



## ORIGINAL PAPER

# Single Nationwide Electoral District, Proportionality, and Territorial Representation: a Case Study of the Slovak Parliamentary Elections

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### Abstract

The quantitative analysis focuses on effects of a single nationwide electoral district on proportionality of seats–votes shares (Least Squares Index) and proportionality of territorial representation (advantage ratio index at the individual level and an adaptation of distortion index at the aggregate level) in the Slovak parliamentary elections. The case study concludes that metropolitan area (the Bratislava Region) is strongly over-represented in the Slovak parliament while other regions are under-represented. At the same time, the analysis showed that seats-votes proportionality and proportionality of territorial representation are not necessarily opposing principles. For example, the mechanism of the electoral system to the German *Bundestag* makes clear that it is possible to maintain a high degree of both of them.

**Keywords:** *nationwide electoral district, proportionality, territorial representation, regions, Slovak Republic*

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## Introduction

The quantitative analysis focuses on effects of a single nationwide electoral district on proportionality of seats–votes shares and proportionality of territorial representation. However, single nationwide districts are not very common practice for parliamentary elections at the national level, at least in the context of consolidated democracies. If nationwide districts do occur, such a district is usually either a part of mixed-member electoral system (e.g. in Hungary), or it appears within a higher (e.g. in the Czech Republic until 1998) or a compensation level of list proportional representation electoral system (e.g. in Denmark or Austria). In Germany and to some extent even in the Netherlands, where it is slightly more complicated, one cannot talk about a single nationwide district in the true sense of the word, because this is used to allocate the total number of seats to each party, but the party seats are then allocated to particular regions, or federal states in Germany, in which lists were submitted, in which voters voted and in which seats within a political party are actually allocated.

Thus, among the few cases, where seats are distributed in a single nationwide electoral district during the parliamentary elections, are the elections to the Israeli Parliament, the *Knesset*, and to the Slovak Parliament, the National Council of the Slovak Republic (*Národná rada Slovenskej republiky*), since 1998. Just the Slovak parliamentary elections were chosen as a case study for this analysis, mainly for two reasons: 1) due to the Communist legacy of the Slovak Republic, as this contribution was originally prepared as a paper for the 7<sup>th</sup> International Conference after Communism: East and West Under scrutiny and organized by the Center of Post-Communist Political Studies (CEPOS, see [cepos.eu](http://cepos.eu)), and 2) the Israeli parliamentary elections have already been subject to a similar kind of analysis earlier (see Latner and McGann, 2005), while the Slovak parliamentary elections have not yet been analyzed in this context.

## District magnitude, seats-votes proportionality and territorial representation: a theoretical framework

There is a long-lasting normative dispute among theorists of electoral systems over what electoral rules are more democratic, or fairer. The overarching goal of the presented quantitative analysis is to contribute to this discussion. However, it intentionally avoids the normative way of thinking because such a perspective may distract attention from the intended objective of the study and moreover, there is no clear answer with regard to a fairer (or the fairest) democratic electoral system (see e.g. the already classic scholarly dispute between Lijphart and Sartori and their followers). Instead, the text focuses on the value-neutral concept of the (dis)proportionality of electoral results, both in terms of the allocation of parliamentary seats among political parties (seats-votes proportionality) and in terms of representation of various regions in relation to their electorate (proportionality of territorial representation).

But, it should be emphasized that the presented analysis approaches the issue of territorial (geographic) representation as a form of descriptive representation (Pitkin, 1967), and not in terms of behavior of MPs. Territorial representation, in the context of a electoral system of proportional representation with a single nationwide electoral district, is a strictly empirical issue (cf. Latner and McGann, 2005).

A key variable of electoral systems in terms of their (direct) effect on the degree of seats-votes proportionality is a *district magnitude*, i.e. the number of seats distributed in the given district (Rae, 1971; Taagepera and Shugart, 1989; Gallagher, 1991; Lijphart, 1994, 1999; Shugart, 2000; Colomer, 2004; Benoit, 2001; Charvát, 2010; etc.) Under conditions of electoral systems of proportional representation, which is also the case of the Slovak parliamentary

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elections, it is generally true that the larger the district magnitude, the greater the degree of seats-votes proportionality<sup>3</sup>.

While small electoral districts lead to the so-called manufactured majorities (Rae, 1971: 74-77), large districts make it possible to eliminate potential majority-forming elements of the electoral system and these effects may cancel each other out almost entirely in very large electoral districts (see e.g. Cabada, Charvát and Stulík, 2015: 182-183). Moreover, the relationship between the degree of seats-votes proportionality and the district magnitude is not linear but quadratic (Rae, 1971: 116-118), where the crucial boundary is about seven (Sartori, 1968: 279) or eight seats (Colomer, 2004: 54). Below this imaginary boundary, an increasing district magnitude is reflected in a significant decline in the seats-votes disproportionality. However, if this boundary is surpassed, the level of seats-votes disproportionality is reduced only less significantly. The proportion of received votes and the proportion of distributed seats become more similar in a district distributing about twenty seats (Shugart, 2000; cf. Sartori, 1968: 279).

Nevertheless, election results are not determined solely by the number of votes, but they are the result of "*interaction between people, places and votes*". Thus, they are also influenced by spatial distribution of votes and delimitation of the boundaries of electoral districts (Taylor, Gudgin and Johnson, 1986: 192). Although single nationwide districts provide a high degree of seats-votes proportionality, they tend to be criticized for not forming a (closer) link between the Members of Parliament (MPs) and voters, or rather geographically defined electoral districts. At the same time, the composition of parliamentary representation, which was created within a single nationwide district, does not reflect the territorial composition of the population, because it lacks significant (if any) institutional incentives for formation of territorial (here regional) representation. Instead, one can likely assume a certain degree of capital city bias, or overrepresentation of metropolitan areas in terms of origin of MPs.

Although Latner and McGann (2005), in their study analyzing the geographic representation of the Israeli Parliament, the *Knesset*, and the Dutch lower house, the Second Chamber (*Tweede Kamer*), discovered only slight overrepresentation of metropolitan areas as well as of most peripheral areas at the expense of regions adjacent to metropolitan areas, and they noted that the Parliaments in Israel and the Netherlands are surprisingly, although not perfectly, geographically representative, the Slovak post-electoral discussion highlighted the significant overrepresentation of MPs originating from the metropolitan area, i.e. in our case the Bratislava Region (*Bratislavský kraj*). Thus, we may hypothesize that *the distribution of seats in a single nationwide electoral district leads to overrepresentation of deputies originating from the metropolitan area, the Bratislava Region* (hypothesis H1).

Nevertheless, due to the borders of Slovak regions (see Figure 1) one cannot confirm the conclusions of Latner and McGann (2005) with regard to the overrepresentation of territorial areas and the underrepresentation of areas adjacent to metropolitan areas at this level of analysis. The only region directly adjacent to the Bratislava Region is the Trnava Region (*Trnavský kraj*) in the Slovak Republic. The starting point of further hypotheses will thus be the argument that *overrepresentation of the Bratislava Region was at the expense of all other regions, which are under-represented* (hypothesis H2). But, the significant success of Kotleba's People's Party Our Slovakia (ĽSNS) in the 2016 parliamentary elections, which is the party with a strong background of candidates in the Banská Bystrica Region (*Banskobystrický kraj*), means that we need to adjust previous assumptions with respect to this specific feature of the 2016 elections as follows: *The Banská Bystrica Region in the 2016 elections is an exception in this sense, as this*

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<sup>3</sup> The district magnitude and seats-votes proportionality relationship is reversed in the case of majority electoral techniques; large constituencies lead to extreme disproportionality (see e.g. Taagepera and Shugart, 1989: 23; Lijphart, 1999: 50; Benoit, 2001: 204; Charvát, 2010).

region will not be under-represented due to the success of LSNS in these elections (hypothesis H2a).



Figure 1. Map of regions in the Slovak Republic

Source: [http://extranet.kr-vysocina.cz/download/odbor\\_informatiky/lda\\_v4/\\_cz/04\\_uzemi.htm](http://extranet.kr-vysocina.cz/download/odbor_informatiky/lda_v4/_cz/04_uzemi.htm)

At the same time, it would be possible to argue that, besides LSNS, the Freedom and Solidarity Party (SaS) based predominantly in Bratislava is represented in the National Council of the Slovak Republic in the long term. However, while its presence in the Parliament contributes to the overrepresentation of deputies originating from the Bratislava Region, this overrepresentation would nevertheless be significant even without the presence of SaS in the National Council of the Slovak Republic. Thus, this does not refute the formulation of the previous hypotheses.

Moreover, regarding the functioning of electoral systems it can be further expected that *the smaller is the region in terms of the number of valid votes cast, the lower the level of its under-representation in the National council of the Slovak Republic, except for the Bratislava region* (hypothesis H3).

### Data and methods

The data from the Slovak parliamentary elections were taken from the data archive of the Statistical Office of the Slovak Republic, which is freely available on the website of the Statistical Office (<http://volby.statistics.sk>). Here it is possible to find all the necessary data, i.e. results of the parliamentary elections at all levels (national, regional, district, municipal); list of elected deputies including their party affiliation; register of candidates indicating the nominating political party and their place of residence.

The data was then analyzed with regard to both the degree of seats-votes proportionality and proportionality of territorial representation (distribution of parliamentary seats among individual regions), including a quantification of the level of parliamentary overrepresentation or under-representation of individual regions of the Slovak Republic with respect to the place of residence of individual MPs. In order to capture general trends and eliminate potential one-time specifics of the very last Slovak parliamentary elections held in 2016, the period of the three previous elections to the National Council of the Slovak Republic (held in 2010, 2012 and 2016) was selected for the purpose of this analysis.

### *Seats-votes proportionality measuring strategy*

The concept of seats-votes proportionality shows (at the aggregate level) the extent, in which the seat shares allocated among political parties corresponds to the proportion of votes,

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which these parties obtained in the elections. Perfect proportionality would be achieved, if the party won the same proportion of seats as its share in the total number of votes. However, achieving perfect proportionality is not feasible in practice, mainly due to the indivisible nature of a seat. The presence of disproportionate allocations of seats in all types of electoral systems is not accidental, because all types of electoral systems favor systematically large parties at the expense of small ones. Most of the instruments for measurement of proportionality are conceived in the form of disproportionality indices; their result therefore shows an (aggregated) deviation of the distribution of seats from the electoral support.

In order to measure the degree of seats-votes proportionality, the *Least Squares Index* of Michael Gallagher (1991) was chosen. The main reasons for the preference of the Gallagher's index include the conclusions of Rein Taagepera and Bernard Grofman (2003), according to which the Gallagher's Least Squares Index should be the preferred method for this type of analysis. Similarly, Galina Borisjuk, Colin Rallings and Michael Thrasher (2004) recommend using the Gallagher's index, if the objective of measurement is to determine, how electoral systems affect the distribution of parliamentary seats, because it is significantly more sensitive to specific characteristics of their allocation process and so it is more suitable than the index of distortion of John Loosemore and Victor J. Hanby (1971) (Borisjuk, Rallings and Thrasher, 2004: 58-61).

Least Squares Index (*LSq*) is calculated as follows:

$$LSq = \sqrt{\frac{1}{2} \sum_{i=1}^n (v_i - s_i)^2}$$

Or, first, differences between the percentage of votes ( $v_i$ ) and seats ( $s_i$ ) for each particular party are calculated, these differences are subsequently added together, the resulting sum is divided by two, and then the root is extracted from the obtained result. Values of the Least Squares Index are within the closed interval  $\langle 0; 100 \rangle$ , where the value  $\{0\}$  would mean a perfectly proportional distribution of seats, while the maximum (theoretically) achievable value  $\{100\}$  would in turn imply a maximum disproportionality (all seats would be distributed among the parties, which did not receive any votes in the election, and *vice versa*).

### ***Proportionality of territorial representation measuring strategy***

For measuring the proportionality of territorial representation of individual regions in the national council of the Slovak Republic was chosen the following strategy. Regional affiliation of individual MPs was derived from their "origin", that is from their place of permanent residence (according to the data in the register of candidates). Based on these data, proportions of deputies attributed to the individual regions were calculated for each of the examined elections, and these were then compared with the proportions of valid votes in the individual regions of Slovakia. Disproportionality measurements were carried out on two levels, at the level of individual regions and at the aggregate level.

The rate of over/under-representation at the regional level was measured in relation to the proportion of valid votes in a given region using the so-called *advantage ratio* ( $A$ ), which is normally calculated as the proportion between the obtained seats and the obtained votes of a particular political party. Nevertheless, since proportions of vote and seat gains of regions, and not of political parties, were taken into consideration for the needs of this analysis, the original index was adjusted, where the proportions of MPs with a permanent residence in a specific region ( $s_i$ ) are divided by the proportion of valid votes in the given region ( $v_i$ ).

$$A = \frac{s_i}{v_i}$$

Values of the advantage ratio indicate the degree of overrepresentation and under-representation of the respective region, while the value {1} implies that the proportion of MPs from a particular region occupying seats in the Parliament is the same as the proportion of valid votes cast in this region. Values lower than {1} indicate that the region is underrepresented, while the lower is the value, the higher is the under-representation of the respective region; e.g. the value {0.75} would mean that only 75% of MPs with a permanent residence in the given region occupy parliamentary seats in comparison with the proportions of valid votes cast in this region. Conversely, values greater than {1} indicate overrepresentation, i.e. the proportion of MPs from the given region is higher than the proportion of the electoral participation in the given region. The higher the value is, the greater the overrepresentation of the region; e.g. the value {2,5} would indicate that two and half times more MPs from the given region are occupying parliamentary seats than was the share of valid votes in the region.

At the aggregate level, an adaptation of the strategy for measuring of *malapportionment* designed by David Samuels and Richard Snyder (2001; cf. Charvát, 2015) was selected for measurement of proportionality of the territorial allocation of seats across Slovak regions. David Samuels and Richard Snyder recommended using a modified version of Loosemore and Hanby's *Index of Distortion* (1971). First, the absolute value of the difference between the proportion of deputies residing in the territory of each specific region ( $s_i$ ) and the proportion of valid votes in the same region ( $v_i$ ) is found out, both as a percentage. Then, the (absolute) values obtained in this manner are added up for all regions in these elections, and the result is divided by two.

The resulting value indicates what the proportion of parliamentary seats occupied by deputies from a different region than the corresponding proportions of valid votes is; e.g. the value {25} means that 25% of the total number of deputies came from a different region in comparison with the proportion, which would correspond to a strictly proportional allocation of seats among regions according to proportions of valid votes.

### **Seats-votes proportionality and proportionality of territorial representation in the National Council of the Slovak Republic: main findings**

While the values of the seats-votes proportionality index are among the lower one in the global comparison (cf. Gallagher, undat.) in the case of the Slovak electoral system ( $LSq = 7.46$  in the 2010 elections,  $LSq = 9.58$  in the 2012 elections,  $LSq = 6.10$  in the 2016 elections), the rate of disproportionality of parliamentary representation of individual regions of the Slovak Republic with regard to the permanent residence of MPs is very high. More than 30.5% of deputies in the National Council of the Slovak Republic, who obtained seats in the 2016 elections, came from a different region than what would correspond to the territorial distribution of votes. Two previous elections were slightly more proportional, yet the values of nearly 27.5% (the 2010 elections) and over 25.5% (the 2012 elections) are still extremely high. And if we move to the individual level, we find a significant overrepresentation of the Bratislava region as the metropolitan area at the expense of other regions. In all three examined elections, the proportion of deputies from the Bratislava region was roughly three times higher than the proportion of voters from the Bratislava region in the total number of voters, who cast a valid vote (see Table 1).

**Table 1. Territorial representation in the Slovak Parliament, 2010-2016**  
(according to the permanent residence of the MPs)

Region	Elections NCSR 2010		Elections NCSR 2012		Elections NCSR 2016	
	MPs	A	MPs	A	MPs	A
Banskobystrický kraj	17	0,9467	16	0,9361	18	<b>1,0586</b>
Bratislavský kraj	61	<b>3,0660</b>	58	<b>2,9420</b>	66	<b>3,1084</b>
Košický kraj	13	0,6739	12	0,6295	12	0,6384
Nitriansky kraj	11	0,5382	11	0,5642	11	0,5850
Prešovský kraj	13	0,6715	17	0,8389	9	0,4430
Trenčiansky kraj	10	0,5761	11	0,6201	9	0,5163
Trnavský kraj	14	0,8691	16	<b>1,0093</b>	13	0,8267
Žilinský kraj	11	0,5615	9	0,4392	12	0,5800
<b>MAL</b>	<b>27,4031</b>		<b>25,6295</b>		<b>30,5093</b>	

**Source:** author's own calculations

Interestingly, the overrepresentation of MPs originating from the Bratislava region can be seen in all political parties, including MOST-HÍD, from which eight MPs from the Bratislava region obtained parliament seats in 2010 (of the total of fourteen MPs), then four (out of thirteen) in 2012 and five (out of eleven) in 2016. The only exceptions were the Slovak National Party (SNS) in 2010, from which “only” two members originating from the Bratislava region obtained seats from the total of nine MPs while five MPs came from the Žilina region (*Žilinský kraj*), and the party ĽSNS in 2016 with just one MP from the Bratislava region out of fourteen MPs, however with seven MPs residing in the Banská Bystrica Region. The highest degree of overrepresentation of deputies originating from the Bratislava region can be observed in the party SaS, where twelve out of twenty-two MPs of the party were from the Bratislava Region in 2010, and then ten of eleven MPs in 2012 and fifteen out of twenty-one MPs in 2016. The majority of MPs (eight out of eleven) come from the Bratislava region also in the case of SME RODINA (We Are Family) – Boris Kollár after the 2016 elections.

The assumption of overrepresentation of the Bratislava region (*H1*) at the expense of other regions (*H2*) was thus confirmed. The only exception in this sense is the Banská Bystrica Region in the elections to the NCSR 2016, which – however – corresponds to one of the underlying assumptions (*H3a*), reflecting the success of Kotleba's ĽSNS in these elections, and also the Trnava Region in the elections for the NCSR 2012. In both these cases there was almost perfect (proportional) representation of these regions in the Parliament. At the same time, however, the representation of MPs originating from the Banská Bystrica Region in all three cases approached the ideal of proportionality (0.95 in the elections for the 2010 elections, 0.94 in the 2012 elections and 1.06 in the 2016 elections).

Another interesting fact is that the second least under-represented Slovak region (after the Banská Bystrica region) is the Trnava Region, which is directly adjacent to the Bratislava Region ( $A = 0.87$  in the 2010 elections,  $A = 0.94$  in the 2012 elections and  $A = 1.06$  in the 2016 elections). This finding is in stark contrast with Latner's and McGann's

(2005) conclusions from case studies of Israel and the Netherlands, which on the contrary showed that the highest degree of under-representation in these countries existed in areas directly adjacent to metropolitan areas.

On the contrary, it was not possible to prove the existence of a relationship between the size of the region in terms of the number of valid votes cast by voters and the rate of under-representation (the hypothesis *H3*). The two smallest regions (Trnava and Banská Bystrica Regions) are the least under-represented regions, but already the third smallest region in terms of the number of valid votes (the Trenčín Region; *Trenčiansky kraj*) is one of the three most under-represented regions.

A secondary finding of the analysis is that if there was a shift of candidates on the lists of individual parties through the mechanism of preferential voting, it happened more frequently in case of candidates originating from the Bratislava region. Nevertheless, as such research was not the subject of the presented analysis, this phenomenon was not further analyzed and it will not be addressed here anymore.

However, it needs to be mentioned that the presented analysis is focused “only” on territorial representation at the regional level. A similar analysis, which would be focused on the county level, would likely bring very interesting results. Such an analysis would very probably highlight the overrepresentation of MPs with the permanent residence in the capital city of Bratislava at the expense of other counties, including the fact that three dozen Slovak counties currently do not have any representative in the National Council of the Slovak Republic.

### Discussion

The results of this analysis should not, however, lead to the conclusion that we have to choose between the principles of seats-votes proportionality and proportionality of territorial representation, as this treatise may seem to indicate.\* The proportionality of interparty allocation of seats and the proportionality of territorial representation are not necessarily opposing principles at all times. On the contrary, both can be maximized within a single electoral design.

Inspiring solution of this “dilemma” may be found for example in the electoral system to the *Bundestag* in Germany, namely in the first phase of the seats allocation process. Political parties submit candidate lists at the level of the German federal units (*Länder*), the so-called *Landesliste*, but seats are distributed among political parties proportionally on the basis of the total votes for all party lists, the so-called second votes (*Zweitstimme*), of each party in a single nationwide electoral district, i.e. at the level of the whole of the Federal Republic of Germany. This number of seats, which was allocated to a specific political party, is subsequently distributed proportionally among the individual regional candidate lists depending on the proportion of votes, by means of which these regional lists contributed to the total electoral gain of the given political party (e.g. Saalfeld, 2005; Cabada *et al.*, 2015: 187-188). This provides both a high degree of seats-votes proportionality (in this phase of the process of allocation of parliamentary seats) and a high degree of proportionality of territorial representation in relation to individual federal units, i.e. *Länder*.

However, it must be added that the above-mentioned election design is not an automatic guarantee of proportional parliamentary representation of individual regions

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\* At the same time, the aim of the present text is not to initiate or propose any electoral reform, nor to submit any recommendations for possible adjustment of the Slovak electoral legislation.



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with regard to territorial distribution of voter populations, but it “only” provides a strong impetus for creating the corresponding territorial representation in the Parliament. The overall result will ultimately depend on electoral strategies of both political parties and voters. Political parties sometimes have a tendency to nominate candidates from different regions than in which they stand as candidates to the forefront of regional candidate lists (often from metropolitan areas). At the same time, it also depends on voters and to what extent they will vote for such candidates, or *vice versa*, and to what extent they will vote “against them” (if they will allocate preferential votes to local and regional candidates, who rank lower on the given list of candidates). Another influential factor may also be that although a candidate defending a parliamentary seat may originally come from the region, in which he/she stands in the elections, he/she may have changed his/her permanent residence during the performance of his/her seat and his/her residence is now in the city, which houses the parliament (mostly the metropolitan area).

### **Conclusion**

Distribution of seats in a single nationwide multi-member electoral district, as well as allocation in several regional multi-member electoral districts, both have their own advantages and a number of disadvantages. None of these methods can be described as more democratic and fairer than the other one, because every advantage of one of these designs is immediately offset with some of its disadvantages. The present analysis of political consequences of the current Slovak parliamentary electoral system, for example, showed that the advantage of the electoral system of proportional representation with a single nationwide electoral district in terms of proportional distribution of seats among the political parties is counterbalanced with the absence or presence of very weak institutional incentives for the creation of territorial proportional representation.

At the same time, the analysis showed that these two methods are not necessarily opposing principles. For example, the mechanism of the electoral system to the German *Bundestag* makes clear that it is possible to maintain a high degree of proportionality of election results through allocation of seats at the national level, while simultaneously achieving a high degree of proportionality of representation of deputies from each region. Thus, the mechanism of the German electoral system could be an inspiration for how institutional incentives for these two principles can be maximized within one electoral design: proportionality of interparty allocation of seats due to their distribution within a single nationwide electoral district, and the proportionality of territorial representation due to intra-party distribution of seats among regional candidate lists of individual parties and the candidates included on them. However, such an electoral design is not an automatic guarantee, which would lead to elimination of the current significant (about three times higher) overrepresentation of MPs originating from the Bratislava region in the National Council of the Slovak Republic to the detriment of all other regions.

Finally, this analysis was focused on territorial representation at the level of regions. However, a similar analysis, which would be focused on the level of counties, would likely bring very interesting results as well. Such an analysis would very probably highlight the overrepresentation of MPs with the permanent residence in the capital city of Bratislava at the expense of other counties, including the fact that three dozen Slovak counties currently do not have any representative in the National Council of the Slovak Republic.

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