One need parishes to be parochial: territorial distribution of votes in open list PR systems

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Abstract

This paper investigates if the personal voting characteristic of open list PR systems does lead candidates to pursue the formation of electoral geographical parishes. Are electoral parishes a frequent and good electoral strategy? Literature on the personal voting usually presupposes that, under these systems, they are both. Frequently, arguments tend to see personal voting as not only a probabilistic propensity to entail the parochialization, but as an almost sufficient condition for it. However, we still know very little about the extent to which parishes are a consequence of the personal voting or of the districtalization of the systems. Here, I analyze how candidates' electoral support is distributed across the territory to look how often candidates do have concentrated electoral support and whether it is electorally profitable. In order to accomplish this, I analyze elections to the Lower Chamber in five countries, with results disaggregated at the local administrative level (municipalities) which lies within the countries' electoral circumscriptions. Results suggest that we shouldn't follow common assumptions uncritically, as candidates usually do not have geographical electoral parishes and concentrating the electoral support more diminishes losses of caused by not having spread votes than really do increases electoral performance.

Introduction

Despite the controversy over whether worldwide electoral systems are moving towards the personalization of the electoral choices at the expense of the partisan vote (COLOMER, 2009; KARVONEN, 2010), in fact the literature has been paying increasing attention to this personal dimension of the vote. Be it in systems that adopt the personal vote as a separate choice from the partisan vote (e.g. preferential voting), be it as an informal component of how voters would be growingly making choices even in more closed partisan voting systems (NORRIS, 2002; MARGETTS, 2010; KARVONEN, 2010). However, while we are just beginning to focus our attention on those personalized possibilities of voting systems, plenty of unfortunate consequences have already been imagined for the personal vote (PV).

Probably the most common idea is that PV links candidates more directly to electors, disregarding in some extent the mediation of parties. In different degrees and formulations, this issue has been remarked by numerous diverse authors (AMES, 2001; MAYHEW, 1974; CAIN, FEREJOHN and FIORINA, 1987; CAREY and SHUGART, 1995; BOWLER and FARRELL 1993; SAMUELS, 2001; SHUGART et. al., 2005; among many others). Often, with the additional assumption that such a direct link would have further undesirable impact in the legislative arena and causing, therefore, from the fragmentation of party systems (KATZ, 1986; LIJPHART, 1994, TAAGEPERA, 1994) to the impairment of party strength and cohesion (BLAIS, 1991; KATZ, 1986; PETERSSON et. al. 1999). Furthermore, works have been also investigating the penalties of the PV to political outcomes, such as the focus and quality of implemented policies (HICKEN and SIMMONDS, 2008), the particularism of transfers (RICKARD, 2009), corruption (CHANG & GOLDGEN 2006; KUNICOVÁ & ROSE-ACKERMAN 2005; PERSSON et. al 2003); and also the penalties of PV to different economic outcomes (DIAZ-CAYEROS et. al., 2009; MILESI-FERRETI, MILLESI-FERETTI et. al., 2001).

Permeating most of those arguments about the effects of PV, there is a not always explicit perception that PV leads to the localization of politics, to the breeding of localism and parochialism, through the pursuing of pork barrel politics and/or the delivering of constituency services. Of course, this intuition comes from the concept back to Cain, Ferejohn and Fiorina (1987), whose definition is cited from Fenno (1978): "many activities can be incorporated under the rubric of 'district service' or 'constituency service', but the core activity is providing help to individuals, groups and localities in coping to the federal government (...) Private groups and local governments need assistance in pursuing federal funds". This intuition also melted with the classic theorization of Mayhew about the district system adopted in the USA, besides works as those from Lancaster (1986) and Cain et al (1987). In the end, pork barrel would be a result of members of the chamber (MC) trying to build dominance over their original districts, as there is only one representative for each district. It means that delivering enough resources and services to their localities could, in practice, close future competition and assure reelection of those reelection-seeker sole representatives of districts.

In the context of multi-member PV systems, however, candidates and MCs usually come from much wider electoral circumscriptions and have many more competitors in the legislative arena who also came from the same circumscription. But yet, literature has transposed the idea about the link between PV and pork barrel politics from the American context to the proportional electoral system with open list (PR-Open list), usually relying on the assumption that "to build and maintain a personal base that can set them apart from co-partisan, candidates focus their activities on particularistic distribution" (ALLEN, 2010:4). Forsooth, it is an appealing idea to think that if candidates might rely on their own efforts to get elected, and if they have to face the additional competition of their co-partisans, they will behave in particularistic fashion, looking for particularistic goods to deliver to their clientele. To many authors it seemed just logical and natural, likewise, to think that the particularistic goods per excellence would be the local goods. The clientele per excellence would be geographical ones and, thus, candidates would begin their personalism by delivering service to political homeland (general arguments can be found, for instance, in KATZ, 1986, SHUGART and CAREY, 1995, Shugart et. al., 2005). This was affirmed about many countries using different PV systems, such as Italy (GOLDEN and PICCI, 2008), Colombia (CRISP and INGALL, 2002), Estonia (TAVITS, 2010), Indonesia (ALLEN, 2010) and, largely, about the Brazilian case (AMES, 1995, 2001; PEREIRA and MULLER, 2002, 2003; SAMUELS, 2001; MAINWARING, 1991, 1999). Curiously, however, the same thing was usually not affirmed about other countries with Open-List PR systems such as Finland, Norway or Sweden.

Few of those works, however, have put it as clear as Shugart et. al. (2005). Take for instance one of their statement which is a good representative of this overall interpretation: "Where voters vote on the basis of the personal distinctiveness of politicians, candidates for elective office often seek to advertise the ways in which they will serve local interest" (p.437). The not often asked question, however, is: why? Why should we logically expect such a link between PV and localism? Somehow, particularistic goods automatically became local goods and we didn't notice. Couldn't a candidate compete against co-partisans and against other adversaries using personal but not local attributes or actions, for instance his/her appealing personal attributes, his/her linkage with syndicates, associations, religions, and so on? As we will see, in a formal perspective, it is far from clear why we usually assume this mix of personalism and localism almost as if they were equivalent. PV is institutionally present in somewhat varied electoral systems and can be very differently operated (see COX, 1997, KARVONEN, 2004). We do not know how this personal connection between electors and candidates would happen in contexts different from the single member districts (SMD) that characterize the American system. How the personal connection links to geography in order to open gates to parochialisms and pork barreling. Should we, for instance, rightfully expect localism and parochialization even in a framework that, although operating with a PV mechanism, is not based on numerous small local districts as is the case in the American SMD?

This paper investigates if electoral systems, with the preferential voting type[1] of personal voting (PV), really do encourage geographically localized electoral strategies. More specifically, the formation of electoral parishes to where MC elected by the personal voting system would be prone to deliver pork barrel. I analyze electoral results for national (Lower) Chamber of five countries that adopt PR-Open list: Belgium (2007 election), Brazil (2006), Ecuador (2009), Finland (2007) and Latvia (2011). With results for each candidate disaggregated at the local administrative level (municipalities) that lies within countries' electoral circumscriptions (cantons/states/provinces/regions). The intention is two-folded. First, to verify how often candidates have or not have been presenting geographically demarcated electoral support to where they might try delivering pork, similar to what happens in single member district (SMD) systems. Second, to verify whether this strategy is electorally profitable. In the next section, I further develop the formal theoretical framework about the link between PV and parochialism. Then, in the following section, I verify different angles of the territorial distribution of votes of candidates. In the last session, I finally present multilevel models to assess if and how, in our sample, the strategy of concentrating electoral support geographically has been profitable to earn votes.

Voting for a candidate is voting for a parish service?

According to classic Edmund Burke's paradigm of the free mandate, representatives should be free to pursue the whole national good instead of the particularization of local goods. More or less consciously, much of our tendency to automatically link PV to localism goes back to this canonical political question. It is to say: we are and have been always concerned with the local-national 'classical dilemma', as Pitkin (XXXX) has called it. The question, however, is if candidates and politicians are as interested in localized strategies as we are. Of course the paradigm of the free mandate is only one of the possible normative views of the "good" systems. And of course the word "dilemma" would suggest that local politics have their appeal. Take for instance one possible upside about the link between representatives and single member local districts: legislators may be more accountable because of having a very well delimited and smaller constituency and because this constituency ends up with only one congressman to look

[1] Preferential voting systems are those electoral systems where voters can chose not only the party for which to cast a vote, but also the specific candidate of this party the voter prefers. Notice that preferential voting would be, thus, a subtype of the broader personal voting. A single member district system as in the United States or in the United Kingdom is a personal voting system, as voters have to cast votes for specific candidates, not only parties. But it is not a preferential voting system, as voters cannot chose between different candidates of one same party (see Karvonen, 2004). In general, preferential systems are those that adopt proportional representation with opened list, but could be also some types of majoritarian representation via multimember district (e.g. the Chilean system).

after. But we are usually only interested in the downside: representatives would tend, then, to overemphasize localized interests in the legislative arena due to the direct local connection with the electoral arena (FIORINA, 1997; MAYHEW, 1974).

As afore mentioned, the usual expectation is that personal voting systems do foster personal and particularistic politics. And then, particularism is most often automatically linked to localism. It is certainly a chain of strong assumption, difficult to properly disentangle and then to test. By one hand, of course it is even debatable whether PV would naturally breed particularisms of any type, but let's stay with it for now. It is not my intent to develop this issue and thus I will keep this first part of the statement. I do so because my interest relies in better understanding and assessing the second part of this chain, namely: the linkage between personalism and localism. Put more formally, this anti-burkerian shortcoming is assumed as:

$$PV \rightarrow Paroc_i \rightarrow \ Paroc_f \qquad (1)$$

Where:

PV is the existence of formal/institutional personal voting systems; $Paroc_i$ is the initial incentive (from the electoral system) for politicians to behave in a parochial fashion; $Paroc_f$ is the final outcome: the parochial legislative behavior of legislators.

Theoretically, however, the assumption that personalized voting in general should be expected to breed local politics just as the particular PV in the American system would do, is in fact a case of spurious association. The literature on the American system deals with an electoral mechanism that is at the same time small- district-based and candidate-centered. It is a PV because electors do not have to choose only a party for the House of Representatives but, at the same time, a specific candidate. And it is small-district-based as voter do that choice in a previously given specific local circumscription called district. The problem is that due to this framework, American literature is usually transposed to other countries that adopt any kind of PV despite of those having or not having geographically delimited electoral circumscriptions[2]. To criticize this is to sustain, first of all, my main assumption, as obvious as it may yet sounds: districtalization cannot be taken as equal to personal voting. Nay, put more accurately, they may sometimes be undistinguishable ("equal"), but cannot be confused as the same set of phenomena. Using the set theory, the assumption is that:

$$\mathrm{E}(Dist \cap PV) \neq Dist \cup PV \qquad (2)$$

Where:

$Dist$ is the existence of local voting districts.

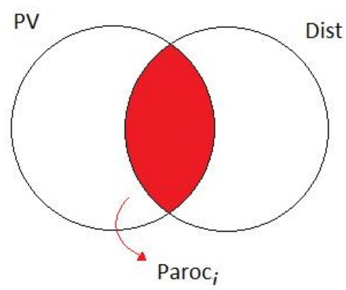
[2] Another important caveat would be the fact that most of the strong statements of the distributive theory regarding the American case inexplicitly depends on the existence of district magnitude = 1. Only in this scenario an elected candidate would be sure to not have legislators competing for future votes in the same electoral area . Thus, the possibility of pork barrel depends on the magnitudes of districts (LANCASTER, 1986). This is a basic logical need for making plausible the giant logroll idea criticized by Krehbiel (1992). Following this logic, as PR systems usually have much greater magnitudes it get much more difficult for a legislator under this system to adopt parochial behavior.

The consequence of not making this differentiation is that literature on electoral systems frequently assumes the supposed effects of localization of politics as being a consequence of the personal vote, not a consequence of the adoption of local-districts system. But while it seems quite straight forward why one *expects* local-district-based systems to foster localization of legislators' interests, pork barrel and parochialism (at least theoretically), it is not that easy to logically argue why personalized voting itself should necessarily cause the same situation. For PV systems to start fostering localism, it may also be required for them to be framed by geographical localized delimitations of the votes, once it is only the localized vote that can lead to localized politics. This argument, that reformulates the first half of proposition (1), can be put as follows:

$$Dist \rightarrow (PV \rightarrow Paroc_i) \because Dist^{\neg} \rightarrow Paroc_i^{\neg} \quad (3.1)$$

Or, to keep with the set theory:

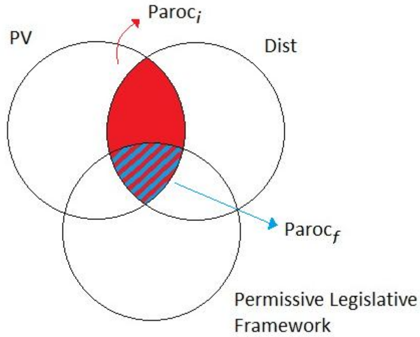
$$Paroc_i \subset (Dist \cap PV) \quad (3.2)$$



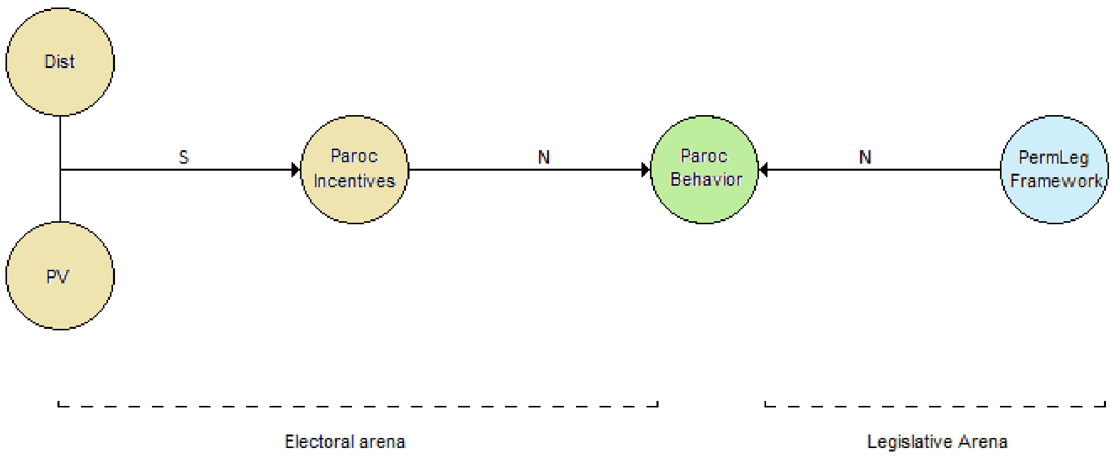
While we still don't know whether the presence of electoral local-districts should be taken as sufficient condition to a parochial political behavior of candidates and of congressmen, it may be in fact a necessary one. Therefore, PV systems can just lead to such behaviors if districtalization is also present. Certainly, nevertheless, by existence of districtalization I do not mean only the existence of legally pre-defined districts as those of the American system. Any sort of PV system could either be district-based by formal design or become locally districtalized in effect. In analogy to Taylor and Johnston (1979) terms, this could happen either if a given system presents *de jure* districts like in USA (pre-defined by law) or if candidates end elections with *de facto* districts: i.e. when the election is not organized in a district-based voting system, but electoral results present patterns of effective geographical concentration of candidates' electoral support.

Now, although both the presence of districts and PV can be seem as necessary conditions for the emergence of parochial electoral politics, it is not difficult to see, however frequently forgotten, why not even their joint presence can be stated as a sufficient condition itself. Such a view of sufficiency would disremember the fact that we can find, and general do find, considerable differences between what happens in the electoral arena and what happens in the legislative arena (BOWLER, 2000; COX, 1987; COX e McCUBBINS, 1993). Both arenas can be strongly disjointed by institutional frameworks of the legislative arena that shape MCs behavior despite of which incentives have emerged from the electoral arena. It means that one thing is to say that legislators elected in local districts might probably prefer parochial politics and pork barrel to deliver there, in order to maximize the chance of electoral outcomes. Another different matter is to say they are really capable to endorse and to carry this desire, given the rules of the legislative game they would eventually face when they take their chairs. That'swhy even the presence of local electoral districtalization is not sufficient, but it is still necessary together with the PV, to strengthen the incentives for parochial behavior. With this, we complete the reformulation of proposition (1), that we started through propositions (3.1) and (3.2), by rewriting its second half:

$$Paroc_f \subset (Paroc_{\,i} \cap PermissiveLeg) \mid Paroc_i \subset (Dist \cap PV) \qquad (4)$$



The causal chain under this statement would look as following:



Where:

$PermissiveLeg$ is the existence of permissive institutional framework for pork barrel-seeking legislators. N is the existence of a necessity relationship and S the existence of a sufficiency relationship.

Given this schema, one can adopt three different logical approaches to verify the link between PV and parochial politics in general. Either to empirically verify if thisoutcomebehavior really does exist at the legislative branch ($\exists Paroc_f$) or to verify if the two conditions for it are present ($\exists Paroc_i$ or $\exists PermissiveLeg$). The usual approach of the literature represented in proposition (1) usually has the afore mentioned issue of spurious association because it resembles the problem of omitted variable bias, as when scholars assume direct relationship between PV and $Paroc_f$, they are disregarding $Dist$ and $PermissiveLeg$. On the other hand, the usual counterargument, for instance in what concerns the Brazilian case, is to sustain that either the final result just does not happen (RICCI, 2003; AMORIM NETO e SANTOS, 2003; FIGUEIREDO E LIMONGI, 1995, 1998; MESQUITA, 2009), or the condition $PermLeg$ is not true (FIGUEIREDO E LIMONGI, 2002, 2005; SANTOS, 2003). Evidently, eventual demonstration of both arguments ($\nexists Paroc_f$ or $\nexists PermissiveLeg$) is enough to what they propose: to demonstrate the insufficiency of the traditional inference represented by proposition (1). But they do not help identifying the size of $\mathrm{E}(Dist \cap PV)$, i.e. the extent to each $Dist$ and PV are related. By one hand, to infer that the electoral system does not create parochial incentives ($\nexists Paroc_i$) only because in the end legislators are proved to not behave parochially ($\nexists Paroc_f$), would incur in the type of formal fallacy known as *denying the antecedent*[3]. By the other hand, to affirm that parochial incentives from electoral systems do not exist ($\nexists Paroc_i$) just because in the legislative arena there is a restrictive framework for those incentives to flourish ($\nexists PermissiveLeg$), would be not only illogical due to the sequence of those events. More than that, relying only on this we would not know what should happen if any changes were made to the intra legislative framework making it more permissive (i.e. $\exists PermissiveLeg$).

Belgium, Brazil, Ecuador, Finland and Latvia are good cases to test if candidate-centered systems do form, and to which extent, electoral parishes. The similar PR-Open list systems of those countries allow us to access this possible feature of PV in a very unique way. By one side, it would be obviously impossible to test it in SMD or multimember districts (MMD) systems because in there PV and $Dist$ always perfectly coexist, so then $\mathrm{E}(Dist \cap PV) = (Dist \cup PV)$, what eludes the assumption made in proposition (2). By the other side, the question would also be meaningless or hard to evaluate in proportional closed list systems, as although we know PV can still informally exist in these electoral systems (NORRIS, 2002), it is formally inaccessible, so $PV = \emptyset \therefore (Dist \cap PV) = \emptyset$. By the other hand, in the PR-Open list the PV is given: in those countries, the votes go first to the parties of chosen candidates to define party chairs, but then go to the candidates to define who of them in each party will take partisan allocated chairs (pooling vote). At the same time, $Dist$ is not given, i.e. there is no *de jure* local districts although it may be possible to exist some *de facto* ones. This is the ideal combination for us to assess $\mathrm{E}(Dist \cap PV)$.

Belgium elected 150 legislators in 2007; Brazil, 513 in 2006; Ecuador, 103 in 2009[4]; Finland, 200 in 2007; Latvia, 100 in 2011. Among those countries, only Finland does not allow voters to cast list votes (i.e. to skip choosing a candidate trough PV): while in the Belgium election of 2007 about 27.9% of the voters cast a list vote, they were 9.8% in Brazil-2006, 33.6% in Ecuador-2009 and 41.9% in Latvia-2011. Other important differences between countries institutions are: Latvia and Ecuador allow multiple voting and Latvia also allows negative voting (which I dropped). There are a few differences between how final votes are summed in the five countries, in order to calculate number of chairs for each party. The greatest is in Ecuador, where

[3] It means: in the alleged situation where the occurrence of X is said to make Y happen, saying that Y not happening is because X did not happen is not necessarily true.
[4] Ecuador also elects 15 legislators using the whole country as electoral circumscription, which I dropped.

votes cast for candidates are counted after being weighted by how many personal votes were cast.

The electoral districts are respectively 10 Belgian cantons, 26 Brazilian federated states, 23 Ecuadorian provinces, 14 Finnish electoral macro-regions and 4 Latvian planning-regions[5]. In the five countries, electoral circumscriptions are not formally local. So, as mentioned, from those systems one can only expect the personal voting to lead to parochial incentives and pork barrel politics if elections end up drawing *de facto* districts across the *localities* that lay inside those bigger and wider electoral circumscriptions. Those localities into which cantons/states/provinces/macro-regions are divided are, respectively: the municipalities in the cases of Belgium, Brazil and Latvia, the administrative parishes in the case of Ecuador[6] and the cities in Finland. It is across those lowest administrative entities of each electoral circumscription of the countries that I will test how often candidates do geographically concentrate votes. Concentration that can be read as the formation of what could theoretically be electoral parishes, the possible *loci* of the legislative parochialism. As explained previously, I am not interested in testing what happens with those parishes, but if they exist and pay off. After all, anyway, one even needs parishes to be parochial.

2 - Spatial analysis

Unfortunately, how much the literature writes about parochialism or pork barrel politics seems to be inversely proportional to the quantity of works on how to empirically define electoral parishes or pork barrels *loci*. Inasmuch, first of all it is a real challenge to approximate the "degree to which individual politicians can further their careers by appealing to narrow geographic constituencies on the one hand, or party constituencies on the other" (SEDDON et. al., 2001:1). Secondly, it is basically hard to even conciliate what is a "narrow geographic constituency" in the many diverse systems. Here, I will build three different measures to access different aspects of the spatial strategy of candidates under PR Open-List systems: one based on spatial autocorrelation (to detect geographical clustering), one based on GINI index (to detect territorial homogeneity of electoral support) and a third one that measures average dominance of candidates over the municipalities.

2.1 - Moran's I

It has been a long time since the field of spatial statistics started developing a variety of technics to assess whether and how much data gets spatially concentrated. I will use some help from there. It is no original proposal: Ames (2001) already used spatial autocorrelation to claim that Brazilian candidates would pursue concentrated electoral support and I will follow a similar path. Indeed, one of the most common approaches is to measure spatial autocorrelation, trough indices like Moran's I, Geary's C Ratio and Global G statistic, which all describe the overall spatial relationship of a given variable across all areal units. Put in a simple form, spatial autocorrelation

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[5] A few notes are needed here. I dropped a 11th Belgian canton, Wallon-Brabant (-5 legislators), and a 24th Ecuadorian province, Galápagos Islands (-2), as both have too few municipalities for the computations in the paper. I also dropped a Brazilian 27th electoral district (city of Brasília, -8), a 15th Finnish electoral district (city of Helsinki, -21), and a Latvian 5th electoral district (city of Riga, -30), as they are single cities-districts and the spatial statistics computed here need study areas divided in municipalities.

[6] Ecuador is actually divided into cities and rural parishes. Urban parishes into which cities are divided are not legally administrative units, nor even having the same representative status and political representation. I follow strictly the Ecuadorian oficial INEC: *Instituto Nacional de Estadística y Censos* (National Institute for Statistics and Census), considering rural parishes and cities as the local administrative units.

means that neighbor observations of the same variable are correlated, thus configuring an autocorrelation in similar sense to its well-known counterpart from panel analysis. But here, in spite of a variable being correlated with itself over time periods it is correlated with itself across areal units in a space dimension. The usefulness of this in order to look for electoral parishes and pork barrel *loci* is that strong positive autocorrelation in space usually reveals spatial concentration of similar values (see Cliff and Ord, 1981; Goodchild, 1991). Thereby, it looks like a good procedure to reveal if *de facto* electoral districtalization does occur.

In this paper I opt to use Moran's I statistic over its similar Geary's C, relying on both its more spread use in the Political Science and on its commonly pointed desirable distributional characteristics (Cliff and Ord, 1981). And over Getis-Ordis' Global G, as Moran's I does not differentiate hotspots and cold spots in the territory, i.e. concentration of high values from concentration of low values. Although this differentiation could be seen as most welcome for my purposes in this paper, as it would avoid false positive detection, at the same time we would incur in the risk of having false negatives, as simultaneous hotspots and cold spots cancel each other in Global G calculation. Therefore, for each candidate in the sample, I calculated Moran's I using as input the percentage of candidate's votes per city. The formula is as follows:

$$I = \frac{n \sum_i \sum_j w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{W \sum_i (x_i - \bar{x})^2} \quad (6)$$

Where:

x_i is the share of votes of a given candidate in "municipality" i; x_j is the share of votes "municipality" j; w_{ij} is the cell value regarding "municipality" i and "municipality" j in the spatial weight matrix W.

For each municipality i in a given W neighbor structure matrix, if municipality j is its neighbor, the formula calculates if the value of variable x in i (x_i) is above or below the mean ($\bar{x}$), and then if variable value of x in j (x_j) is above or below the mean ($\bar{x}$). Then, these deviations of x_i and x_j from the mean $\bar{x}$ are multiplied and all products of deviations of all pairs ij are summed. Here is where the final statistic comes from: for each pair of neighbor spatial units i and j, if their values x_i and x_j are both above the mean $\bar{x}$ or both below the mean $\bar{x}$, the product of their deviation from the mean will be a high positive number. But if x_i is above the mean and x_j is below, or x_i is below with x_j being above, the product of their mean will be a low negative number. That is how the statistic is commonly known to range between -1 to 1[7]. Cliff and Ord (1981) claim this range would mean: -1 = negative autocorrelation (perfect concentration of dissimilar values[8]); 0 = random spatial distribution; 1 = positive spatial autocorrelation (perfect concentration of similar values). Notice, however, that big negative values are, hence, unlikely for our purposes as it is quite uncommon to expect a candidate to have concentration of

[7] It is particularly true in the case of row-standardized neighbor matrices, i.e. when the weight matrix has all values dived by the sum of their rows, so the sum of any row equals 1. This is the case of the matrices used in this paper.
[8] Again, notice that negative values in Moran's I do not mean concentration of low values near each other, as it happens with Global G. It means concentration of dissimilar values near each other.

dissimilar electoral support. I will come back to this point in a moment. Also, it is worth noting that due to the neighbor matrix[9] used in this paper, the index would hardly reach 1 as well[10].

Regarding this spatial matrix, I used an inverse distance neighborhood structure, with distances calculated between borders of municipalities. It means that, for each municipality, the contiguous neighbors have a weight of 1 and the others have diminishing effects according to how far they are from the given municipality. To implement this , I took the polygon maps of countries divided into their lowest administrative level divisions and adjusted these maps for their situation in the years of the elections, using official information on the creation of new cities and merging of old cities. Then, for each of the cantons/states/provinces/regions I calculated the spatial weights. Lastly, to calculate candidates' Moran's I statistic, I run ten thousand Monte Carlo simulations for each of the 2514 Belgian, 4840 Brazilian, 1272 Ecuadorian, 1754 Finnish and 761 Latvian candidates, so the statistics were inferred based on random permutations[11].The first thing we should look for in Moran's I of each candidate is the statistical significance, to discard at a given level of confidence that any pattern found for a given candidate in the sample may be due to randomness. Here follows a summary of the statistical significance of Moran's I of candidates considering p-value < 0.05:

Table 1 – Percentage of candidates with a positive Moran's I with p-value < 0.05

	Elected	Non-elected
Belgium	15.6	6.8
Brazil	64.3	41.2
Ecuador	70.3	34.0
Finland	25.7	13.6
Latvia	42.9	40.7
Overall	47.0	33.5

Table number 1 shows the percentage of candidates that had statistically significant and positive Moran's I. They were, in the overall sample, 47% of the elected candidates and 33.5% of the non-elected candidates. What means that regarding more than a half of the elected candidates and almost two thirds of the non-elected, Moran's I did not detect territorial patterns of electoral support distribution that can be assured as not being random. It is worth noting that,

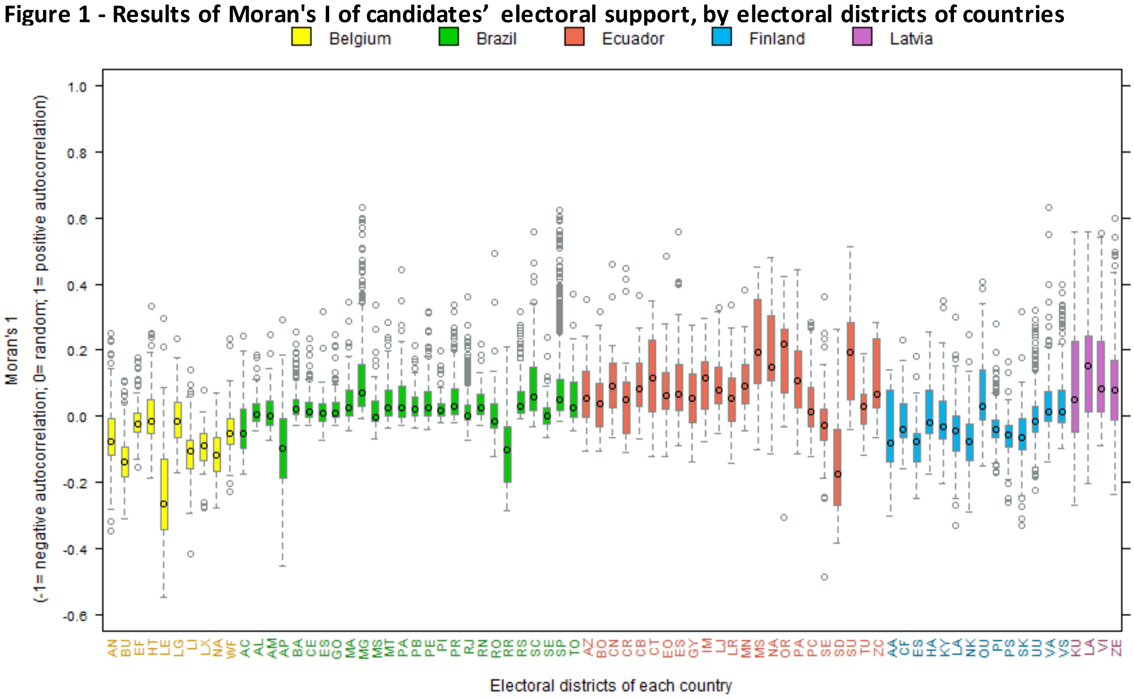
[9] In order to calculate any spatial autocorrelation statistics for any phenomenon, one should input two basic information. First, the target variable value for each spatial area (at the spatial level one wants to test for spatial patterns). Secondly, one needs to specify a spatial weights matrix, i.e. a matrix with the information on the neighborhood structure of those spatial areas. Roughly, in its logically simplest form this matrix defines which spatial area is where, in relation to each other. These neighborhood structures can be of two general types: distance-based and contiguity-based. In the distance-bands type, spatial units that fall within a given distance threshold from each other are considered as neighbors; in distance -k-nearest type the k nearest spatial areas of each spatial area are considered as neighbors. In the contiguity-based type, the spatial areas that share a common boundary or point (Queen contiguity model) or just a common boundary (Rook contiguity), are considered as neighbors.

[10] MCMC simulations with the same type of matrix with random grids have shown Moran's I that ranged mostly between -0.4 to 0.75.

[11] Both calculations of the spatial indices and also of the neighborhood matrices were done by using the *spdep* and *rgeos* packages of the *R* software, version x64 2.15.2. Fine adjustments at the shape polygon maps of the countries were made with *ArcGIS Desktop 10*.

in general, there is a clear pattern of more elected candidates with significant Moran's I than non-elected ones. Belgium and Finland have the lower percentages of candidates with significant Moran's I index, Brazil and Latvia having the greatest and Ecuador being in the middle. But those differences are, rigorously, only suggestive, as methodological and substantive issues could affect how easy or hard it is for a candidate to pass the significance barrier. For example, the number of neighbors and the linking structure of neighbors in each study area (the electoral circumscriptions) where calculations are applied and, of course, the very degree of concentration of population/voters. Not to mention that finding a statistically significant Moran's I tells nothing about the degree of geographical concentration itself, an information that, with the proper caution, would be interesting to see. Therefore, here follows the boxplots of Moran's I statistic of candidates in each of the study areas (electoral districts) of each country:

Figure 1 - Results of Moran's I of candidates' electoral support, by electoral districts of countries

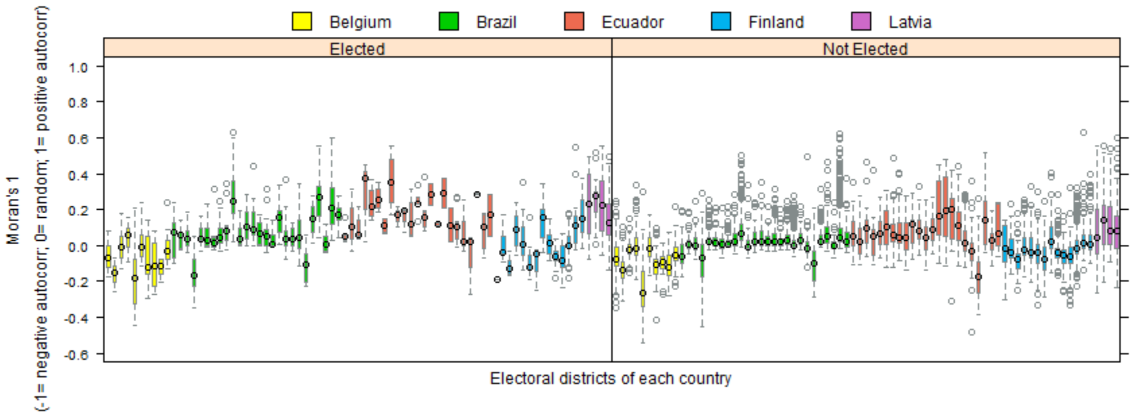


Again, it is essential to keep in mind that each electoral district is a different study area for the calculation of Moran's I, with a singular neighbor structure of its municipalities. And as neighborhood structures are part of the formulae of Moran's I (the W_{ij} matrix), thus affecting the index[12], it is not advisable to directly compare magnitudes of results from one area to another (for a recent example on this discussion, see Van Meter *et. al.*, XXXX). So, what is mostly import to us here is the trend. As one can notice, in general the boxplots' boxes in Figure 1 are above zero in the *y*-axis, and data is concentrated between Moran's I figures of -0.1 and 0.2, i.e. around zero. There seems to be a trend of values being mostly positive but closer to zero, with the lesser part of the variability achieving greater values – especially the outliers. Of course, the

[12] It is easy to see that three or four study areas have fairly low distribution of Moran's I values, completely out of the trend. This is, here, a clear effect of neighbor structures with few municipalities and often with boundaries very close to each other. Neighbor-connections between those inner municipalities tend to make all of them connected, making it harder for Moran's I to detect clustering pattern or in a sensible degree. Although not related with this issue, it is worth noting that those study areas are usually electoral circumscriptions with few cities, few voter and few candidates.

difficulty of interpreting such trend would be anyway related to the common trickiness of deciding what is a strong or a weak value for any statistic. In this case, it is even harder as a Moran's I of 0.1 can mean a somewhat different degree of concentration in different areas depending, again, on the neighborhood structure of each area. But if deciding a threshold is an even harder task for us that it would generally be, it seems plausible to at least assume that according to those boxplots for almost all electoral circumscriptions, having a pattern of *greater* geographical concentration of votes is not the common pattern.

Figure 2 - Results of Moran's I of candidates' electoral support, by electoral districts of countries and by electoral result



In this second Figure, when we group the previous boxplots into "elected candidates" versus "non-elected candidates", the picture changes very little. Actually, it is possible to see that elected candidates had, in general, a less clear trend than defeated candidates. Compare for instance the more horizontal alignment of the medians across the boxplots of defeated candidates to the more erratic line we would need to connect the medians across the boxplots in the "elected" group. What is possible to see without great doubt is that many boxplots are still close to zero but, in comparison to the "not elected" group, almost all of them are a bit higher. In a few of the Brazilian, Ecuadorian and Finnish study areas, this difference is more pronounced. This new evidence may be taken as another indication that elected candidates would tend to have slightly more geographically concentrated electoral support than the defeated candidates.

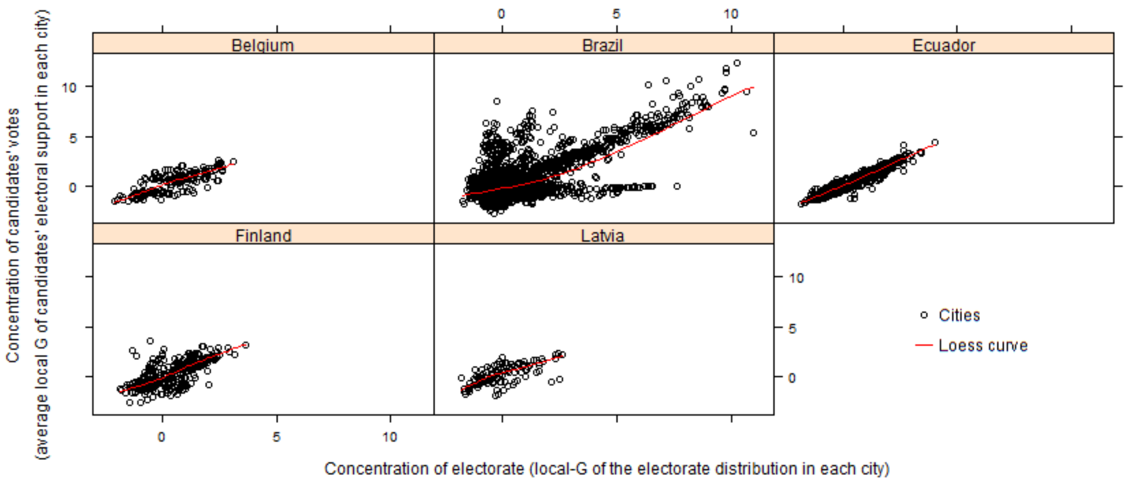
The caution in expressions like "would tend" and "apparently changes" are not adrift. There are two flaws in those kind of analysis that rely only on the basic Moran's I statistic, existent for instance in Ames (XXXX) study using Moran's I. One of them is that victorious candidates may be just concentrating votes in bigger cities, just following the overall geographical concentration of electors. The other flaw is that while spatial autocorrelation measures are ideal to detect geographical concentration of electoral support, they are not accurately apt of measuring the opposite: the spread of electoral support. This is both a substantively important and, as we will see, a methodologically important matter.

2.2 – Local G

Let's deal first with the issue of the impact of the geographical distribution of population/electors on the concentration of electoral support of candidates. I will use here the Anselin (XXXX)'s LISA: local indicators of spatial associations. LISA are local versions of spatial autocorrelation indices (e.g. local Moran's I, local Geary's C), capable of identifying the contribution of each geographical unit (here, the municipalities) to the general spatial autocorrelation of a given study area (here, the electoral districts). Following this path, Getis and Ord (XXXX) have proposed a local version of their global-G statistic, which, following the previously mentioned features of its Global G version, is also able to differentiate spatial clusters of high values (hotspots) and of low values (cold spots). It means, in our case, to differentiate for each candidate the cities in which they concentrate more of their electoral support (hotspots, when local-G > 0) or less of their electoral support (cold spots, when local-G < 0). This time we can chose to use local G instead of local Moran's I, as we are moving the unit of analysis from candidates to city, i.e. disaggregating, so hotspots and cold spots do not cancel each other anymore as in Global G. Accordingly, for all municipalities in a given electoral circumscription (study area) I calculated how much each municipality contributes (its local-G) for the overall spatial autocorrelation of each candidates running in that electoral circumscription. Then for each city, I took the average of local G contributions they gave for candidates. Additionally, for comparison purposes, I also calculated the local-G of the electorate, to get a score of the contribution of each city for the geographical concentration of the population. In all cases, here I used a binary *Queen* contiguity matrix of second order as the spatial weights matrix[13].

Now we can compare if it is true and to which extent that, on average, the cities with more concentration of population receive more concentration of candidates' electoral support:

Figure 3 – Impact of concentration of population in a given city on the average concentration of candidates' electoral support in that city (using local-G)



The scatterplots in Figure 3 positively demonstrate that, on average, the geographical concentration of electoral support of candidates follows the very concentration of the

[13] It is advisable to use binary matrices with Global and Local G (see Getis and Ord, XXXX), and so we could not follow the spatial matrix used with Moran's I.

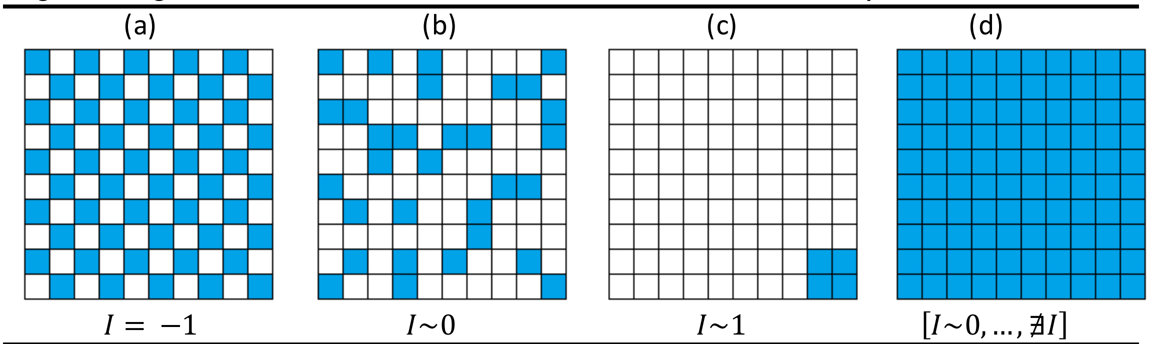
demographic distribution of the electorate across the territory. They mostly seem to be following the votes: concentrating their gathering of votes where there are concentrations of voters. In that sense, it starts getting a bit harder to sustain that the majority of those candidates with more geographically concentrated electoral support would be pursuing the formation of electoral parishes in specific cities, forming *de facto* districts. Now let's move to second issue I mentioned: how Moran's I measures the opposite of geographical conce ntration.

2.3 – Spatial GINI

Though the evidences so far seem to be enough to question the usual assumptions about the automatic link between PV and the parochialization of the elections, mo re workisstill needed. The problem is that, if we proceed to econometric analysis using Moran's I alone as a variable to measure spatial patterns of electoral support of candidates, we would incur in one of two errors, if not in both: measurement error or misspecification. And it has to do with the fact that autocorrelation measures are ideal to detect geographical concentration of votes (taking proximity into account), but are less than ideal to measure the opposite scenario, the spread of votes. The reason for that lies in the trick about what means the lower range of spatial autocorrelation statistics such as Moran's I (i.e. below zero and close to zero).

Remember that, as afore mentioned, neither the negative nor the null autocorrelation do mean homogenization of votes across units. As it is pointed by Lee and Wong (2000): "if the value of one areal unit is above the mean and the value of the neighboring unit is below the mean, the product of the two mean deviations will be negative, indicating the presence of negative spatial autocorrelation". So, negative autocorrelation shows the dissimilaritybetween what happens in two neighbor areas, not the homogeneity. A perfectly homogeneous distribution of votes in a given region equalizes the variable values in all spatial areas, thus the $x_i - \bar{x}$ in the denominator of equation (6) equals zero, and divisions by zero are not allowed. An almost homogeneous distribution of votes in the whole given region approximates thevariable value x_i to mean $\bar{x}$ in that equation for all pairs of spatial areas i and j, so the result of the equation will tend to be tiny. Hence, very close to 0. It is possible to visualize these outcomesby comparing the following schemas:

Figure 4 - Logical outcomes of territorial distribution and how Moran's I is expected to score*



Inspired by the approach of Lee and Culhane (2009)

* Using Rook contiguity, to assess the extreme logical possibilities.

Naturally, it is probably impossible to find electoral geographical patterns thatresemble the chess board-like schema (a) in this figure. Indeed, it might also be very difficult to findeven approximate configurations, as a candidate with a similar electoral support would need to have above-mean electoral support in a city, below-mean in the neighbor and then above-mean in the neighbor of the neighbor, and so. Furthermore, the irregular and non-symmetric drawn of boundaries in real maps would sometimes make it even harder to have alternation between above-mean and below-mean neighbors. Accordingly, when studying electoral distribution of votes within countries' territory, it is not feasible to expect values of Moran's I to be either systematically below zero or even highly below zero[14]. The more realistic geographic pattern of electoral support that is opposite to the parish-like concentration of votes exemplified in schema (c) would be, then, not (a) but in the worst case (b) and in the ideal case, (d). In both cases, Moran's I approximates zero.

Once spatial autocorrelation statistics doesn't allow for a further differentiation between the more homogeneous voting of schema (d) in figure 2 and random voting in schema (b), if we did not look for an additional measure and proceed to econometric models using only Moran's I as an independent variable, we would be leaving much of the impact of spreading-votes-strategy out of our models. And so, biasing the equation in favor of the parochial-strategy. So, it seems necessary to try another tactic to access the spreading-strategy or, in other words, the homogeneity versus heterogeneity of candidates' electoral support across the municipalities that lay within their electoral circumscriptions. Probably the most accessible and yet reliable option is to apply the concept of the well-known Gini index to the electoral support of each candidate of our sample, across municipalities. In the same way it is routinely done for examination of regional inequalities, but here using percentages of votes of candidates in each municipality of their electoral districts as the input.

In the political science this experience is not new: take for instance the index created by Jones and Mainwaring (2004) to study the nationalization of electoral votes, i.e. territorial homogeneity of votes. It is precisely a Gini-based distribution of the votes of each party across the electoral districts, called PNS (Party nationalization score). Of course, here I would apply the index for each candidate, not only for parties. And across local administrative units of Belgium, Brazil, Ecuador, Finland and Latvia, that are inside electoral circumscriptions. However, Bochsler (2010) has shown that this index, as several others, is biased by the number of spatial units. Consequently, Bochsler proposed a standardized version of this PNS from Jones and Mainwaring (the PNS_s), which also accounts for the differences of total voters in each spatial unit, what is especially important because the original index is based on absolute numbers of votes. Bochsler's formula can look quite frightening, but it actually consists of few terms:

$$PNS_s = \left(2 \, \frac{\sum_{d=1}^{D} \left(T_d \left(\sum_{i=1}^{d} C_i - \frac{C_d}{2} \right) \right)}{\sum_{d=1}^{D} T_d \, \sum_{d=1}^{D} C_d} \right)^{1/\log\left(\frac{(\sum_{d=1}^{D} T_d)^2}{\sum_{d=1}^{D} T_d^{\,2}} \right)} \tag{7}$$

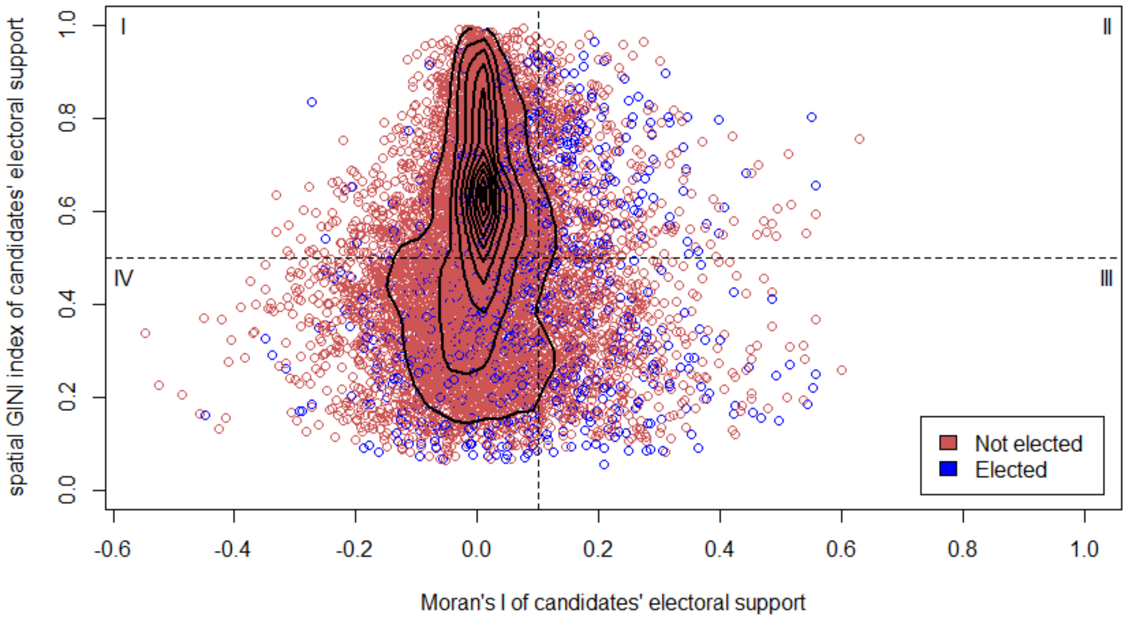
Where:

[14] Actually, even in logical grid spaces as those of figure 4, it seems that in higher orders of neighbor weighted matrices, dissimilar results near each other are increasingly difficult to be differentiated from random spatial pattern. Hence, schema (a) scores a negative Moran's I far from zero only when using a Rook contiguity matrix of order 1. Queen contiguity matrices of any order or Rook contiguity with orders greater than 1 give, in practice, scores close to zero.

D is the total number of districts d; T_d is the total number of voters in each district d; C_d is the votes cast for each candidate C_i in each district d.

I only modified the calculus by subtracting results from 1, in order to invert the meaning so it becomes more similar to that of Moran's I. So, our standardized spatial Gini will score 0 for a candidate with perfectly homogeneous territorial distribution of his electoral support, i.e. with equal percentage of votes in every city (zero spatial inequality=homogeneity). And a candidate with a totally concentrated voting across municipalities will score 1 (total spatial inequality=perfect heterogeneity). But right now, even more important than the levels of the scores is to have a glance at how this index relates to Moran's I in our data:

Figure 5 – Spatial GINI and Moran's I of all candidates



Some of our findings are reinforced. First, the black contour, displaying the two-dimensional kernel density estimation, confirms that Moran's I scores of the overall candidates are generally concentrated in the left part of the *x*-axis, *close to* zero. Second, it is possible to once more demystify the differences between elected and defeated candidates, as both red and blue dot-clouds mostly overlap and with concentration towards the Moran's I value of zero. This helps to clarify the blur of the erratic trend of boxplots as we have seen previously. Third, it is possible to see that our suspicion was right: when values approximate zero in the *x*-axis, values vary quite a lot in the *y*-axis. What is the same as saying that candidates with lower values of Moran's I in our sample tend to have very different patterns of territorial distribution of electoral support in what regards the degree of homogeneity. Actually, the variation of this part of the *x*-

axis in the y-axis is symmetrically well distributed with greater concentration in the middle-up part of the y-axis.

The thresholds that divide the figure into quadrants are entirely arbitrary, only for visualization purposes. But notice that threshold chosen for the vertical dot line was not restrictive: 0.1. Even though, the minority of the cases lay on the right of the line: only 15.8%. We could say that the vertical movement towards the quadrant IV (where spatial GINI ~ 0 and Moran's I ~ 0) represents the strategy of spreading votes geographically, of looking for homogeneous electoral support across municipalities (the schema [d] of Figure 4). In this quadrant, it is possible to find 35.6% of all candidates. The horizontal movement towards quadrant II (where spatial GINI ~ 1 and Moran's I ~ 1) represents the strategy of concentrating votes geographically, parish-alike (equivalent to schema 4.c). Only 6.6% of all candidates are in this quadrant. Finally, in quadrant I, with 48.6% of all candidates, we can find candidates with territorial patterns of electoral support that are random or scattered. In quadrant III we have suspicious cases of greater geographical concentration, but which have greater chance of being caused only by neighbor structures or even by the population distribution.

So far, we have seen that the majority of candidates do not have statistically significant Moran's I. An even greater majority has Moran's I close to zero. Although It is easier to find significant geographical concentration among victorious than among defeated candidates, their overall pattern is not greatly different. Actually, when we cross Moran's I and spatial GINI to look at the relationship between territorial concentration and territorial homogeneity, elected and non-elected tend to overlap. The combination of high Moran's I and high spatial GINI is uncommon. Not to mention that we have found strong relationship between the cities where candidates do concentrate more votes and the cities where the population is concentrated. We have all signs, consequently, to conclude that forming electoral parishes is an exception, not the rule, under the Open List systems included in our data.

However, even not being the dominant strategy, we still have to test if the formation of electoral parishes is a profitable strategy. One thing is to say that it is not common; another is to claim that it doesn't pay off. A priori, both strategies could be electorally profitable, and now we wave better tools to verify this, measuring both movements (towards quadrant II and toward quadrant IV) together and even trough interaction. That is what I am going to model next.

Statistical models: do parishes pay off?

In order to model the electoral impact of different spatial patterns of electoral support, our response variable is going to be the final percentage of votes of each candidate in the whole electoral circumscription. The cases of analysis, thus, are the candidates. As the variable "share of votes" is a percentage, I use its log-transformed version. The main explanatory variables we are interested in are both Moran's I and spatial GINI, as used in the previous section. The hypothesis is that both increase share of votes earned by candidates, i.e. Moran's I is expected to have a positive sign and spatial GINI is expected to have a negative sign (i.e. lower the territorial homogeneity, lower the share of votes earned). I am also including the interaction term between candidates' Moran's I * spatial GINI. Previous figure 5 indicates this possibility, as it seems that both statistics do not have strong correlation between them, what avoids importing previous multicollinearity. The expected sign is positive, meaning that when both measures are positive and with higher values (quadrant II in the last figure), there is an additional impact on candidates' share of votes.

As we have seen that Moran's I can greatly vary from one electoral circumscription to another, from its expected values to its meaning, I opt to run Multilevel Models. This seems to be the better way to deal with the potentially hazardous differences between study areas, as we can isolate in the 2nd level error term as much error or variance caused by each circumscription's neighbor structure as possible. So the first level units are the candidates, the second level units are the electoral circumscriptions (cantons/states/provinces/regions) and the third level are the countries. In addition to Moran's I, spatial Gini and their interaction, all three variables at the 1sr level, I use as additional controls: in the 1st level, the share of votes for the candidate's party; in the 2nd level, the number of municipalities, the number of candidates, the electoral magnitudes, the percent of list voting, the population concentration (also measured with Moran's I). Here follows the specification of our 4 models:

Model 1

L1: $$\log(VtsPct) = \beta_0 + \beta_1 Moran_1 + \beta_2 spGINI_2 + \beta_3 Moran * spGINI_2 + \varepsilon \quad (8)$$

L2: $$\beta_0 = \gamma_{00} + \mu_{00} \\ \beta_1 = \gamma_{10} \\ \beta_2 = \gamma_{20} \\ \beta_3 = \gamma_{30}$$

L3: $$\gamma_{00} = \eta_{000} + \pi_{00} \\ \gamma_{10} = \eta_{100} \\ \gamma_{20} = \eta_{200} \\ \gamma_{30} = \eta_{300}$$

Model 2

L1: $$\log(VtsPct) = \beta_0 + \beta_1 Moran_1 + \beta_2 spGINI_2 + \beta_3 Moran * spGINI_2 + \varepsilon \quad (9)$$

L2: $$\beta_0 = \gamma_{00} + \mu_0 \\ \beta_1 = \gamma_{10} + \mu_1 \\ \beta_2 = \gamma_{20} + \mu_2 \\ \beta_3 = \gamma_{30} + \mu_3$$

L3: $$\gamma_{00} = \eta_{000} + \pi_{00} \\ \gamma_{10} = \eta_{100} + \pi_{10} \\ \gamma_{20} = \eta_{200} + \pi_{20} \\ \gamma_{30} = \eta_{300} + \pi_{30}$$

Model 3

L1: $$\log(VtsPct) = \beta_0 + \beta_1 Moran_1 + \beta_2 spGINI_2 + \beta_3 Moran * spGINI_2 + \beta_4 PtyPerformance + \varepsilon \quad (10)$$

L2: $$\beta_0 = \gamma_{00} + \gamma_{01} M + \gamma_{02} N.Candidts \\ + \gamma_{03} pctCloseList + \mu_0 \\ \beta_1 = \gamma_{10} + \mu_1 \\ \beta_2 = \gamma_{20} + \mu_2 \\ \beta_3 = \gamma_{30} + \mu_3$$

L3: $$\gamma_{00} = \eta_{000} + \pi_{00} \\ \gamma_{10} = \eta_{100} + \pi_{10} \\ \gamma_{20} = \eta_{200} + \pi_{20} \\ \gamma_{30} = \eta_{300} + \pi_{30}$$

Model 4

L1: $$\log(VtsPct) = \beta_0 + \beta_1 Moran_1 + \beta_2 spGINI_2 + \beta_3 Moran * spGINI_2 + \beta_4 PtyPerformance + \varepsilon \quad (11)$$

L2: $$\beta_0 = \gamma_{00} + \gamma_{01} M + \gamma_{02} N.Candidts \\ + \gamma_{03} pctCloseList + \mu_0 \\ \beta_1 = \gamma_{10} + \gamma_{11} + \mu_1 \\ \beta_2 = \gamma_{20} + \gamma_{21} + \mu_2 \\ \beta_3 = \gamma_{30} + \gamma_{31} + \mu_3$$

L3: $$\gamma_{00} = \eta_{000} + \pi_{00} \\ \gamma_{10} = \eta_{100} + \pi_{10} \\ \gamma_{20} = \eta_{200} + \pi_{20} \\ \gamma_{30} = \eta_{300} + \pi_{30}$$

Where:

Y = percentage of total votes a candidate have in the whole electoral circumscription; X_1 = results of Moran's I statistics; X_2 = results of standardized spatial Gini; Q= the control variable: number of cities in the whole electoral circumscription.

And now, the results:

Table 2 – Multilevel Models of the impacts of candidates Moran's I and spatial GINI on candidates' electoral performance

Fixed Effects	Model 1		Model 2		Model 3		Model 4	
For **Intercept**	-5.17 (0.38)***		-4.94 (0.44)***		-5.27 (1.93)***		-5.24 (0.27)***	
M(magnitude)					-0.08 (0.00)***		-0.08 (0.01)***	
N.Candidts					0.00 (0.00)		0.00 (0.00)	
pctClosedList					0.22 (0.62)		0.36 (0.94)	
N.Cities							-0.00 (0.00)*	
PtyPerformance					11.29 (0.15)***		11.28 (0.15)***	
For **Moran** slope	2.38 (0.44)***		3.59 (1.63)**		1.56 (1.39)		-1.32 (0.59)**	
N.Cities							0.04 (0.00)***	
For **SpGINI** slope	-1.78 (0.12)***		-3.42 (1.21)***		-2.06 (0.46)***		-2.24 (0.32)***	
N.Cities							0.00 (0.00)	
For **Moran** * **SpGINI** slope	7.19 (0.89)***		2.84 (1.81)		2.68 (1.46)*		4.83 (1.16)***	
N.Cities							-0.03 (0.00)***	
Random Effects	Var	Std.Dv	Var	Std.Dv	Var	Std.Dv	Var	Std.Dv
Intercept	0.95	0.97	2.01	1.42	0.31	0.56	0.38	0.62
Moran			9.33	3.05	6.86	2.62	0.00	0.00
SpGINI			3.80	1.95	1.46	1.21	1.58	1.25
Moran *SpGINI			38.12	6.17	22.84	4.78	1.72	2.17
Residual	2.94	1.70	2.55	1.60	1.68	1.29	1.67	1.29
Model fit	AIC	BIC	AIC	BIC	AIC	BIC	AIC	BIC
	40635	40686	39635	39729	35227	35350	35160	35312

Notice that I present here one random intercepts model (the number 1) and then three random intercepts and slopes models. Model 2 only introduces the random slopes, thus introducing the level 2 effects on our main three variables. Model 3, in comparison, additionally includes almost all of our controls. Model 4, lastly, also includes the control of the number of cities of each electoral circumscription. It is also our cross-level control, to better model the differences among area and, also, to account for the discrepancy areas: those few where Moran's I was seemingly out of pattern in the boxplots in our first figures. Remember that all discrepant areas had few cities. Results are very consistent for the impact of spatial GINI index on electoral performance of candidates: the lower the homogeneity, lower share of overall votes they get. But of course, caution is needed with the interpretation as we also have interaction terms with this variable and Moran's I. Hence, we can more accurately affirm that when Moran's I is low, more territorial homogeneity earns more share of votes (the movement toward the quadrant III, in our previous schema). About the inverse scenario, when spatial GINI is close to zero, Moran's I have inconsistent results across the four models. It has a positive sign and is statistically significant in the first two models, without controls. Then it becomes non-significant or significant and negative after controls are included (models 3 and 4, respectively). Taking our model with best fit, number 4, as reference, it seems that as spatial GINI index decreases (better territorial homogeneity), greater Moran's I results in worse electoral performance. This suggests that between territorial homogenization and geographical concentration, the impact of first in greater than the impact of the second.

About the interaction term between spatial GINI and Moran's I, it is especially important because when spatial GINI and Moran's I move towards 1, the interaction detects detecting the movement towards quadrant II in our previous design. The results of the interaction term are more consistent, always presenting a positive sign and apparently quite strong coefficients. It is true that the inclusion of random slopes lowers significantly the slope of the interaction (compare models 2 and 3 against 1), but in our model of best fit (number 4), it increases again. Such consistent result appears to be a clear indication that the geographical concentration of votes increases electoral performance of candidates. Nevertheless, it is also worth noticing that the coefficient of Moran's I * spatial GINI (4.83) is partially canceled by the sum of the first order coefficients of Moran's I (-1.32) and of spatial GINI (-2.24), when Moran's I ~ 1 and spatial GINI ~ 1. Actually, even if we fix both as equal 1, in no one of the 77 electoral circumscriptions in the level 2 the joint combination of the equation terms[15] where Moran's I or spatial GINI appear in model 4, is greater than zero. We could call this combination of terms as the overall spatial contribution for the electoral performance of candidates. And this spatial contribution, in practice, only increases electoral performance when spatial GINI is low, i.e. when there is greater homogenization of the spatial distribution of votes. High Moran's I never have the same outcome.

This gives one more clue to our understanding of the importance of the spreading-votes strategy, as it appears that truly, high Moran's are more decreasing the loss caused by a high spatial GINI than increasing performance. What means that: the better and more consistent electoral strategy in the first place is to homogeneous spread the electoral support as much as possible. But if it is to have a territorially heterogeneous distribution of electoral support, than concentrating votes geographically diminishes the loss.

Conclusions

Aiming at the common assumptions about what would be the incentives of electoral systems that adopt the personal voting mechanism, this paper tried to test if candidates in those systems really tend to pursue the formation of electoral parishes in order to be able to further

[15] Take the terms with Moran's I and/or spatial GINI, substitute those variables for their maximum theoretical value, which is 1, then calculate. This will be the overall spatial contribution for the electoral performance of candidates.

deliver pork barrel. Methodologically, I presented the different territorial electoral patterns that can be revealed when analyzing just Moran's I, just territorial homogeneity or even others if we are to consider the impact of both on the electoral performance of candidates. This suggests we should start by being cautious with usual analysis of territorial distribution of votes, as substantive findings can be easily biased by what spatial autocorrelation or territorial homogeneity can measure alone. The integration of both dimensions could be a more promising approach.

Substantively, one first conclusion of this approach as applied to my questions here was that the majority of candidates do not have statistically significant territorial concentration of votes. In what regards the degrees of Moran's I, an even bigger majority scores fairly low in the index, around zero. In general, elected candidates have similar trends to those non-elected. When we improve our measures by crossing Moran's I and spatial GINI it is possible to reinforce the impression that concentrating votes is an exception, not the rule. And even more important, we found that candidates strongly follow the demographic distribution of electors, what means that big part of the small part that concentrates votes, is only follow the geographical concentration of voters.

Secondly, we can at least affirm that different strategies can be profitably pursued in personal voting systems that are not based in local districts. Both concentrating votes geographically and pursuing territorial homogenization may be interesting options. But although it is unclear if geographically concentrating votes has a tendency to improve electoral performance, by the other hand we saw that spreading votes is the better and consistently profitable strategy, while concentrating votes geographically actually only diminishes the losses caused by a geographically non-homogeneous distribution of votes. It means: is the second best option, an option to lessen the losses.

We, thus, have no empirical motivation to presuppose parochial behavior of candidates, while literature usually treats Open-List PR systems as if the dominant (when not the unique) electoral pattern under those systems would be forming electoral geographical bunkers. Hence, it can be affirmed that while there is a non neglectable room for localized strategies under PR-Open List systems, taking this route has been not the systematic choice of candidates and is not the preferable way. These findings suggest that we should be more aware about the meaning and the strength of the incentives we expect from institutions. In conclusion, it is not easy to sustain that PV systems always tend to breed the localization of the political incentives ($Paroc_i$), not to mention the proper final execution of localist outcomes ($Paroc_f$).

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