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## **One needs parishes to be parochial: personal voting and localism 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 establishment of electoral geographical parishes. Are electoral parishes a frequent and a 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 elections to the Lower Chamber in five countries, with results disaggregated at the local administrative level (municipalities) which lies within the countries' electoral circumscriptions (e.g. states, provinces, regions). The aim is to verify the distribution of candidates' electoral support across the territory, to assess how often candidates do have concentrated electoral support and whether it is electorally profitable. Results suggest that we should not follow common assumptions without caution, since many candidates do not have geographical electoral parishes. Concentrating votes is related to the overall geographic concentration of population. The electoral performance of parties is of utmost importance for candidates even under Open List. And spreading votes homogeneously across the territory is at least as profitable as concentrating.

Key-words: electoral parishes; parochialism; spatial autocorrelation; personal voting

### **Introduction**

In this paper, I investigate to which extent personal voting (PV) is in fact related to the formation of electoral parishes. Despite the controversy over whether worldwide electoral systems are moving towards the personalization of the electoral choices at the expense of the partisan vote (e.g. COLOMER, 2009; KARVONEN, 2010), in fact the literature has been paying increased 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 (i.e. preferential voting systems), be it as an informal component of how voters would be increasingly making choices in closed partisan voting systems (NORRIS, 2002; MARGETTS, 2010; KARVONEN, 2010). However, while we are just beginning to focus our attention on such personalized possibilities of voting, plenty of unfortunate consequences have already been imagined for the personal vote.

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 authors (AMES, 2001; MAYHEW, 1974; CAIN, FERREJOHN 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, triggering 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). Scholars 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) and corruption (CHANG & GOLDGEN 2006; KUNICOVÁ & ROSE-ACKERMAN 2005; PETERSSON et. al 2003), as well as penalties of PV to different economic outcomes (DIAZ-CAYEROS et. al., 2009; MILESI-FERRETI, MILLESI-FERETTI et. al., 2001).

Permeating many of these arguments about the effects of PV, there is a rarely explicit perception that PV leads to the localization of politics, to the breeding of localism and parochialism. Of course, this intuition is a descendant of the classic debate on how the American PV would have stimulated pork-barrel practices and constituency-services. The concept was popularized by 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 joined the classic theorization of Mayhew about the district system adopted in the United States, besides other works as Lancaster (1986) and Cain et al (1987): pork barrel would be a result of members of the chamber (MC) trying to build dominance over their original districts, since there is only one representative per district. Delivering enough resources and services to their localities could, in practice, close the future competition and assure reelection of the always reelection-seeker representatives of districts.

However, in the context of multi-member PV systems, 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. Yet, literature has frequently transposed the idea of 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). It means that, since candidates would have to face the additional competition of their co-partisans, they would have to rely more on their own efforts to be elected. To achieve that, they would 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 build their personalism by delivering service and goods to political homeland (general arguments can be found, for instance, in KATZ, 1986, SHUGART and CAREY, 1995, Shugart et. al., 2005). Just as it happened in the single-member PV system of the United States.

This overall logic has been proposed 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)<sup>1</sup>. Few of these works have put this idea as clear as Shugart et. al. (2005). Take for instance one of their statements 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? 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 operated quite differently (see COX, 1997, KARVONEN, 2004). It is unknown how this personal connection between electors and candidates would happen in contexts different from the single member districts (SMD) that characterize the American system. Or how the personal connection links to geography in order to open gates to parochialisms and pork barreling in other types of electoral system: should we rightfully expect localism and parochialization even in a framework that, although operating with a PV mechanism, is not based on numerous small local districts with magnitude one?

Here, I contribute towards answering part of such questions. I analyze electoral results for the national (Lower) Chamber of five countries that use 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, it is 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

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<sup>1</sup>Although, interestingly, the same claim is usually not made regarding other countries with Open-List PR systems such as Finland, Norway or Sweden.

strategy is electorally profitable in comparison to spreading votes territorially. In the next section, I further develop the formal theoretical framework about the link between PV and parochialism. Then, in the following section, I measure the territorial distribution of votes of candidates in two different ways, with an Empirical Bayes Index of spatial autocorrelation and with a weighted regional Gini index. In the last session, I finally present a multilevel model to assess the payoffs of the strategy of concentrating electoral support geographically.

### 1 – Formal theory: voting for a candidate is voting for a parish service?

According to the classic Edmund Burke's normative paradigm of the free mandate, representatives should be free to pursue the wide national good instead of being constrained to pursue the local interests. 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 (1997) has called it. Even so, 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" suggests that, even if frequently forgotten, local politics also have their appeal<sup>2</sup>. However, we are usually only interested in its downside. For instance, when seduced by local politics, national representatives would tend to overemphasize localized interests in the legislative arena due to the direct local connection with the electoral arena (c.f. FIORINA, 1997; MAYHEW, 1974).

As afore mentioned, the usual expectation is that personal voting systems do foster personal and particularistic politics. Subsequently, particularism is most often seemed as automatically bringing localism. This is certainly a chain of strong assumptions, difficult to properly disentangle and then to test. By one hand, it is even debatable whether PV would naturally breed particularisms of any type, but let us stay with it for our purposes here. 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:

$$PV \rightarrow Paroc_e \rightarrow Paroc_l \quad (1)$$

Where:

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<sup>2</sup> 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 after.

*PV* is the existence of formal/institutional personal voting systems; *Paroc<sub>e</sub>* is the incentive from the electoral system for politicians to behave in a parochial fashion in the electoral arena; *Paroc<sub>l</sub>* 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 since voters make such 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 they having or not having geographically delimited electoral circumscriptions<sup>3</sup>. To criticize this is to sustain, first of all, my main assumption, as obvious as it may yet sound: districtalization cannot be taken as equal to personal voting. Put more accurately, they may sometimes be undistinguishable (“equal”), but cannot be confused as the same set of phenomena. Using set theory, the assumption is that:

$$E(Dist \cap PV) \neq Dist \cup PV \quad (2)$$

Where:

*Dist* is the existence of local voting districts.

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, it is not that easy to logically *assume* that personalized voting itself should *necessarily* cause the same situation. Thus, for PV systems to start fostering localism, it may also be required for them to

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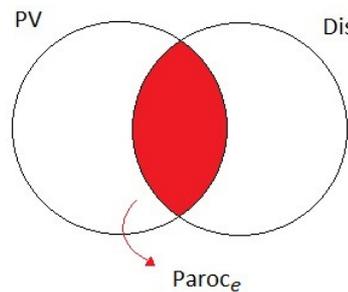
<sup>3</sup> Another important caveat would be the fact that most of the strong statements of the distributive theory regarding the American case in explicitly depends on the existence of district magnitude = 1. Only in this scenario an elected candidate would be sure to not have legislators competing 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 gets much more difficult for a legislator under this system to adopt parochial behavior at the legislative arena.

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:

$$Dist \rightarrow (PV \rightarrow Paroc_e) \therefore Dist^{\neg} \rightarrow Paroc_e^{\neg} \quad (3.1)$$

Or, to keep with the set theory:

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



While we still do not 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 is 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 do not mean only the existence of legally pre-defined districts as the American. Any sort of PV system could either be based a priori on local districts by legal design or become locally districtalized in effect. Using Taylor and Johnston (1979) terms, a given system can present *de jure* districts like in the US (pre-defined by law) or if candidates end elections with *de facto* districts: i.e. when the election is not organized in a small local district-based voting system, but electoral results present patterns of effective geographical concentration of candidates' electoral support.

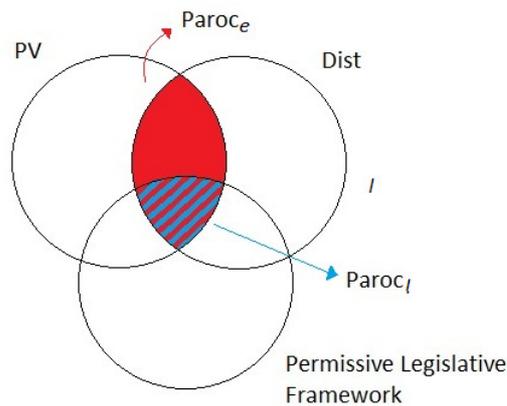
Now, although both the presence of districts and PV can be seen as necessary conditions for the emergence of parochial electoral politics, it is not difficult to see, however frequently forgotten, why not even their joint presence can be stated as a sufficient condition itself for the existence of parochial legislative behavior. 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 their future electoral outcomes. Another different matter is to say they are really capable of endorsing and of carrying this desire, given the rules of the legislative game they would eventually face when they take their chairs. That's why even the presence of local electoral districtalization is not sufficient, but it is still necessary together with the PV, to strengthen the total 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:

$$Paroc_l \propto f(Dist \rightarrow (PV \rightarrow Paroc_e); PermissiveLeg) \mid (Dist^{\neg} \rightarrow Paroc_e^{\neg}; Paroc_e^{\neg} \rightarrow Paroc_l^{\neg}; PermissiveLeg^{\neg} \rightarrow Paroc_l^{\neg}) \quad (4.1)$$

Or to keep with the set theory:

$$Paroc_l \subset (Paroc_e \cap PermissiveLeg) \mid Paroc_e \subset (Dist \cap PV) \quad (4.2)$$



Given this schema, one can adopt three different logical approaches to verify the link between PV and parochial politics. First, to verify empirically if the final outcome really does exist at the legislative arena ( $\exists Paroc_l$ ), or to verify if the two conditions for it are present ( $\exists Paroc_e$  and  $\exists PermissiveLeg$ ). 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, because when scholars assume direct relationship between PV and  $Paroc_f$ , they are disregarding  $Dist$  and  $PermissiveLeg$ . The usual counterargument is usually insufficient as well. Take for instance the counterarguments in literature concerning the Brazilian case. They really on either sustaining that either the final result just does not happen, i.e.  $\nexists Paroc_l$  (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 ( $\nexists Paroc_l$  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  $E(Dist \cap PV)$ , i.e. the extent to which  $Dist$  and  $PV$  are related.

Identifying this can be actually quite important. By one hand, to infer that the electoral system does not create parochial incentives ( $\nexists Paroc_e$ ) only because in the end legislators are proved to not behave parochially ( $\nexists Paroc_l$ ), would incur in the type of formal fallacy known as *denying the antecedent*<sup>4</sup>. By the other hand, to affirm that parochial incentives from electoral systems do not exist ( $\nexists Paroc_e$ ) just because in the legislative arena there is a restrictive framework for these incentives to flourish ( $\nexists PermissiveLeg$ ), would be not only illogical due to the sequence of the 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. creating a case of  $\exists PermissiveLeg$ ).

Belgium, Brazil, Ecuador, Finland and Latvia are good cases to test if candidate-centered systems do form, and to which extent, electoral parishes. The PR-Open list systems of such 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, then  $E(Dist \cap PV) = (Dist \cup PV)$ . 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 inexistent, 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 each party's seats, then go to the candidates themselves to define who 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, but it may be possible to exist some *de facto* ones. So we can control for  $PV$  and see the variation of  $Dist$ , making this the ideal combination for us to test  $E(Dist \cap PV)$ . It is exactly what I will do shortly.

## 2 – Data

Before, it is important to describe a few details about the data used in the following analysis. My sample covers the electoral results of all candidates for the national (Lower)

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<sup>4</sup> 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.

Chamber in five different country/elections that used PR Open List systems. Belgium elected 150 legislators in 2007; Brazil, 513 in 2006; Ecuador, 103 in 2009<sup>5</sup>; Finland, 200 in 2007; Latvia, 100 in 2011. Among these countries, only Finland does not allow voters to cast party-list votes (i.e. to skip choosing a candidate through 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 allows negative voting (which I dropped, considering only the ordinal votes). 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 votes nominally cast for candidates were counted after being weighted by how many personal votes were cast. In total, Brazil and Finland have the purest PR-Open List system, being also almost identical in both countries. The other three countries represent here some variations of the pure formula.

The results for each of the 10340 candidates in the original data are disaggregated at the local administrative level (municipalities) that lies within the countries' electoral circumscriptions (cantons/states/provinces/regions). These circumscriptions are respectively 10 Belgian cantons, 26 Brazilian federated states, 23 Ecuadorian provinces, 14 Finnish electoral macro-regions and 4 Latvian planning-regions<sup>6</sup>. What means that, in the five countries, the electoral circumscriptions are not formally local. So, as mentioned, from these 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. In my data, such localities into which cantons/states/provinces/macro-regions are divided are officially called municipalities in the cases of Belgium, Brazil and Latvia, the administrative parishes in the case of Ecuador<sup>7</sup> and cities in Finland. It is across these lowest administrative entities of each electoral circumscription of the countries that I will test how often candidates do concentrate votes geographically.

### **3–Spatial assessment: one needs parishes to be parochial**

<sup>5</sup> Ecuador also elects 15 legislators using the whole country as electoral circumscription, which I dropped.

<sup>6</sup> A few notes are needed here. I dropped a 11th Belgian canton, Wallon-Brabant (-5 legislators), and a 24<sup>th</sup> Ecuadorian province, Galápagos Islands (-2), as both have too few municipalities for the computations in the paper. I also dropped a Brazilian 27<sup>th</sup> electoral district (city of Brasília, -8), a 15<sup>th</sup> Finnish electoral district (city of Helsinki, -21), and a Latvian 5<sup>th</sup> electoral district (city of Riga, -30), as they are single cities-districts and the spatial statistics computed here need study areas divided in municipalities.

<sup>7</sup> 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 official INEC: *Instituto Nacional de Estadística y Censos* (National Institute for Statistics and Census), considering rural parishes and cities as the local administrative units.

Unfortunately, the size of the literature 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 barrel *loci*. Consequently, it is not only a real challenge to empirically verify 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). It is even hard to conciliate what is a “narrow geographic constituency” in the many diverse systems. Here, I will use two different measures to access different aspects of the spatial strategy of candidates under PR Open-List systems. One is based on spatial autocorrelation (to detect geographical clustering), the other is based on the regional GINI index (to detect territorial homogeneity of electoral support).

### 3.1 –Geographical clustering: Moran’s I through an Empirical Bayes Index (EBI)

It has been a long time since geographical concentration or clustering started to be assessed as the spatial autocorrelation among cases. Put in a simple form, spatial autocorrelation 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 there, 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 *de facto* electoral districtalization 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).

Spatial autocorrelation has been frequently measured through 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. Even in the literature about electoral support, it is no original proposal: Ames (2001), for instance, has already used spatial autocorrelation to claim that Brazilian candidates would have geographically concentrated electoral support. I will follow a similar path. I opt to start from Moran’s I<sup>8</sup>, but instead of working with the traditional formula for this measure I use here the important modification proposed by Assunção and Reis (1999) to “adjust Moran’s I for the variation on population size” (p.2160) among geographical areas. Their version of the index, called Empirical Bayes Index for spatial autocorrelation (EBI), is an improvement over previous measures at least for the field

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<sup>8</sup>I prefer Moran’s I over its similar Geary’s C, due to both its more spread use in the Political Science and to its commonly pointed desirable distributional characteristics (Cliff and Ord, 1981). And over Getis-Ord’s Global G, because 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 at first glance this differentiation could be seen as welcome for my purposes in this paper, since it would avoid false positive detection of electoral parishes, at the same time we would incur in greater (and in my case less conservative) risk of having false negatives, because simultaneous hotspots and cold spots cancel each other in Global G calculation.

of electoral studies, due to the fact that, as we know, voters are usually unevenly distributed across countries' territories.

Therefore, for each candidate in the sample, I calculated EBI using as input the candidate's votes per city. Instead of using the proportion of votes, the index uses the absolute number of votes of a given candidate and of total voters to calculate the deviation of the estimated marginal  $z$ . Then, the formula is as follows:

$$EBI = \frac{m \sum_i \sum_j w_{ij} z_i z_j}{W \sum_i (z_i - \bar{z})^2} \quad (6)$$

Where:

$w_{ij}$  is the cell value regarding "municipality" $i$  and "municipality" $j$  in the spatial weight matrix  $W$ .

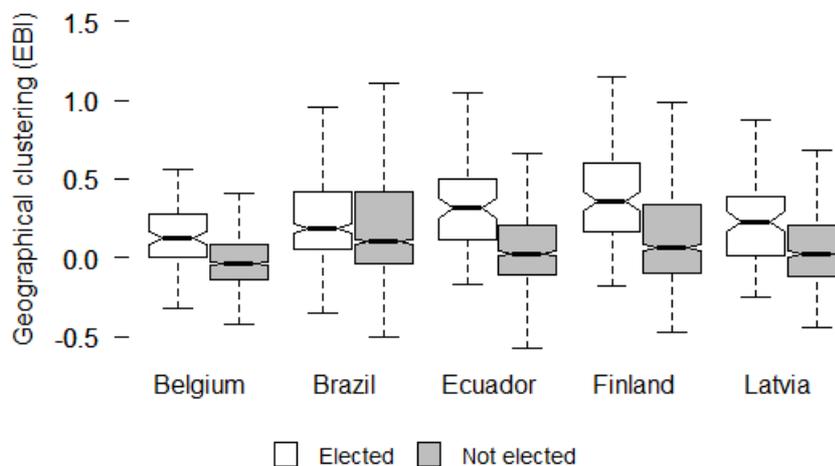
For each municipality  $i$  in a given  $W$  neighbor structure matrix, if municipality  $j$  is its neighbor, the formula calculates how much the votes of a given candidate deviates from the expected by the population distribution. Then, these deviations  $z_i$  and  $z_j$  multiplied and all products 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 deviations  $z_i$  and  $z_j$  are both above or below the expected value given by the population distribution, than their product will be a positive number. But if  $z_i$  is above the expected and  $z_j$  is below, or  $z_i$  is below with  $z_j$  being above, the product of their mean will be a negative number. Similarly to Moran's  $I$ , the EBI will often range between -1 to 1<sup>9</sup> (92% of the cases in my sample), although a few cases may occasionally score above or below, as the measure is not bounded. Following Cliff and Ord (1981), here this range would also mean: -1 = negative autocorrelation (perfect concentration of dissimilar values<sup>10</sup>); 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 since it is quite uncommon to expect a candidate to have concentration of dissimilar electoral support. I will come back to this point in a moment.

<sup>9</sup> It is particularly true in the case of row-standardized neighbor matrices, i.e. when the weight matrix has all values divided 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.

<sup>10</sup> 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.

Regarding the spatial matrix  $W_{ij}$ , I have 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' EBI 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<sup>11</sup>. Figure 1 brings the descriptive summaries.

**Figure 1 – Geographical concentration of electoral support (measured by Empirical Bayes Index) of all candidates, per country and per electoral results**



Note: outliers are omitted for better visualization

Again, it is essential to keep in mind that each electoral district is a different study area for the calculation of EBI, with a singular neighbor structure of its municipalities. And as neighborhood structures are part of the formulae of EBI (the  $W_{ij}$  matrix), thus affecting the index, it is not advisable to directly compare magnitudes of results from one area to another

<sup>11</sup> 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*.

(for a recent example on this discussion, see Van Meter *et. al.*, 2011). Although this figure is aggregating the study areas (electoral circumscriptions) of each country, the note of caution is still valid. Therefore, the most important here is the trend. As one can notice, in general the boxplots' boxes in Figure 1 are above zero in the  $y$ -axis, concentrated between 0 and 0.3, i.e. close to zero. Of course, determining which values of EBI are substantially relevant or not, is a matter of subjective decision. Considering the very different neighborhood structures in each study area, it becomes even more difficult. However, it is not negligible that most candidates in all countries have values of EBI that are close enough to zero for the reader to question him or herself whether these electoral supports are something more than randomly distributed across the territories. This is certainly an indication that concentrating votes is, at least, not exactly a unanimous strategy.

Another support for such conclusion is in the reasonably big variation that exists between candidates. It means, the EBI of candidates in all countries, maybe with the exception of Belgium, range from very low, even negative values, to somewhat high positive values. If nothing else, this is an additional evidence that concentrating votes geographically is not a necessary behavior for candidates under PR-Open List systems. By the other hand, in all countries except Brazil it is clear that elected candidates tend to have greater EBI (what means greater degree of geographical concentration of electoral support) than defeated candidates. In Belgium, Finland and Latvia, more than 50% of the elected had greater EBI than at least 75% of the non elected in the sample. In Ecuador, such difference is even more pronounced, with around 70% of the elected having greater EBI than at least 75% of the non elected. Brazil is the only exception, with an almost even scenario between elected and non elected candidates, meaning that precisely in the Brazilian case, which is certainly considered as the paradigm of parochial politics caused by the PR-Open List electoral system, there is not a high probability that an elected candidate picked at random had more geographically concentrated electoral support than a non elected candidate also picked at random.

In any case, of course this is not a formal test yet. The formal assessment will come with the final multi-level model, but before getting there the reader should be made aware of two flaws about relying only on measures of geographical clustering like the EBI to detect the importance of electoral parishes. One of the flaws 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 for measuring the opposite: the spread of electoral support. This is both a substantively important and, as we will see, a methodologically important matter.

### 3.2 – The impact of cities with big population: Local G index

Let's deal first with the issue of the impact of the geographical concentration of population/electors on the concentration of electoral support of candidates. I will use here the Anselin (1995)'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 municipality to the spatial autocorrelation of the electoral support of each candidate in his/her electoral circumscription (state/province/canton). In the same way, Getis and Ord (1992) have proposed a local version of their global-G statistic, which is capable of differentiating 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 he or she concentrates more (hotspots, when local-G > 0) or less of their electoral support (cold spots, when local-G < 0).

This is the option I follow here<sup>12</sup>. 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 candidate. It means, for instance, that we can assess how much, on average, the city of Turku in Finland has contributed for the geographical concentration of votes of candidates that run in the electoral area of Varsinais-Suomen, where Turku is located. Then, I took the average of local G contributions given by each city for all candidates. Lastly, for comparison purposes, I also calculated the local-G of the whole electorate itself, to get a score of the contribution of each city for the geographical concentration of the electorate. In our example, it would mean to assess how much the Finish city of Turku contributes to the demographic concentration in Varsinais-Suomen. In all cases, here I used a binary *Queen* contiguity matrix of second order as the spatial weights matrix<sup>13</sup>.

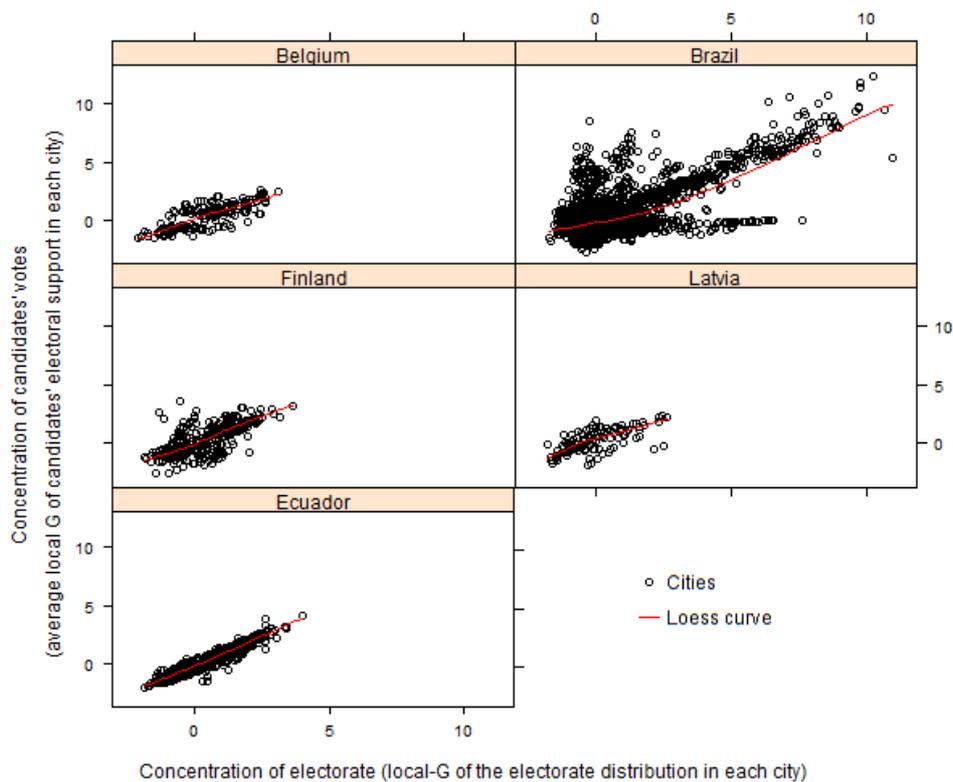
Now we can see whether it is true and to which extent that, on average, the cities with more concentration of population receive more concentration of candidates' electoral support:

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<sup>12</sup>Recall that, before, I have discarded Global G as a good measure, preferring the ones based on Moran's I such as the EBI, because in the Global G the cold and hotspots cancel each other. However, this time we can chose to use local G instead of local EBI or local Moran's I because 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.

<sup>13</sup> It is advisable to use binary matrices with Global and Local G (see Getis and Ord, 1992), and so we could not follow the spatial matrix used with Moran's I.

**Figure 2 – Impact of concentration of population in a given city on the average concentration of candidates' electoral support in that city (using local-G)**



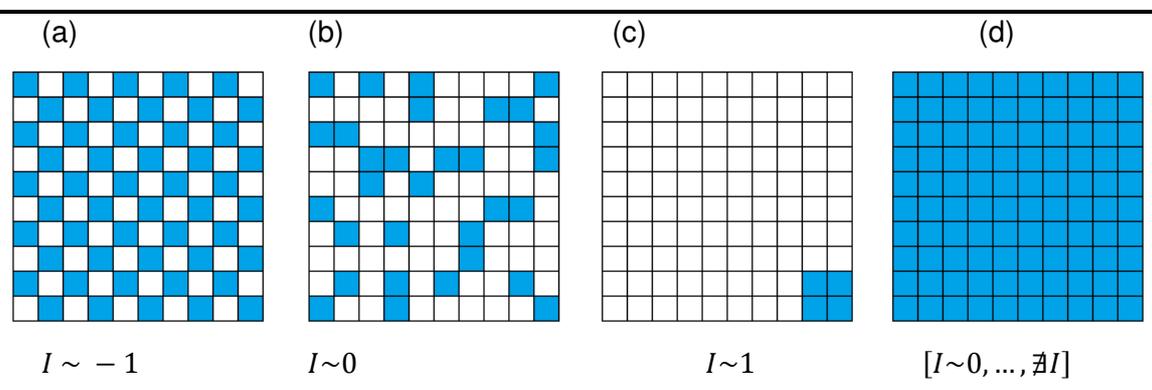
The scatterplots in Figure 2 positively demonstrate that, on average, the geographical concentration of electoral support of candidates follows the very concentration of the demographic distribution of the electorate across the territory. Candidates mostly seem to be following the votes, i.e. concentrating 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 for electoral purposes. Or should one expect that candidates would try to get less votes in the biggest cities on purpose? Now let's move to the second issue I have mentioned above: how spatial autocorrelation is incapable of measuring the opposite of geographical concentration.

### 3.3 – Territorial homogeneity of electoral support: Spatial GINI index

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, more work is still needed. The problem is that, if we proceed to econometric analysis using EBI 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 and misspecification. 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 and EBI (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) when talking about Moran's I, "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 dissimilarity between what happens in two neighbor areas, not the homogeneity. It is possible to visualize these outcomes by comparing the following schemas:

**Figure 3 - Logical outcomes of territorial distribution and how EBI 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 that resemble the chess board-like schema (a) in this figure. Accordingly, when studying electoral distribution of votes within countries' territory, it is not feasible to expect values of measures based on Moran's I, like the EBI, to be either systematically below zero or even strongly

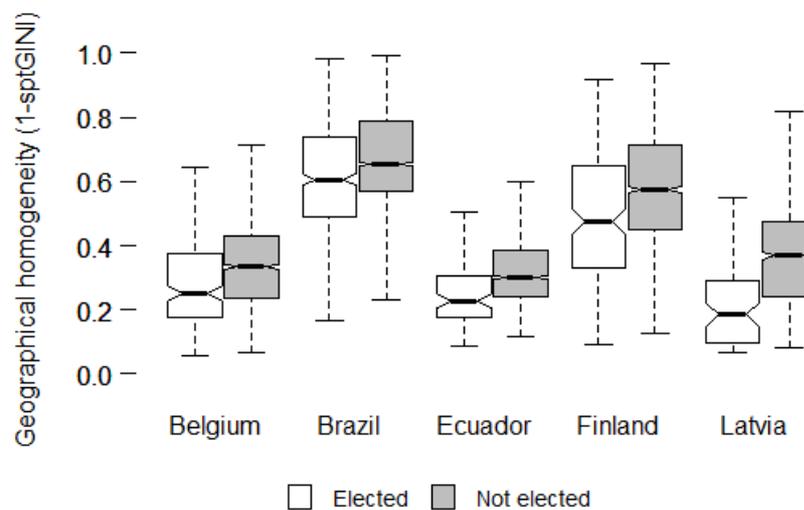
below zero<sup>14</sup>. The more realistic geographic pattern of electoral support that is opposite to the parish-like concentration of votes exemplified in schema (c) would be, then, not (a) but in the worst case (b) and in the ideal case, (d). In both cases, Moran's I and EBI approximate zero. Therefore, since spatial autocorrelation statistics don'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 result. 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 regional Gini index. Here, it would measure the spatial inequality of electoral support of each candidate of our sample, across the municipalities of his/her electoral circumscription. In the same way it is routinely done for examination of regional inequalities, but here using as input the percentages of votes of candidates in each municipality of their electoral districts.

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 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 number of voters in each spatial unit. This is especially important because of what we have just found above - candidates frequently follow the concentration of population in the territory. Hence, our standardized spatial Gini will score 1 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). While a candidate with a totally concentrated voting across municipalities will score 0 (total spatial inequality=perfect heterogeneity). Figure 4 has the descriptive summary of this measure for my sample.

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<sup>14</sup> 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.

**Figure 4 – Geographical homogeneity of electoral support (measured by 1-sptGini) of all candidates, per country and per electoral results**



Note: outliers are omitted for better visualization

Differently from what we saw regarding the EBI, the sptGINI varies quite a lot across countries. Belgium and Ecuador generally have the lower figures, meaning that it is less common in these countries for candidates to achieve very good territorial spread of their electoral support across the municipalities that lay within their electoral circumscriptions. On the other side, Brazil and Finland present the highest patterns, i.e. they are the countries where generally the candidates come closer to spreading their electoral support geographically. Once again it is worth noting that the case of Brazil, usually thought as a paradigm of parochial politics, shows here a different story. At the same time, this figure once again shows a clear pattern of elected candidates having less well spread electoral support than non elected candidates. This is coherent to what we have seen in Figure 1 regarding the EBI. However, once again it is just an indication. But now we have all the instruments we need to move on to the statistical test of whether forming geographical electoral parishes are or not profitable strategy.

#### **4 - Statistical models: do electoral parishes pay off?**

In order to answer this question, I will model the impact of EBI and of sptGINI on the electoral performance of candidates<sup>15</sup>. Both are expected to improve electoral performance. Nevertheless, there are some important challenges to test that. The main difficulty that has prevented further modeling of electoral performance in countries with proportional system is the fact that data regarding these systems are, by definition, compositional (Katz and King, 1999; Honaker and Linzer, 2006). It means that observations (candidates) within a given electoral circumscription are not independent from each other, since the electoral performance of one affects the other's. More than that, if we use the share of votes of candidates as the dependent variable, candidates together sum 1, i.e. they are compositional parts of a total.

The most well-known strategy to deal with such scenario was first introduced in the political science main literature by Katz and King (1999). Researching on the UK, they have proposed a new type of model that works by treating each electoral district as the unit of analysis and each party as an option in a multinomial-like model. The analysis, therefore, has a clear meaning: one party is left out as a reference and the model then talks about what increases or decreases the chance of other parties being chosen in relation to the reference one. In different flavors, this main idea has appeared in other treatments of compositional data in the political science (for a recent example see Linzer, 2012). The problem we face with PR Open-List system, however, is that candidates are never the same across electoral circumscriptions such are parties. And the an additional problem I face here is that using districts as unit of analysis instead of candidates would lose the very information we want to assess.

To address the problem at the level of candidates, I will adapt the original idea of Katz and King (1999) and chose as reference the median candidate of each electoral circumscription of each country. It means that my model will interpret electoral performance of candidate A as the votes earned by A in his/her electoral circumscription in comparison to the candidate that had the median electoral support there in the same circumscription. By doing so, the dependent variable is not a composite of a specific and fixed total anymore. However, candidates of a same circumscription are still certainly related, i.e. are not independent, since what happens to one's electoral performance is still going to affect the other. Then, to make sure we address this problem of non-independence between observations, I will use multi-level modelling, with electoral circumscriptions being the clusters. This will be also helpful to deal with the fact that EBI is dependent on each geographical configuration of municipalities in each area. Using multi-level models means

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<sup>15</sup>Notice that I do not include here the local G used for Figure 2. Recall that in the analysis with the local G measure the unit of analysis were the municipalities, while the statistical model uses the candidates as cases.

trying to isolate in the 2nd level error term as much error or variance caused by each circumscription's neighbor structure as possible. As well as to model the non-independence between candidates.

The Bayesian framework offers the perfect environment to apply such customizations and, specially, to estimate multi-level models with meaningful variation of coefficients per cluster. Here is how the final model (model 3) is specified, where  $Vts$  is the absolute number of votes of candidate  $i$  in his electoral circumscription  $k$ :

$$\ln\left(\frac{Vts_{ik}}{\text{median}(Vts_k)}\right) \sim N(\mu, \nu)$$

$$\mu = \beta_{0k} + \beta_{1k}EBI_i + \beta_{2k}sptGINI_i + \beta_3PctPty_i$$

$$\beta_{0k} \sim N(\theta_0, \epsilon_{0k}), \beta_{1k} \sim N(\theta_1, \epsilon_{1k}), \beta_{2k} \sim N(\theta_2, \epsilon_{2k})$$

$$\theta_0 = \gamma_0 + \gamma_1PctClosedList_k + \gamma_2NCand_k + \gamma_3NMunicip_k$$

$$\theta_1 = \gamma_1, \theta_2 = \gamma_2$$

$$\beta_3 \sim N(0, 0.0001), \gamma_{0:3} \sim N(0, W), \nu \sim \text{Gamma}(0.001, 0.001), \epsilon_{0:2k} \sim \text{Gamma}(0.001, 0.001)$$

$$W \sim \text{Wishart}\left(3, \begin{bmatrix} 1 & & \\ & 0.1 & \\ & & 0.1 \end{bmatrix}\right)$$

As can be seen, besides EBI and sptGINI as the main explanatory variables, I also included additional controls.  $PctPty$  is the percentage of total votes earned by the party of candidate  $i$  at the circumscription  $k$ . It is expected to increase the electoral performance, showing that despite of geographical patterns of electoral support, the partisan label is still crucial.  $PctClosedList$  is the total percentage of votes in a circumscription  $k$  that were cast directly for parties, i.e. from voters who chose not to do vote pooling. It is expected to decrease the electoral performance of individual candidates, because when controlled for  $PctPty$ ,  $PctClosedList$  measures only pooling votes that were lost by all candidates.  $NCand$  and  $NMunicip$  are, respectively, the total number of candidates and the total number of municipalities in a given circumscription  $k$ . Both enter the model not for substantive reasons, but to account for the possibility that EBI or sptGINI may have residual relationship with them. I have specified the random effects on the intercept, on the effects of EBI and of sptGINI on the electoral performance of candidates. For comparison, I will also present the results of two other models (model 1 and 2), that are identical to this above, but either lack sptGINI (model 1) or lack EBI (model 2).

All models were estimated by Bayesian Multi-level techniques, through 4 chains of  $10^5$  iterations each, with the first half burned-in and no thinning. Models pass the usual tests and checks for non-convergence. Estimations were done with the package MCMCpack from the R software. Figure number 5 has the results of the fixed effects of the three models.

**Figure 5 – Multi-level models of electoral performance of candidates (in relation to the median candidate)**

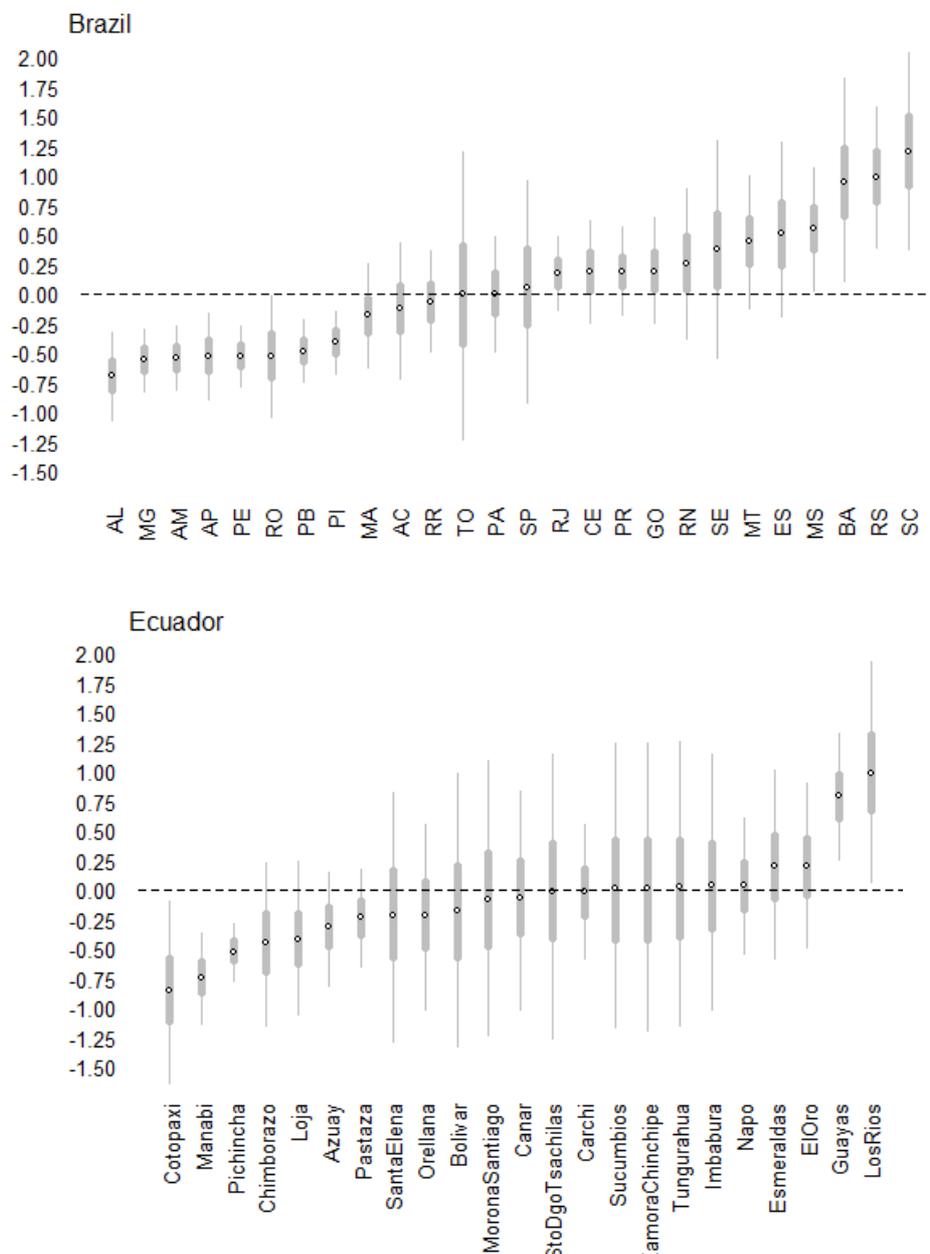
	Model 1		Model 2		Model 3	
	Param	Cred.Int	Param	Cred.Int	Param	Cred.Int
Intercept	-3.90	(-4.42 , - 3.36)	-3.99	(-5.29 , - 2.73)	-4.09	(-4.76 , -3.39)
EBI	0.58	(0.34 , 0.82)			0.56	(0.33 , 0.8)
sptGINI			1.59	(0.9 , 2.27)	1.09	(0.48 , 1.72)
PtyPct	11.71	(11.25 , 12.18)	12.09	(11.67 , 12.5)	11.25	(10.77 , 11.73)
ln(Ncandidate)	0.16	(0.1 , 0.23)	0.10	(-0.09 , 0.29)	0.11	(0.04 , 0.18)
PctClosedList	0.84	(0.36 , 1.36)	-1.04	(-2.44 , 0.44)	-0.23	(-0.78 , 0.33)
ln(Nmunicip)	0.46	(0.39 , 0.52)	0.44	(0.26 , 0.63)	0.47	(0.4 , 0.54)
$\text{cor}(Y, \hat{Y})^2$	0.47		0.46		0.50	
$\nu$	1.83	(1.77 , 1.89)	1.88	(1.82 , 1.93)	1.74	(1.72 , 1.79)
N.clusters:		77		77		77
N.obs		10340		10340		10340

Credible intervals in parenthesis, from 2.5% to 9.75%.

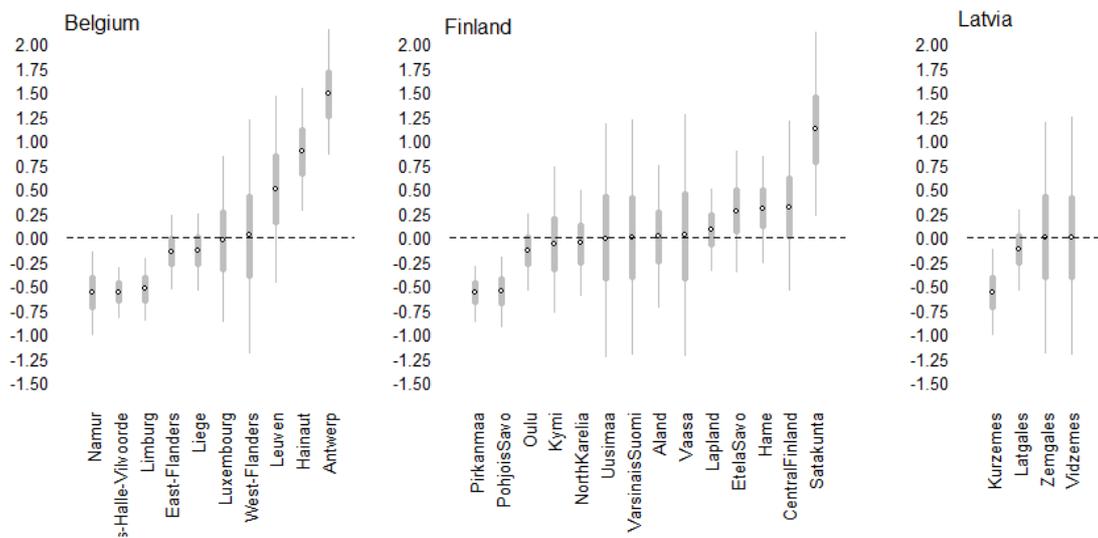
Notice that, across models, it does not make much difference if we include EBI and sptGINI alone or together, their general results are the same. Both have high probability of having a positive effect on the electoral performance of candidates. It means that, holding everything else constant, in our sample both concentrating votes geographically or spreading votes homogeneously throughout the territory are profitable strategies. Both seem to coexist as options at the disposal of candidates. Considering model 3, if one considers that EBI *usually* ranges up to 1 as sptGINI, it could even be (loosely) said that the impact of strong geographical homogeneity of electoral support is twice the impact of strong concentration of votes. Additionally, it is important to notice how strong is the impact of *PtyPct*, i.e. the share

of votes earned by the party of a given candidate. While there is certainly a degree of reciprocal causation here, the impact a given candidate's votes on his/her party's is never going to be so strong as the one showed above<sup>16</sup>. This is a preliminary indication that, despite the geographical distribution of votes a candidate has, overall the party electoral result is of utmost importance even in Open List systems, weakening once again the idea of pure personalization of politics.

**Figure 6 – Random effects of EBI on the electoral performance of candidates**



<sup>16</sup>Excluding *PtyPct* does not change qualitatively the other results.



Lastly, let's take a look at the random effects of EBI, yielded by the multi-level model number 3. Figure number 6 clearly shows that the positive fixed effect of EBI is not generalized across electoral circumscriptions. On the contrary, in the majority of the electoral circumscriptions in my sample, the random effect of EBI was either negative or evenly close to zero. Where it was negative, it means that concentrating electoral support geographically even decreased electoral performance. This another clear evidence that, although there is definitively room for localism in the PR Open List systems, it is not even close to be such a hegemonic and defining strategy as the literature has been assuming. Although I do not present similar graphics for other parameters for the sake of space, results are the same, i.e. different signs across electoral circumscriptions.

## 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 under these systems really tend to pursue the formation of electoral parishes in order to be able to further deliver pork barrel. Substantively, one first conclusion was that, in general, many or even most candidates do not have great values of EBI - i.e. they have geographical concentration of electoral support close to zero, which is the random pattern level. However, elected candidates generally concentrate more than non elected, a pattern that is only not clear in Brazil. Still, we found that most candidates are only following the demographic distribution of electors, what means that great part of those who concentrate votes, is only following the geographical concentration of voters. Regarding the strategic pay off, overall we can affirm that different strategies can be and have been profitably pursued in the studied personal voting systems. Both concentrating votes and spreading votes. And both proved to

profitable. It means that more than way to look for votes under PV, i.e. there is no automatic tendency towards the formation of electoral parishes where to deliver parochial goods. An additional finding is that the partisan performance is still of utmost importance for candidates' electoral support.

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 neglectableroom for localized strategies under PR-Open List systems, taking this route has been not the systematic choiceof candidates and does not appear to be 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<sub>e</sub>*), not to mention the proper final execution of localist outcomes (*Paroc<sub>l</sub>*).

## References

- ABRANCHES, Sérgio H. H. de. (1988), "Presidencialismo de Coalizão: O Dilema Institucional Brasileiro". In: Dados, v. 31, n. 1, pp. 5-38.
- ALLEN, Nathan. 2012. "Clientelism and the Personal Vote in Indonesia". Paper presented at the Western Political Science Association Annual Conference. Portland, March 23<sup>rd</sup>.
- AMES, Barry. 1995. "Electoral Strategy under Open-List Proportional Representation". In: American Journal of Political Science 39 (2): 406-33.
- AMES, B. (2001). The deadlock of democracy in Brazil. Ann Arbor, University of Michigan Press.
- AMORIM NETO, O. and SANTOS, Fabiano (2003). The Inefficient Secret Revisited: The Legislative Input and Output of Brazilian Deputies. Legislative Studies Quarterly, Iowa City, Iowa, EUA, v. 28, n. 3, p. 449-479.
- ANSELIN, L. (1995). Local indicators of spatial association – LISA. Geographical Analysis, 27, 93-115.
- ASSUNÇÃO, Renato and REIS, Edna (1999). A new proposal to adjust Moran's I For population density. Statistics in Medicine, 18.
- AVELINO, George; BIDERMAN, Ciro; SILVA, Glauco Peres da. (2011). A Concentração eleitoral nas eleições paulistas: medidas e aplicações. Dados, Rio de Janeiro, v. 54, n. 2
- BOCHSLER, D. (2010) "Measuring party nationalisation: a new Gini-based indicator that corrects for the number of units". Electoral Studies, v. 29, n. 1, p. 155-68, March.
- BOWLER, S. (2000), "Parties in Legislatures: Two Competing Explanations", in R. Dalton e M. Wattenberg (eds.), Parties without Partisans: Political Change in Advanced Industrial Democracies. Oxford, Oxford University Press, pp. 157-179.
- BOWLER, S. and Farrell, D.F. (1993). "Legislator Shirking and Voter Monitoring: Impacts of European Parliament Electoral Systems upon Legislator-Voter Relationships," Journal of Common Market Studies 31 (1): 45-69.

- CAIN, Bruce E., FERREJOHN, John e FIORINA, Morris. (1987), *The Personal Vote: Constituency Service and Electoral Service*. Cambridge, Harvard University Press.
- CARAMANI, D. (2004). *The nationalization of politics: the formation of national electorates and party systems in Western Europe*. Cambridge: Cambridge University Press.
- CAREY, John M e SHUGART, Matthew S. (1995), "Incentives to Cultivate a Personal Vote: A Rank Ordering of Electoral Formulas". *Electoral Studies*, vol. 14, no 4, pp. 417-439.
- CHANG, Eric C. C., and Miriam A. GOLDEN. 2006. "Electoral Systems, District Magnitude, and Corruption." *British Journal of Political Science* 37 (1): 115-137.
- CHEIBUB, J.A. e CAMARGOS, M. (2002). *Electoral strategies and electoral success in an Open-PR system*. Yale: Yale University. mimeo.
- CLIFF, A. D. and ORD, J. K. (1981). *Spatial Processes: Models and Applications*. London: Pion.
- COLOMER, J. (2009). *Personal Representation: The Neglected Dimension of Electoral Systems*.
- COX, G. (1987), *The Efficient Secret: The Cabinet and the Development of Political Parties in Victorian England*. Cambridge, Cambridge University Press.
- COX, G. (1999). Electoral rules and electoral coordination. *Annual Review of Political Science*, v. 2, p. 145-61.
- COX, G. e MCCUBBINS, M. (1993), *Legislative Leviathan: Party Government in the House*. Berkeley, University of California Press. Fiscal decentralization and particularistic spending across countries.
- CRISP, B. F., and R. E. INGALL (2002). "Institutional Engineering and the Nature of Representation: Mapping the Effects of Electoral Reform in Columbia." *American Journal of Political Science* 46(4): 733-48.
- DENEMARK, D. (2000). "Partisan Pork Barrel in Parliamentary Systems: Australian Constituency-Level Grants." *Journal of Politics* 62(3): 896-915.
- DIAZ-CAYEROS, Alberto. Kenneth M. MCELWAIN, Vidal ROMERO, Konrad A. SIEWIERSKI. (2009). *Fiscal decentralization and particularistic spending across countries*, Manuscript.
- FENNO, R. *Home style: house members and their districts*. Boston: Little Brown.
- FIGUEIREDO, A.C. e LIMONGI, F. (1998). "Bases Institucionais do Presidencialismo de Coalizão". *Lua Nova*, v. 44, n. 81-106.
- FIGUEIREDO, A.C. e LIMONGI, F. (1999). *Executivo e legislativo na nova ordem constitucional*. Rio de Janeiro, São Paulo, Editora FGV.
- FIGUEIREDO, A.C. e LIMONGI, F. (2002). "Incentivos eleitorais, partidos e política orçamentária". *Dados - Revista de Ciências Sociais*, v. 45, n. 2, pp. 303-44.
- FIGUEIREDO, A.C. e LIMONGI, F. (2005). "Processo Orçamentário e Comportamento Legislativo: Emendas Individuais, Apoio ao Executivo e Programas de Governo". *Dados - Revista de Ciências Sociais*, v. 48, n. 4, pp. 737-76.
- GERRING J. (2007), "Techniques for choosing cases", in John Gerring, *Case Study Research*, pp.86-150.
- FIORINA, Morris, P. (1997). *Congress: the keystone of Washington establishment*. New Haven, Yale University Press.
- GETIS A, ORD J K (1992). The analysis of spatial association by use of distance statistics. *Geographical Analysis* 24: 189-206
- GOLDEN, Miriam and Lucio PICCI (2008). "Pork-Barrel Politics in Postwar Italy, 1953-94". In: *American Journal of Political Science*, Vol. 52, No. 2, April, Pp. 268-289.

- HICKEN, Allen, and Joel W. SIMMONS, 2008, "The Personal Vote and the Efficacy of Education Spending", *American Journal of Political Science*, Vol. 52, No. 1, pp. 109–124.
- HONAKER, James and Drew LINZER (2006). *Analysis of Voteshares Across Party System*. Paper presented at the annual meeting of the American Political Science Association, Marriott, Loews Philadelphia, and the Pennsylvania Convention Center, Philadelphia, PA, Aug 31.
- KARVONEN, L. (2004). *Preferential Voting: Incidence and Effects*, *International Political Science Review / Revue internationale de science politique*, Vol.25, No. 2 (Apr., 2004), pp. 203-226
- KARVONEN, L. (2010). *The Personalisation of Politics. A Study of Parliamentary Democracies*. Colchester 2010: ECPR Press, 124 pp.
- KATZ, R.S. (1986). "Intraparty Preference Voting," in B. Grofman and A. Lijphart (eds), *Electoral Laws and their Consequences*. New York: Agathon Press.
- KATZ, Jonathan, and Gary KING. (1999). "A Statistical Model for Multiparty Electoral Data". *American Political Science Review*, 93, 15 – 32.
- KREHBIEL, Keith. (1992). *Information and Legislative Organization*, Ann Arbor, Michigan University press.
- KUNICOVÁ, Jana and Susan ROSE-ACKERMAN, 2005, "Electoral Rules and Constitutional Structures as Constraints on Corruption", *British Journal of Political Science*, Vol. 35, No. 4, 573-606.
- LAAKSO, M. e TAAGEPERA, R. (1979). *Effective number of parties: a measure with application to West Europe*. *Comparative Political Studies*, v. 12, n. 1, p. 3-27, April.
- LANCASTER, Thomas D. (1986). "Electoral Structures and Pork Barrel Politics". In: *International Political Science Review / Revue internationale de science politique* , Vol. 7, No. 1, *Public Policy and Government Structures*, pp. 67-81.
- LEE ,Jay and David W. S. WONG (2000). *Statistical analysis with ArcView GIS*. John Wiley & Sons, INC.
- LEE, S. (2009) *Bias from Misspecified Spatial Weight Matrices in SAR Models: Theory and Simulation Studies*.
- LINZER, Drew (2012). *The Relationship between Seats and Votes in Multiparty Systems*. *Political Analysis*, N.20.
- MAHONEY, J. et ali. (2009), *The Logic of Historical Explanation in the Social Sciences*", *Comparative Political Studies*, vol. 42, n. 1, pp. 114-146
- MAINWARING, S. (1991). "Politicians, parties and electoral systems: Brazil in comparative perspective". *Comparative Politics*, v. 24, n. 1, pp. 21-43.
- MAINWARING, Scott P. (1999). *Rethinking Party Systems in the Third Wave of Democratization. The Case of Brazil*. Stanford, Stanford University Press.
- MAYHEW, David R. (1974). *Congress. The Electoral Connection*. New Haven/London, Yale University Press.
- MESQUITA, L. (2009). *Emendas ao Orçamento e Conexão Eleitoral na Câmara dos Deputados Brasileira*. (Mestrado) - Departamento de Ciência Política, Universidade de São Paulo, São Paulo.
- MILESI-FERETTI, G-M, R. PEROTTI, and M. ROSTAGNO (2001). *Electoral Systems and Public Spending*. In IMF Working Paper WP/01/22. New York
- NORRIS, P. *Ballot Structures & Legislative Behavior*. Paper for the conference "Exporting Congress? The Influence of the U.S. Congress on World Legislatures" Jack D. Gordon Institute for Public Policy and Citizenship Studies, Florida International University, University Park Campus, Miami, Florida December 6-7, 2002

- PEREIRA, C. e MUELLER, B. (2002). "Comportamento Estratégico em Presidencialismo de Coalizão: As Relações entre Executivo e Legislativo na Elaboração do Orçamento Brasileiro". *Dados - Revista de Ciências Sociais*, v. 45, n. 2, pp. 265-301.
- PERSSON, Torsten, Guido TABELLINI, and Francesco TREBBI. 2003, "Electoral Rules and Corruption", *Journal of the European Economic Association*, Vol. 1, No. 4: pp. 958-989
- PEREIRA, C. e MUELLER, B. (2003). "Partidos Fracos na Arena Eleitoral e Partidos Fortes na Arena Legislativa: A Conexão Eleitoral no Brasil". *Dados - Revista de Ciências Sociais*, v. 46, n. 4, pp. 735-71.
- RAGIN, C. C. *The comparative method: moving beyond qualitative and quantitative strategies*. Berkeley: University of California Press, 1989.
- RICCI, Paolo. (2003). "O conteúdo da produção legislativa brasileira: leis nacionais ou políticas paroquiais?". *Dados (Rio de Janeiro)*, Rio de Janeiro, v. 46, n. 4, p. 699-734.
- SAMUELS, David. (2001). "Political Ambition and Pork-Barrel Politics in Brazil." In *Legislative Politics in Latin America*, ed. Scott Morgenstern and Benito Nacif. New York: Cambridge University Press.
- SHUGART, M., Melody Ellis VALDINI, and Kati SUOMINEN. 2005. "Looking for Locals: Voter Information Demands and Personal Vote-Earning Attributes of Legislators under Proportional Representation." *American Journal of Political Science* 49 (2): 437–449.
- SCHMITTER P. (2009), "The nature and future of comparative politics", *European Political Science Review*, 1.
- SEDDON, Jessica; Alejandro Gaviria; Ugo Panizza; Ernesto Stein (2001). *Political Particularism Around the World*
- TAAGEPERA, R. (1994). "Beating the Law of Minority Attrition," in W. Rule and J.F. Zimmermann (eds), *Electoral Systems in Comparative Perspective: Their Impact on Women and Minorities*. Westport, CT: Greenwood Press.
- TAVITS, Margit, 2010, "Effect of Local Ties on Electoral Success and Parliamentary Behaviour: The Case of Estonia", *Party Politics*, 16: 215
- TAYLOR, P. J. and JOHNSTON, R. J. (1979). *Geography of elections*. Harmondsworth, England; New York: Penguin.
- TILLY, C. (1984), *Big Structures, Large Processes, Huge Comparisons*, New York: Russell Sage Foundation.
- VAN METER, E; AB LAWSON, N COLABIANCHI, M NICHOLS, J HIBBERT, D Porter, AD LIESE. (2011). Spatial accessibility and availability measures and statistical properties in the food environment. *Spatial and spatio-temporal epidemiology*, V.2, N.1.
- VASSELAI, Fabricio and MIGNOZZETTI, Umberto. (2011). "Diminuindo dúvidas sobre o efeito das emendas individuais ao orçamento na disciplina parlamentar: novos dados e novos testes". Manuscript.