994 and 1998 elections, from the survey of how the electoral dispute took place in the municipalities and its correlation with socio-economic data, to the study of public policies, attitudes and behaviors developed by the congressmen, related to the pattern of distribution of the votes obtained in the electoral contest.

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Carvalho draws a parallel between the geographic voting pattern and parliamentary practices, basically concluding that MPs with more dominant voting are more parochialist, tending to raise funds for their bases, while MPs with shared voting work under a more universalist logic, opting for position-taking as a form of electoral connection.

The purpose of this article, therefore, is, in the first place, to verify how the different geographic profiles of elected officials are distributed today, and then to compare the results with those obtained by Carvalho (2003) two decades ago.

2 Geography of the Vote

The term “geography of the vote” does not find a single definition in theory, although it is widely used by several political scientists. We highlight the work of authors such as Fleischer (1976), Ames (2003), Carvalho (2003), and, more recently, Santos (2015) and Borges, Paula, and Silva (2016), who analyze the theme in different aspects.

According to Santos (2015), in a literature review on the topic, the initial studies on the geography of voting in Brazil “try to verify patterns in the distribution of votes in an election, in order to find out if there is any association between the vote that a given candidate, party or coalition received and certain territorial attributes”. As territorial attributes, the author cites as an example the “degree of urbanization, level of inequality and income distribution, and level of education of the population”, factors that could “help understand what are the social bases behind the election of candidates” (SANTOS, 2015, p. 2).

From a theoretical point of view, the study of the geography of the vote finds support in rational choice institutionalism. According to Hall and Taylor (2001), for adherents of this school, political life is “a series of collective action dilemmas”, composed of “situations in which individuals acting to maximize the satisfaction of their own preferences do so at the risk of producing a suboptimal outcome for the collectivity” (HALL; TAYLOR, 2001, p. 205).

In the context of the Legislative branch, these calculations and strategies are mainly focused on maximizing the chances of reelection. Consequently, their parliamentary behavior, be it in the voting of matters of interest to society, in the presentation of budget amendments, or even in the promotion of public policies, will be less focused on the interest of the collectivity than on the achievement of such objective. This is what Mayhew (1974) calls electoral connection.

Within the scope of rational choice theory, three main theoretical models propose to explain the functioning of the parliamentary arena, mainly in the United States: the informational, distributive, and party models. The informational model is related to a characteristic more present in the American Congress: the specialization of the commissions. In the party, the focus is on the presence of political parties and their strength in the entire political-parliamentary system. The distributive model, in turn, is related to pork-barrel

practices², in which the main objective of politicians is to achieve concentrated benefits for their constituencies³, with diffuse costs applied to the entire population.

Within the framework of rational choice theory, three main theoretical models propose to explain the functioning of the parliamentary arena, especially in the United States: the informational, distributive, and partisan models. The informational model is related to a feature most present in the U.S. Congress: the specialization of the committees. In the partisan model, the focus is on the presence of political parties and their strength throughout the political-parliamentary system. The distributive model, on the other hand, relates to pork-barrel practices (LEMOS, 2001, p. 567).

According to Carvalho (2003), some aspects of the Brazilian Legislative Branch analogous to those observed in the American Congress caused several authors to import this model to explain our reality. However, the author concludes that the generalization is imperfect, because unlike the American system, of simple majority and based on uninominal districts, “in the Brazilian case, the proportional system of open list allows and causes representatives to be elected from geographical units with extremely distinct configurations” (CARVALHO, 2003).

In his study published in 2003, the Brazilian Brazilianist Barry Ames proposes to scrutinize these different geographic configurations of the Brazilian reality, creating more complex contours by outlining the different combinations of electoral geography applicable to our electoral system. By analyzing the results of elections not only from the horizontal viewpoint of concentration or fragmentation of votes but also considering the vertical effect of the high or low dominance that deputies exert over their electoral bases, Ames (2003) thus establishes four types of informal districts that should guide parliamentary behavior in different ways: concentrated-dominant, dispersed-shared, dispersed-dominant and dispersed-shared (AMES, 2003, p. 65).

According to Ames (2003, p. 66), the concentrated-dominant municipality represents the “classic Brazilian electoral stronghold, in which one deputy dominates a group of contiguous municipalities”. It is that deputy that may belong to “a family of long-standing economic or political preeminence in a particular region”; or they may “have started their political career exercising local positions” or still “have made a deal with local caciques”.

Concentrated-shared municipalities, on the other hand, are the large metropolitan areas, those in which certain sectors of the electorate are so large that they can elect many deputies on their own. Examples are MPs who defend workers’ or ecological causes (AMES, 2003, p. 69).

The third type is the dispersed-shared municipalities, those that elect deputies from numerically insignificant sectors, but are quite loyal and distributed throughout the state, such as

² Termo usado para designar o uso de fundos do governo para projetos que visam agradar aos eleitores ou legisladores e conquistar votos.

³ Base eleitoral de um representante no âmbito do poder legislativo.

religious and descendants of immigrants (AMES, 2003, p. 70).

The last type drawn by Ames is the dispersed-dominant municipalities, corresponding to two types of candidates: those who make deals with local political leaders and also former occupants of positions in the state administration (such as secretary of state, a position with great possibility of exchanging favors and clientelistic practices) (AMES, 2003, p. 72).

Notwithstanding this complex system, the author concludes that the standard Brazilian politician is guided by distributive logic, since, according to him, “political institutions create incentives that encourage politicians to maximize their personal gains and to focus on digging out public works projects for localized constituencies or for their own political sponsors” (AMES, 2003, p. 18).

Carvalho (2003) uses the same methodological direction proposed by Ames (2003), which considers different geographical patterns of parliamentary elections but criticizes the generalization of his results. According to Carvalho, the American author “ends up generalizing a single behavior regarding the action of Brazilian parliamentarians: the search for disaggregated and pork-barrel resources for electoral bases, the prevalence of the logic of particularism” (CARVALHO, 2003, p. 59).

After analyzing the various patterns of vote distribution existing in the Brazilian system, and comparing the data with the attitudes and behaviors of the deputies during the legislatures to which they were elected, Carvalho (2003) outlines the characteristics attributed to each voting pattern, even suggesting new elements that contrast with what has been established in previous studies.

One of the author’s main findings is the dissociation between distributional behavior and a geographically focused vote, a characteristic present in our proportional system that was one of the main targets of criticism and one of the central elements of analysis of the early studies of geography of the vote, such as Fleischer (1974), Martins (1983), Indjaian (1981) and Dias (1991).

According to Carvalho (2003), in the Brazilian reality, even in cases where there is electoral fragmentation, this, “when combined with the vertical domination of municipalities, before translating a political dynamic of ideological order, appears as an indicator of political practices of pragmatic or even backward nature” (CARVALHO, 2003, p. 107).

This perception is corroborated by the fact that in the author’s studies, the fragmented-dominant pattern is by far the most characteristic of the Northeast, a region that, according to Monteiro and Júnior (2019), can hardly be understood “without looking at the constituted power relations; without understanding the force exerted by local and regional oligarchies in the dynamics of permanence or even transformation of institutions in the Brazilian Northeast” (MONTEIRO; JÚNIOR, 2019, p. 9).

On the other hand, Carvalho (2003) understands that parliamentarians with a

concentrated-shared voting pattern have “electoral bases in the capitals and large cities, for whom unbundled benefits bring little, or no electoral dividend since they are not liable to claim credit, given the large size of these electoral colleges”. For the author, instead of aiming at particularism, these parliamentarians would prioritize “maximizing their chances of re-election by taking a position in front of issues sensitive to their respective bases, whether through the presentation of propositions in Congress, votes in plenary, presence in the media. The same logic is applied to parliamentarians with fragmented-shared voting, who “would extract little electoral return from the allocation of unbundled benefits” (CARVALHO, 2003, p.119-120)

Carvalho (2003) concludes that only half of the Brazilian parliamentarians were more inclined to particularist practices, and correlates this characteristic with a dominant voting pattern, whether concentrated or fragmented. The other half, on the other hand, with a shared voting pattern, also independent of fragmentation, is attributed a stronger role in universalist agendas, using position-taking as a strategy before their electorate.

3 Method

The survey data were obtained from the TSE’s Repository of Electoral Data (BRASIL, 2021) in .csv (comma-separated-values) format, individualized by state, containing the number of nominal votes for each candidate by the municipality and electoral zone.

Data processing was performed in R⁴, software for statistical analysis, since it was necessary to work with a database with 38 variables, or columns, and 9,104,661 observations, or rows.

The methodology used follows the one proposed by Carvalho (2003) in the two sections analyzed here: both in the investigation of the degree of political competition in the municipalities and, consequently, in the different states of the federation and their regions, and the analysis of the different geographical patterns of distribution of the vote of the elected representatives.

In the first case, to analyze municipal political competition, the vote share indices are measured, that is, the percentage of votes given to elected candidates in each municipality. From there the values are totaled by states and by region and compared with the 1998 data brought by Carvalho.

In the second perspective, looking from the individual perspective of the elected candidates, we try to measure the distribution of their frequencies in the four patterns already studied, based on the combination of two variables to be measured: concentration and dominance.

The variable concentration, or inversely, fragmentation, represents the number of

⁴ The source code is available at “https://github.com/livediego/politics/blob/main/geografia_do_voto”

effective municipalities in which elected representatives obtained votes, or in other words, how many municipalities were decisive for their election. To calculate this variable, we use the inverse Rae fragmentation index, also widely used in the literature to determine the number of effective parties in a Chamber of Deputies, for example. According to Borges, Paula, and Silva (2016), the index is given by the following formula: $1 / (\sum C_i^2)$ ($i = 1 \dots N$), where 'C_i' is the contribution of municipality 'i' to the total vote of the candidate in the state⁵.

From the result, we attributed to the index a cut-off value of 7, which corresponds, for example, to a deputy who obtained 35% of votes in the first municipality, and 77% in the first ten municipalities. We, therefore, say that a deputy's vote is:

- concentrated, if the fragmentation index is less than 7;
- fragmented, if the fragmentation index is 7 or higher.

The other dimension to be measured is dominance, which represents the strength of the elected deputies in the municipalities where they obtained votes. That is, this variable depends on the comparison not only of the vote of a given deputy in the various municipalities but also the percentage of votes concerning their opponents. The dominance index, thus, is described by the equation⁶: $\sum i.. n = (v_i/p_i) \times (v_i/V)$, where n = number of municipalities in the state; v_i = number of votes received by the deputy in municipality i ; p_i = total number of valid votes for federal deputy in municipality i ; and, V = total votes received by the deputy in the entire state.

Once the dominance index of each deputy has been calculated, they are ranked according to their position concerning the average. Thus, a deputy is said to have a vote:

- dominant, if its dominance index is greater than the average;
- shared, if its dominance index is smaller than the average.

From the combination of the two analyzed dimensions, we can then group the voting patterns of the deputies into four categories: concentrated/dominant (C/D), concentrated/shared (C/S), fragmented/dominant (F/D), and fragmented/shared (F/S).

Once categorized, the data are aggregated by state, region, and party, from which comparisons are made among themselves and also concerning the values obtained by Carvalho in the 1994 and 1998 elections.

4 Results and Discussion

The data set analyzed is based on the pattern of concentration/dominance of the votes of the elected deputies. Table 1 shows the distribution of these values across all the states of the

⁵ As with Carvalho, the present study refrained from normalizing the index according to the pattern of distribution of the electorate in the various states, since according to the author, this procedure is irrelevant to the final result.

⁶ Unlike Carvalho, who used the first 15 most voted cities as a proxy for the expected result, we chose to work with the total set of municipalities, that is, with the real situation.

federation, except for the Federal District⁷. Analyzing the data in Table 1, we observe a very large variation in the patterns of concentration/dominance in the different Brazilian States. The most impressive data is right at the extremes of each category.

In the concentrated/dominant pattern, the state with the highest percentage is Acre, with 37.5%, a value almost four times higher than the national average. Still, it is not their predominant pattern, as concentrated/shared votes account for 50% of their candidates. In other words, it is noted that Acre has a large concentration of votes, which is intuitive, considering that it is a state with reduced geographic dimensions, which implies a much smaller number of municipalities.

Table 1 – Geographical pattern of votes of federal deputies elected by state (2018)

UF	C/D	C/C	F/D	F/C
AC	37.5%	50.0%	0%	12.5%
AL	11.1%	11.1%	66.7%	11.1%
AM	25.0%	37.5%	37.5%	0%
AP	0%	100.0%	0%	0%
BA	7.7%	10.3%	59.0%	23.1%
CE	4.5%	18.2%	54.5%	22.7%
ES	20.0%	10.0%	50.0%	20.0%
GO	11.8%	17.6%	41.2%	29.4%
MA	5.6%	0%	66.7%	27.8%
MG	9.4%	9.4%	41.5%	39.6%
MS	25.0%	25.0%	12.5%	37.5%
MT	25.0%	0%	50.0%	25.0%
PA	5.9%	11.8%	35.3%	47.1%
PB	8.3%	0%	75.0%	16.7%
PE	8.0%	8.0%	52.0%	32.0%
PI	10.0%	0%	90.0%	0%
PR	16.7%	16.7%	30.0%	36.7%
RJ	6.5%	65.2%	6.5%	21.7%
RN	0%	25.0%	62.5%	12.5%
RO	25.0%	37.5%	12.5%	25.0%
RR	12.5%	75.0%	0%	12.5%
RS	3.2%	3.2%	22.6%	71.0%
SC	6.2%	12.5%	50.0%	31.2%
SE	12.5%	0%	75.0%	12.5%
SP	10.0%	30.0%	2.9%	57.1%
TO	12.5%	0%	62.5%	25.0%
Brasil	10.1%	21.6%	35.2%	33.1%

Source: Elaborated by us based on TSE data, 2021.

⁷ The Federal District has a special characteristic: it has only one municipality, which is mixed up with the Federal District itself. Thus, it is impossible to measure the fragmentation index, unless another measurement unit were used, such as electoral zone or administrative region. Even then, it would be a different measure from the rest of the states, which could generate distortions in the comparison. Therefore, I opted to remove the Federal District from the data set.

In the concentrated/shared pattern, in turn, another small State surprises by its results: Amapá, with 100% of the seats occupied by deputies with this profile. It is, therefore, the State with the fiercest electoral dispute, which is confirmed by the voting data, with an average of 12% difference in votes between each of the eight deputies and their successors in the voting ranking.

At the other extreme is the fragmented/dominant pattern, in which the deputies from Piauí have the predominance, with 90% of their 10 seats. The deputy fits the dominant profile but is concentrated in a few municipalities. Thus, it is the State with the lowest level of electoral competition, since all the elected deputies dominate their electorates, the vast majority in several municipalities.

Finally, the fragmented/shared pattern is characteristic of the State of Rio Grande do Sul, with 71% of its deputies in this category. The second group is deputies with fragmented/dominant votes, with 23%. Fragmentation, therefore, is a striking characteristic of this State.

Going one level up in geography, Table 2 shows the frequency distribution among the observed patterns by geographic region, and also reveals the characteristic pattern of each region, which corresponds to the set of observed values above the national average.

Table 2 – Geographic pattern of votes of elected federal representatives by region (2018)

Region	C/D	C/C	F/D	F/C	Characteristic Pattern
North	15%	40%	23%	22%	CONCENTRATE
Northeast	7%	9%	63%	21%	F/D
Midwest	18%	15%	36%	30%	DOMINANT
Southeast	9%	32%	18%	41%	SHARED
South	9%	10%	31%	49%	F/S
Brazil	10%	22%	35%	33%	

Source: Elaborated by us based on TSE data, 2021.

The data in Table 2 show a great discrepancy among the Brazilian regions, just as it was observed in the states. Only two regions have a single characteristic pattern, namely: the Northeast, 63% fragmented and dominant; and the South, 49% fragmented and shared, patterns corresponding to their most representative states, Piauí, and Rio Grande do Sul, respectively, as seen earlier.

The other regions showed mixed characteristic patterns, with two patterns of concentration/dominance above the national average.

The data from the North, for example, shows a concentrated profile, since 40% of its deputies have a concentrated/shared pattern, but 15% have a concentrated/dominant pattern, above the national average of 10%.

The Midwest region, on the other hand, is characterized by a dominant pattern, since 36% of the region as a whole is in the fragmented/dominant pattern and 18% is in the concentrated/dominant pattern, both values being higher than the national average, although in different degrees.

The Southeast Region, on the other hand, shows itself to be sharing, with 41% fragmented/shared and 32% concentrated/shared, both figures standing out from the national scope.

These different nuances among the Brazilian regions are summarized qualitatively by Table 3, which lists the regions in each characteristic group, based on two clippings: the compared pattern, which takes into account the frequency of the pattern that is furthest from the national average, and the most frequent pattern, determined by the characteristic that is most verified in its own set.

Table 3 – Geographical pattern of votes characteristic of each region (2018)

Compared standard			
C/D	C/C	F/D	F/C
Midwest	North	Northeast	South
	Southeast		

Most frequent pattern			
C/D	C/S	F/D	F/S
	North	Northeast	South
		Midwest	Southeast

Source: Elaborated by us based on TSE data, 2021.

The data in Table 3 confirm what was observed in the previous table, and lead to the definition of the following voting profiles for each region:

- North, of a concentrated/shared pattern, characterized by states with a small number of municipalities, geographically constrained (except for Pará), and great electoral competitiveness;
- Northeast, of a fragmented/dominant pattern, marked by the preponderance of career politicians in the state executive or linked to traditional oligarchic families;
- Midwest, with a dominant pattern, both fragmented and concentrated, also the result of a large electorate in rural areas and clearer informal districts, with low competition and a greater propensity for more parochialist deputies;
- Southeast, of a shared pattern, both fragmented and concentrated, which suggests the preponderance of opinionated politicians and adherents of universalistic practices, both in large urban centers and statewide, in addition to the big vote pullers;
- South, of a fragmented and shared pattern, characterized by deputies with across-the-

board agendas, such as religious, trade unionists, and universalists with votes spread throughout the state.

Another interesting clipping is the division of patterns by political party of elected deputies. Intuitively, one would expect considerable variation, given our multi-party reality. Table 4 illustrates this well.

The data obtained reflect different patterns and intensities in the set of thirty parties that won seats in the Chamber of Deputies. Once again, the extreme cases observed in each pattern deserve to be highlighted, except for parties that had very few votes, in which very high percentages are observed in their indicators.

Table 4 – Geographical pattern of votes of elected federal representatives by the party (2018)

Party	Total	C/D	C/C	F/D	F/C
PT	55	5%	18%	31%	45%
PSL	52	8%	40%	10%	42%
PP	36	6%	8%	58%	28%
MDB	34	9%	6%	71%	15%
PSD	34	6%	12%	50%	32%
PR	32	6%	16%	47%	31%
PSB	32	13%	22%	44%	22%
PRB	29	3%	34%	24%	38%
PSDB	29	21%	14%	34%	31%
DEM	28	7%	21%	43%	29%
PDT	28	18%	14%	32%	36%
SOLIDARIEDADE	13	8%	23%	31%	38%
PODE	11	9%	9%	18%	64%
PTB	10	10%	0%	60%	30%
PSOL	10	10%	90%	0%	0%
PC do B	9	0%	33%	33%	33%
PSC	8	0%	25%	50%	25%
NOVO	8	0%	63%	13%	25%
PROS	8	25%	38%	0%	38%
PPS	7	14%	43%	14%	29%
AVANTE	7	43%	29%	0%	29%
PHS	6	33%	17%	0%	50%
PATRI	5	20%	0%	20%	60%
PMN	3	67%	0%	0%	33%
PRP	3	33%	0%	33%	33%
PV	3	0%	33%	33%	33%
PTC	2	0%	0%	100%	0%
DC	1	0%	0%	0%	100%
PPL	1	0%	0%	100%	0%
REDE	1	100%	0%	0%	0%
Brasil	505	10%	22%	35%	33%

Source: Elaborated by us based on TSE data, 2021.

In the concentrated/dominant pattern, Avante stands out, with 3 of the 7 deputies in this category, equivalent to 43%. One of the three deputies is Pastor Sargento Isidório, the most voted deputy in the State of Bahia, with 323,264 votes, or 4.71% of the valid votes, concentrated mainly in the capital Salvador and its metropolitan region.

In the concentrated/shared pattern, PSOL leads with a frequency of 90% among its 10 representatives. This shows the ideological character of the party, with deputies elected only in the big capitals, such as Rio de Janeiro (4), São Paulo (3), Belo Horizonte (1), and Porto Alegre (1). The other deputy, of a concentrated/dominant pattern, is Deputy Edmilson Rodrigues, who was the most voted deputy in the State of Pará, with 184,042, or 4.65% of the valid votes, mainly in Belém.

In the fragmented/dominant pattern, the most relevant party is the MDB, with 70.6%. This characteristic is observed in all regions of the country, which is explained by the capillarity that the MDB has built throughout its existence, reinforced by its participation in state governments and also at the federal level.

Finally, in the fragmented/shared pattern, of the major parties, PT stands out, which at first got the largest bench in the Chamber, and still constitutes a cohesive party with a strong identification with its electorate, and after 13 years at the head of the federal executive, receives votes spread over several municipalities, and no longer only in large urban centers.

Table 5 provides a qualitative overview of the various party associations concerning the most observed patterns in each of them. The result is presented in descending order of each party's percentage within each dimension.

When one looks at the set of parties that form the different patterns, one comes to interesting conclusions. First, the concentrated/dominant pattern is the most frequent only in parties that elected smaller parties, such as Rede (1), PMN (3), Avante (7), and PRP (3). This is expected, since, as we have seen, this pattern is the least observed at the national level.

When we analyze the concentrated/shared pattern, we observe its greater occurrence in parties known to be ideological, such as PSOL, PCdoB, and PV, which have electoral bases in large urban centers, or newly created parties, such as NOVO and PROS, which still have a low capillarity and manage to get elected in specific localities.

The fragmented/shared pattern reflects an even more interesting fact. In addition to traditional parties such as the MDB, PSDB, and PSB, which have strong electoral bases in different states, parties such as PTB, PP, PSD, PR, DEM, and PSC, also known as "Centrão", are part of this group. This fact reinforces the thesis that a fragmented and dominant vote is characteristic of politicians with trajectories associated with State and Federal governments, which somehow brought improvements to their electoral strongholds.

In short, the parties that form the fragmented/shared pattern are those aligned with causes that permeate the entire population, not only those in urban centers. The group is

composed of parties linked to religious issues, such as PHS, PRB, and DC, to labor causes, such as PT, PDT, and SOLIDARIEDADE, in addition to Podemos, which, despite being new, managed to receive deputies spread throughout all regions of the country. Finally, it is worth mentioning PSL, which, thanks to the “Bolsonaro effect”, managed to get a significant number of votes throughout Brazil, becoming the second largest legislature in the Federal Chamber. This effect had a major impact on the results of the 2018 election, however, regarding the geography of the vote of the various parties, what can be observed is the reaffirmation of what was expected by theory.

Table 5 – Geographical pattern of votes characteristic of each party (2018)

Most frequent pattern			
C/D	C/S	F/D	F/S
REDE	PSOL	PTC	DC
PMN	NOVO	PPL	PODE
AVANTE	PPS	MDB	PATRI
PRP	PROS	PTB	PHS
	PC do B	PP	PT
	PV	PSD	PSL
		PSC	SOLIDARIEDADE
		PR	PRB
		PSB	PDT
		DEM	
		PSDB	

Source: Elaborated by us based on TSE data, 2021.

In short, the parties that form the fragmented/shared pattern are those aligned with causes that permeate the entire population, not only those in urban centers. The group is formed by parties linked to religious issues, such as PHS, PRB, and DC, to labor causes, such as PT, PDT, and SOLIDARIEDADE, in addition to Podemos, which, despite being new, managed to receive deputies spread throughout all regions of the country. Finally, it is worth mentioning the PSL, which, thanks to the “Bolsonaro effect”, has achieved a significant vote throughout Brazil, becoming the second largest legislature in the Federal Chamber. This effect had a major impact on the results of the 2018 election, however, concerning the geography of the vote of the various parties, what can be observed is the reaffirmation of what was expected by theory.

In the last analysis to be done, Table 6 provides a comparison of the overall averages of each pattern observed in the 2018 election with the data obtained by Carvalho (2003) for the 1998 and 1994 elections.

Table 6 – Geographical pattern of general votes (2018/1998/1994)

Region	C/D	C/S	F/D	F/S
Brazil (2018)	10%	22%	35%	33%
Brazil (1998)	16%	31%	35%	18%
Brazil (1994)	17%	29%	32%	21%

Source: 2018: Elaborated by us from TSE data; 1994 and 1998: Carvalho (2003)

Table 6 indicates that at the national level, the concentrated/dominant pattern, which had already been on a downward trend, suffered a major reduction in its percentage between 1998 and 2018, from 16% to only 10%. This implies a serious decrease in the districting characteristic advocated by several political scientists, such as Fleisher (1976), Indjaian (1981), and Dias (1991).

The concentrated/shared pattern also suffers a considerable reduction, from 31% to 22%, going from the second to the third position among the four. This is explained by the change in the configuration of parties previously linked to the large urban centers, notably the PT, which now manage to cover the countryside of the States.

As for the fragmented/dominant pattern, nothing has changed, since the percentage remains the same, 35%, and is still the most frequent among all. This data corroborates all the others analyzed so far, showing that there is still a strong component of oligarchical political power, especially in the Northeastern and Midwestern regions.

On the other hand, the great growth of the fragmented/shared pattern draws attention, since it increased 15 percentage points concerning 98. Besides the greater capillarity already mentioned above, this is probably due to the changes observed in the political process over these twenty years, from an increase in the number of parties to the evolution of electoral rules and the means of communication and information.

In general, what can be observed, then, is the increasing fragmentation of the votes delivered to the elected representatives, which indicates, therefore, a reduction of the digitalization of the Brazilian electoral system, contrary to the predictions made by several scholars.

5 Conclusion

The purpose of this article was to analyze the results of the 2018 elections for Federal Deputy in the context of the geography of the vote. This analysis proved to be very useful in the implementation of important theoretical concepts in the field of political science, besides allowing the identification of certain patterns and singularities observed in the Brazilian political context.

When analyzing the voting patterns obtained by elected representatives and their classification according to the four theoretical categories - concentrated/dominant,

concentrated/shared, fragmented/dominant, and fragmented/shared - it was found that there is a wide variation in the frequency distribution of the patterns across the country, both from a state and regional point of view.

Each region showed a well-defined behavior: the North, concentrated and shared, distinguished by a great competition; the Northeast, fragmented and dominant, with an oligarchic characteristic; the Midwest, dominant, with low competition and more district character; the Southeast, shared, with the predominance of opinion politicians and big vote pullers; and the South, fragmented and shared, of politicians with transversal and universalist agendas that interest the population in general.

In the party clipping, it was possible to verify different nuances concerning the voting pattern. In the analysis of the 30 parties that won seats in the Chamber, the most frequent pattern observed in the number of parties was the fragmented/dominant one, with traditional parties such as MDB, PSDB, PSB, and the so-called “Centrão” (Big Center) parties. In the second place, in the fragmented/shared pattern, we find the largest parties of the new legislature, PT and PSL, in addition to parties of a religious persuasion, such as PHS, PRB, and DC, or labor parties, such as Solidarity and PDT. The third group, of a concentrated/shared character, is composed of parties from the large urban centers, such as PCdoB, PSOL, PV, and PPS, and the recently created PROS and NOVO. The last group, concentrated and dominant, was only more frequent in dwarf parties, such as REDE, PMN, Avante, PRP.

In the final analysis, the totaled data were compared nationally with those raised by Carvalho two decades ago, and it can be seen that the voting pattern is becoming increasingly fragmented and less concentrated. This indicates a decrease in Brazil’s districting, contrary to what early studies on the Brazilian electoral system claimed.

On the other hand, a large number of representatives who dominate their electoral bases are still present, since the dominant-concentrated and dominant-fragmented patterns represent 45% of the total number of elected representatives. In the distributive view, this type of voting is precisely what would stimulate in these representatives “the logic of particularism and the emphasis on pursuing policies with diffuse costs and concentrated benefits” (CARVALHO, 2003, p. 106).

Finally, we leave as a research suggestion the investigation of other variables, such as legislative production, budget amendments, roll-call votes, speeches, questionnaires, and others, to analyze the parliamentary behavior of each geographical pattern to verify if the relationships found in the literature persist today.

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