THE ELECTORAL CONNECTION IN AN OPEN-LIST PR SYSTEM
Informal constituencies, budget amendments and public policies in Rio de Janeiro

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Introduction

In one sentence, the electoral connection is the mechanism linking politicians and their constituents (Mayhew, 1974). Researchers adopting an institutionalist perspective based on the rational choice theory invariably associate the strength of the electoral connection with the incentives for legislators to cultivate a personal vote (Mayhew, 1974; Nicolau, 2001; Pereira and Mueller, 2003; Norris, 2004; Gallagher, 2005).

No one questions the powerful influence of the electoral connection in open-list proportional representation (OLPR) systems. Surprisingly, though, it remains yet to be systematically tested. Thus so far neither comparativists (Norris, 2004; Shugart, 2005) nor area specialists specifically interested in

Brazilian politics have given this issue the attention it deserves (Nicolau, 2001; 2007). Despite espousing completely different perspectives, scholars in both fields fail to consider the same fundamental point: the electoral connection assumes multiple configurations in OLPR systems.[1]

For comparativists, the intrinsic territorial overlapping of multi-member constituencies strongly discourages the emergence of geographic-based representation. Instead, candidates seek electoral support in non geographic social segments (Loewenberg and Kim, 1978; Jewell and Loewenberg, 1979; Lancaster, 1986; Carey and Shugart, 1995). Social segments, then, such as the workers of a certain category or the followers of a given religion, are what make up the constituencies of legislators. Therefore, the electoral connection involves pursuing issue-based policies rather than pleasing specific geographic areas.

In contrast, for scholars working on Brazil, candidates confine their search for votes within

clear, yet informal, geographic boundaries. Therefore, it is a few geographic areas that make up a legislator's actual constituency rather than the scattered members of a particular social segment. The distributive literature on the U.S. House of Representatives is by far the main reference from which they build up their studies (Mainwaring, 1991; Lemos, 2001; Samuels, 2002; AmorimNeto and Santos, 2002; Pereira and Mueller, 2003; Pereira and Mueller, 2004; Pereira and Rennó, 2007). Hence, it is by no means unexpected to see them applying the concept of geographic-based representation – the core of the distributive perspective on the American first-pass-the-post system – to understand the behaviour of legislators in Brazil (Samuels, 2002; Pereira and Mueller, 2004; Pereira and Rennó 2007;Avelino and Biderman, 2009).

The fragility of the assumptions of both experts on Brazil and comparativists resides in their exclusivist nature. A simple inspection of the territorial distribution of votes in Brazilian legislative elections reveals that OLPR system's allow for the emergence of both geographic and non geographic-based representation. Research shows that candidates may opt to geographically restrict their campaigns, concentrating their votes in a few specific areas or to invest on a certain social segment widely dispersing their votes (Fleischer, 1976; Dias, 1991; Kuschnir, 2000a; Kinzo et al., 2003; Carvalho, 2003; Ames, 2005). Therefore, the formal single multi-member constituency would turn into many informal constituencies as candidates and sitting members draw within it different geographic, thematic and ideological borders. The electoral connection would then assume multiple configurations according to different territorial distributions of votes.

In this paper I set myself the goal of teasing out the effects of the electoral connection on Brazilian legislators' behaviour. In order to do so, I look at the Rio de Janeiro City Council (RJCC) over a fourteen-year period, which covers four legislative sessions between 1997 and 2010. I focus on the targeting choices of councillors when they have the chance to decide which policies they want to see implemented. Instead of adopting one of the two views seen in the previous paragraphs, I expect to see the targeting choices of councillors varying on the different characteristics of their informal constituencies.

More precisely, I examine councillors´ amendments to the Annual Budget Proposal (ABP). The ABP offers a unique chance for legislators to fund the policies they want to see implemented. I expect to see councillors channelling funds to either narrow or broad targets, depending on the characteristics of their informal constituencies.

Rather than narrowly aiming to help filling in a gap in the studies on Brazilian politics, this paper addresses a broader lacuna in the literature on OLPR systems. This is an endeavour of special concern to other Latin American countries such as Colombia and Peru, which also have post-authoritarian regimes built on OLPR systems.

In addition, I consider this paper to be an important step forward in our knowledge of the workings of local politics in Brazil. Despite the significant role of the subnational levels of government, the national Chamber of Deputies catches a far disproportionate amount of attention from scholars, causing state and municipal legislatures to be largely neglected. Again, this contribution might also benefit the study of local politics elsewhere since other countries also hold local and state elections under OLPR systems, such as those held in the Colombian cities of Bogotá, Cali and Medellín (García Sánchez, 2003) and in several German federal states (Pitrová, 2008).

Apart from these first introductory words, this paper is divided into five sections. In the next section I provide a discussion of the main references in the study of the electoral connection in Brazil. In the third section I present my variables and the hypotheses I am testing. I dedicate the forth section to set out the methods. Finally, in the fifth and sixth sections, respectively, I carry out my empirical analysis, followed by my conclusions.

The electoral connection in Brazil

Despite not carefully examined, the alleged effects of the electoral connection are, yet, frequently an essential component of explanatory models. As

a rule, it is assumed that the behaviour of Brazilian legislators gravitates fundamentally around local, geographically fragmented interests (Samuels, 2002; Pereira and Mueller, 2004; Pereira and Rennó, 2007; Avelino and Biderman, 2009). Moreover the explanatory models often do not include any variable capable of measuring the characteristics of legislators' constituencies. The need to meet the constituents' narrow geographic-based interests is usually taken for granted as the only conceivable goal and deemed as uniform for all legislators (Mainwaring, 1991; Lemos, 2001; AmorimNeto and Santos, 2002; Pereira and Mueller, 2003).

To date Ames (2005), in particular, Carvalho (2003) and Amorim Neto and Santos (2003) are the only political scientists to insofar consider and test the versatile character of the electoral connection in Brazil.[2]

Ames (2005) is the first to use the different patterns of vote distribution as an explanatory variable of legislators' behaviour.[3] He works with three defining elements of the informal constituencies: (1) vote distribution, the extent of scatteredness/ concentration of votes; (2) their living standards; and (3) the degree of competition within them, which is named as dominance.[4] However innovative when shedding light on the existence of informal constituencies, Ames circumscribes his analysis to the usual limited approach adopted by experts interested in Brazil, leaving aside *a priori* the possibility that legislators may engage in broad scope initiatives. In other words, the informal constituencies are defined and measured but its influence on the behaviour of legislators is left unexplored.[5]

Amorim Neto and Santos (2003) go a step further (Lemos, 2001; Amorim Neto and Santos, 2002; Ames, 2005). Working with vote distribution and dominance, taken from Ames (2005), they distance themselves from the previous studies by admitting the possibility that legislators might lean towards broad policies issues, depending on the characteristics of their informal constituencies.

Accordingly, more dominant legislators and legislators who concentrate more votes in a few municipalities would be closer to their constituents and, therefore, more able to claim credit for the delivery of local, particularised benefits. Conversely, less dominant legislators and legislators whose votes are fairly dispersed throughout their formal constituency would be closer to non geographic segments and, therefore, more able to claim credit for the enactment of broad public policies.

Two set of logit multiple regressions are used. One set of regressions measures the chance of a legislator to submit at least one national proposal, whereas the other measures the chance of a legislator to submit at least one parochial proposal, which targets a single municipality.

The findings partially corroborate the expected effects of the electoral connection. The model for the national proposals, though, yields some puzzling, unexplained, results, as it shows increasing geographic vote concentration leading to increasing chances of submitting a proposal, which contradicts the expectations.

The inclusion of vote distribution and dominance clearly enhances the analysis. Nevertheless, when building their parochial proposals model, Amorim Neto and Santos (2003) do not worry to check the matches between the target of the proposals and the legislator's top municipalities in terms of vote distribution and dominance. In other words, we do not know if the legislators are targeting the municipalities in which they perform better or if they are, instead, targeting any municipality regardless of their degree of dominance or vote concentration. To precisely measure the effect of the electoral connection, though, we should not take into account all the parochial proposals but only those targeting the municipalities considered as making up the legislator's informal constituency.

Carvalho (2003) later confirms the significant role of dominance on the submission of national proposals, tested alongside the effect of government coalition membership and ideology. More importantly though, when looking at the local initiatives, Carvalho (2003) does check the matches between their targets and the legislator's top municipalities regarding the degree of vote concentration. The indicator, in fact, informs the percentage of the budget amendments targeting the top fifteen municipalities.[6]

The effect of dominance on the indicator score of each individual legislator is tested and confirmed, using an ordinary least square regression model. As

expected, increasing degree of dominance leads to increasing shares of the budget amendments targeting the top municipalities.

However, Carvalho (2003) does not include vote distribution, living standards or ideology in his explanatory model. These three elements would certainly widen and enhance the analysis. Furthermore, his decision to base his indicator on the percentage of the number of budget amendments might be misleading. For instance, two different amendments, equally counted as one, may have disparate values, as one may fund the construction of a big barrage and the other, the paving of a small rural road. For this reason, it would be better to build the indicator using the value, not the number, of the amendments, which is how I proceed as shown in the next section.

Variables & hypotheses

The executive is responsible for drafting the Annual Budget Proposal (ABP) and sending it to the legislature. Once in the legislature, the ABP, which estimates the revenue and sets the expenditures for the following fiscal year, may be changed before submitted to a final vote. In contrast with the members of the National Congress, there are no quotas for individual councillors in Rio de Janeiro regarding the amount of funds they are allowed to reallocate. The funds are channelled to either local or non-territorial targets. These two targets are, each, the basis for my two dependent variables. *Local funds* measures for each councillor the amount of funds in reais that is reallocated to her top neighbourhoods whereas *non-territorial funds* measures for each councillor the amount of funds in reais that is reallocated to non-territorial targets.[7]

Because a great number of councillors choose not to amend the ABP, my dependent variables present highly right skewed distributions. Given its statistical features, my data demands the use of a zero-inflated negative binomial (Zinb) regression model. Zinb models are two-part models. On the one hand, a binary component estimates the probability of a zero count, which here means the chance that a legislator will not reallocate any budget fund

at all. On the other hand, a negative binomial component estimates the positive counts, which means the change in the amount of budget fund that a legislator reallocates, excluding those who have not submitted any amendment. The negative binomial component constitutes the core of my analysis.

Count model

Building on the work of Ames (2005), I test the effect of (1) *vote distribution*, (2) *dominance* and (3) *living standards* on the behaviour of councillors when submitting amendments to the ABP.

Vote distribution

Formally all fifty-one councillors in Rio de Janeiro represent the same single at-large citywide constituency. However, the existence of different territorial distributions of votes suggests otherwise. In the 2000 election, for instance, councillor Luis Carlos Aguiar got almost half of his sixteen thousand votes from the two suburban neighbourhoods of Cordovil and Parada de Lucas alone, which comprises an area of six square kilometres (km²) or 0.5% of the municipal territory. On the other hand, in that same year, councillor Carlos Bolsonaro exhibited a completely different pattern of vote distribution. His 16,053 votes are much more dispersed, with a maximum of 1,002 or 6.2% garnered in Copacabana.

Each of these two patterns of *vote distribution* should create a different set of incentives leading, therefore, to different behaviours. On the one hand, there is a well defined geographic circumscription in the north of the city; on the other, there is a thematic/ideological non geographic space. As expected, councillor Bolsonaro is indeed known for defending far-right political views and for standing as the representative of the military while councillor Aguiar likes to picture himself as the local benefactor of his small bailiwick. The first fits the model proposed by comparativists while the second proves that the transplantation of the distributive archetype from first-pass-the-post systems to Brazil does, if not always, also make sense.

Accordingly councillors whose votes are reasonably scattered should reallocate greater amount of budget funds to non-territorial targets. Given

Figure 1
Councillor Luis Carlos Aguiar – Vote Distribution, 2000 Election
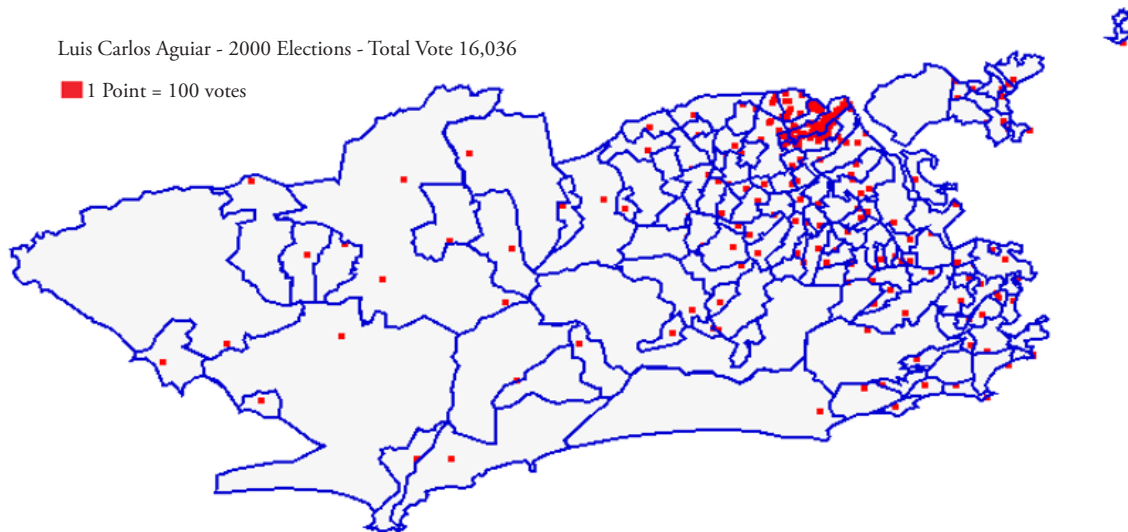
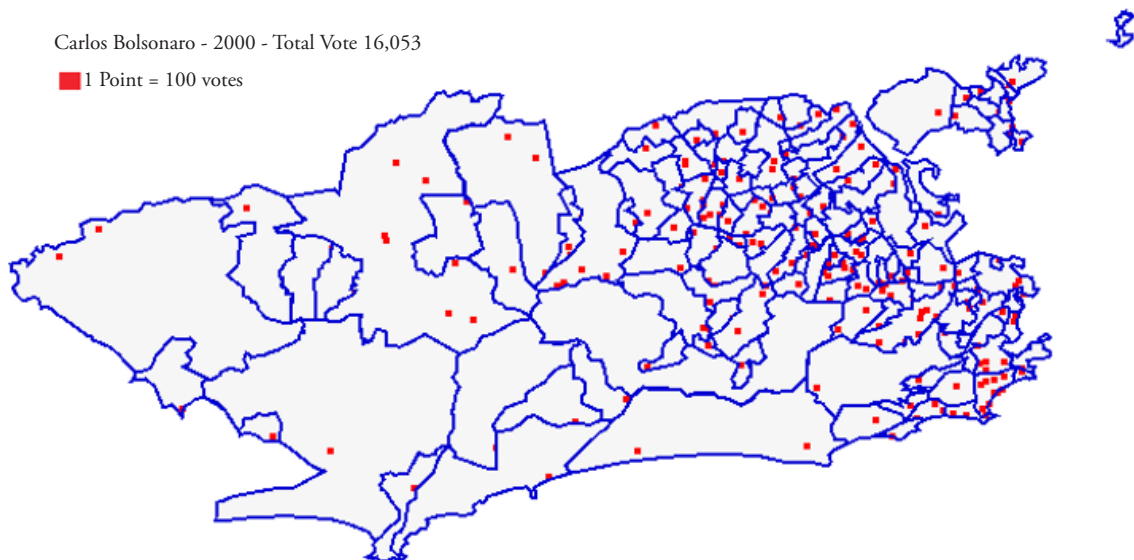Luis Carlos Aguiar - 2000 Elections - Total Vote 16,036

■ 1 Point = 100 votes

Author's elaboration
Elaborated using data collected from the RJCC website, the Brazilian Electoral Court website and the Instituto Pereira
Passos website, available at www.camara.rj.gov.br, www.tse.jus.br and
armazemdedados.rio.rj.gov.br.
Made with Philcarto 5.64.

Figure 2
Councillor Carlos Bolsonaro – Vote Distribution, 2000 Election

Carlos Bolsonaro - 2000 - Total Vote 16,053

■ 1 Point = 100 votes

Author's elaboration
Elaborated using data collected from the RJCC website, the Brazilian Electoral Court website and the Instituto Pereira
Passos website, available at www.camara.rj.gov.br, www.tse.jus.br and armazemdedados.rio.rj.gov.br.
Made with Philcarto 5.64.

their pattern of vote distribution, instead of a few specific neighbourhoods, they would see non geographic social segments as their constituencies. Conversely, councillors who concentrate large shares of their votes in a few neighbourhoods are more likely to target these same neighbourhoods with local benefits. Given their pattern of vote distribution they would see their top neighbourhoods as their constituencies, instead of non geographic social segments.

From what has been specified, I derive the following hypotheses:

H1 The more dispersed the votes of a councillor, the greater the amount of funds reallocated to non-territorial targets.

H2 The more votes a legislator concentrates in a few neighbourhoods, the greater the amount of funds reallocated to these same neighbourhoods.

Dominance

Aguiar, in fact, reigns comfortably in his suburban stronghold, as no other councillor is firmly established in that area. Thus, in this case, the analogy with the representatives of single-member constituencies of FPTP systems is far from inadequate. However, most of his peers are not as dominant as he is. The clash between councillors Aspásia Camargo and Andrea Gouvêa Vieira demonstrates this.

These two councillors received similar amounts of votes in the 2008 election, respectively 31,880 and 28,213. They, too, concentrated much of their votes – 42.1% and 43.1% – in the five neighbourhoods in which they performed better. The similarity between them includes their main sources of votes, as the map below shows the overlapping of their vote distribution.

The comparison between Aguiar, on the one hand, and Camargo and Vieira, on the other, takes us to the second defining element of the informal constituencies: the competition from fellow members of

Figure 3
Councillors Aspásia Camargo and Andrea Gouvêa Vieira – Vote Distribution and Territorial Overlap
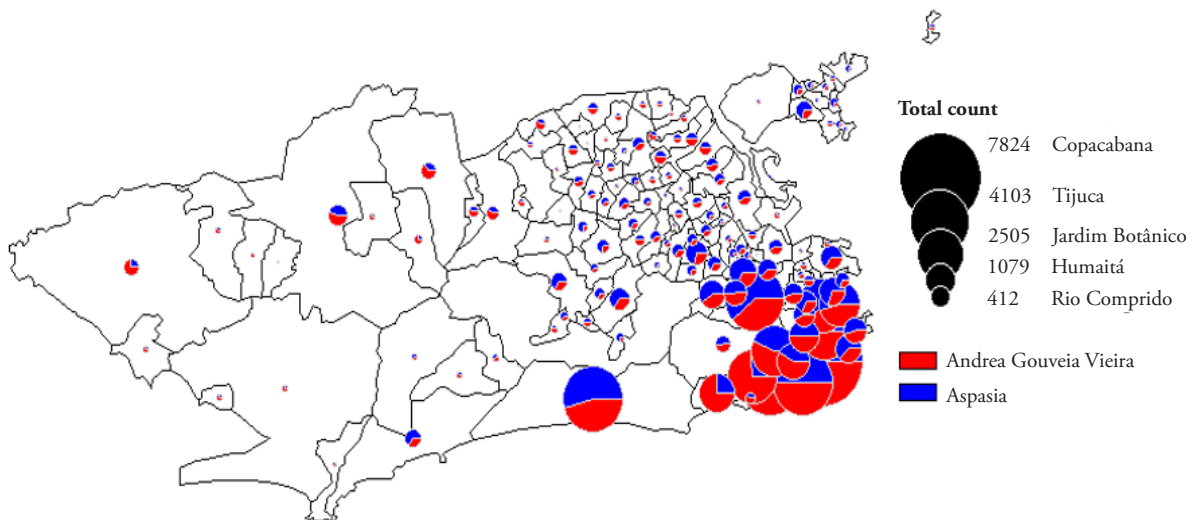
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Made with Philcarto 5.64.

the legislature in the areas in which legislators perform better, in other words, the degree of a councillor´s *dominance* over a territory. Distinct degrees of *dominance* should lead legislators to behave differently. For dominant councillors like Aguiar the status of local benefactor is reasonably safe from challengers. Conversely, the local leadership of councillors such as Camargo and Vieira is much more precarious.

Essentially, increasing degrees of *dominance* would bring councillors closer to the distributive mode of behaviour as their ability for claiming credit for the delivery of particularised benefits increases. In contrast, for councillors at the low end of the *dominance* scale, claiming credit for the delivery of local benefits would be anything but feasible. Because they lack the power to affirm any territorial leadership, they would more frequently engage in non geographic initiatives.

From what has been specified, I derive the following hypotheses:

H3 The less dominant a councillor, the greater the amount of funds reallocated to nonterritorial targets.

H4 The more dominant a councillor, the greater the amount of funds reallocated to her top neighbourhoods.

Living standards

The third main defining element of the informal constituencies is the *living standards* of the neighbourhoods which contribute the greatest to the legislator's votes. For example, considering the 2000 election, councillors Aguiar and Leila do Flamengo both concentrated large shares of votes in a few neighbourhoods. These neighbourhoods were also fairly safe from outsiders. Their living standards were starkly different though, as seen in the following map. Aguiar's top neighbourhoods scored 0.79 on the Human Development Index (HDI) whereas Leila do Flamengo's scored 0.95.

Figure 4
Councillors Leila do Flamengo and Luis Carlos Aguiar – Living Standards of Top Neighbourhoods
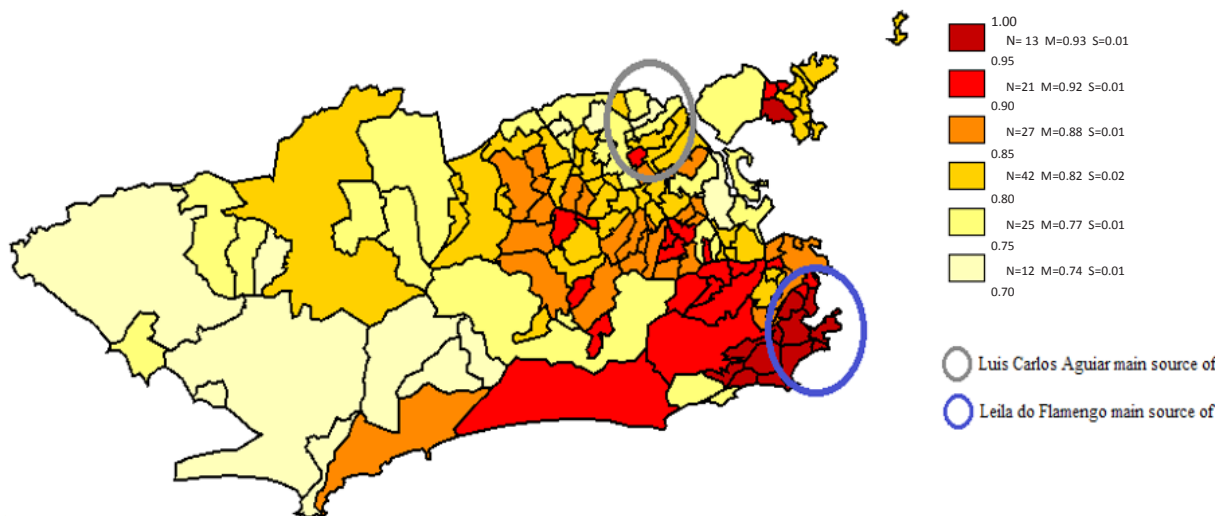
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Made with Philcarto 5.64.

It is plausible to expect that differences in the *living standards* of the top neighbourhoods influence the behaviour of legislators. Constituents in poorer neighbourhoods are, at one time, less well served by and more dependent on the provision of public services. Understandably, demands for the proper provision of basic public services are more frequent and dramatic in low HDI neighbourhoods.

Therefore, councillors whose top neighbourhoods have low *living standards* are subject to greater pressure regarding the solution of eminently local immediate needs, which would draw them near the logic of distributive policies (Diniz, 1982; Kuschnir, 2000a; 2000b). In contrast, the inhabitants of high income neighbourhoods usually do not need to knock on the doors of the RJCC to have the potholes on the local public ways taken care of. Thus, free from worrying with the proper delivery of basic public services, these constituents can more frequently centre their demands on broad-scope policies and issues.

From what has been specified, I derive the following hypotheses:

H5 The higher the living standards of the top neighbourhoods of a councillor, the greater the amount of funds reallocated to non-territorial targets.

H6 The lower the living standards of the top neighbourhoods of a councillor, the greater the amount of funds reallocated to these same neighbourhoods.

I am also testing for interactive effects between *vote distribution*, *dominance* and *living standards*. I have a series of two-way interactive terms and one three-way interactive term.

I expect *vote distribution*, *dominance* and *living standards* to influence on one another's effects. For instance, as set out in H2, the larger the shares of votes a councillor concentrates in her top neighbourhoods, the greater the amount of funds reallocated to these same neighbourhoods. As I contend, this relationship is further reinforced or attenuated *by living standards* and *dominance*. High dominance and low living standards would reinforce the effect

of high vote distribution scores on *local funds* while low dominance and high living standards would attenuate it. The same applies to the remaining possible different interaction terms both in terms of their effect on *local* and *non-territorial funds*. Thus, for instance, the heavier emphasis on *non-territorial funds* of fairly non dominant councillors is strengthened by high living standards and/or small sum of votes concentrated in the top neighbourhoods.

Other independent variables

Besides my three main independent variables, there are five additional independent variables – *provision of social services*, *seniority*, *number of votes*, *population size* and *party ideology*. Consonant with the literature on candidate-centric system, I expect *party ideology* to play no significant role.

The other four independent variables should not affect councillors' behaviour – whether leaning more towards broad or narrow targeting choices. I expect to see them affecting the amount of budget funds being reallocated but not their targeting choice.

Specifically, in regard to *seniority*, along with the years served in the legislature comes an increasing familiarity with the legislative process, which should benefit more senior councillors when seizing the opportunity to amend the ABP. Thus, increasing seniority should lead to increasing amount of budget funds being reallocated. Similarly, *population size*, which measures for each councillor the size of the population living in the top neighbourhoods, should have a positive relationship with the amount of reallocated budget funds. Thus, the greater the *population size*, the greater the pressure for the funding of public policies and, therefore, the greater the amount of reallocated budget funds. Conversely, as far as *number of votes* is concerned, more vulnerable councillors should work harder to retain and expand their constituencies, which should lead to increasing amount of budget funds being reallocated. Then, the smaller the number of votes received in the past election, the greater the amount of reallocated budget funds.

By its turn, the *provision of social services* should lead to decreasing amount of reallocated budget

funds. The running of social centres has been portrayed in the media as a powerful political strategy. Through NGOs, councillors provide health and child care, education and job training to constituents, among other benefits. The use of such expedient is far from uncommon (Souza, 2004; Garcez *et. al.*, 2009). For many councillors the provision of social services is fundamental for their electoral survival. Keeping the social service machines well greased and running smoothly demands a good deal of resources (Siqueira, 2009). As a result, because of the effort put on polishing their main arms, councillors who run social centres sideline legislative initiatives, such as amending the ABP.

Binary model

I include eight variables in the binary component of my model. These are all dummy variables. Five of them indicate the different regions of the city: (1) *South Zone Centro & North Zone*; (2) *Suburbs*; (3) *Ilha do Governador*; (4) *Barra & Jacarepaguá*; and (5) *West Zone*. Each of these five regions provides their inhabitants with a sense of a shared identity. These different identities are found in councillors' speeches delivered on the RJCC floor and in the strategies and languages employed in political and electoral campaigns (Kuschnir, 2000a; 2000b). Several councillors are notoriously – and self-proclaimed – strongly associated with certain regions. The city administration, too, uses them to divide the municipal territory into different planning areas.

Two other variables refer to freshness: *freshers* and *freshers with relatives*. In this case the reference group are non fresher councillors. Finally, there is a dummy variable for the *membership of the Committee of Finances, Budget and Fiscal Oversight* (CFBFO). Notwithstanding its lesser importance in the analysis, the binary component addresses the interesting question of what determines the chance of a legislator to submit at least one budget amendment.

In sum, as far as *region* is concerned, I expect to see a distinct behaviour among councillors whose votes are found mainly in *South Zone, Centro & North Zone*. This is the region from which Kuschnir's (2000a) ideological councillors come. Accordingly, ideological councillors champion "universalist" ap-

proaches underpinned by modern notions of citizenship, regarding their terms in office as "instruments" for the "organised" and "politically aware" sectors of society. In comparison with their fellow legislators, these councillors should be more likely to reallocate at least some *non-territorial funds* and more likely not to reallocate any *local funds*.

In regard to freshness, *freshers* should be more likely not to reallocate any funds while no significant difference should be seen between *freshers with relatives* and *non freshers*. Lastly, councillors with no experience in the CFBFO should be more likely not to submit any budget amendments.

Methods

My analysis covers four legislative sessions – 1997-2000, 2001-2004, 2005-2008 and the first two years of the 2009-2012. In the legislative sessions of 1997-2000 and 2001-2004, there were forty-two seats in the RJCC. This number went up to fifty in the following legislative session of 2005-2008 and finally to fifty-one in the legislative session of 2009-2012. However, the total number of councillors serving in each legislative session has been greater than the number of seats in the council as substitutes are sworn in to replace main office holders who take a leave of absence or do not finish their terms. Hence, the total number of councillors serving in each of the four legislative sessions is respectively 53, 52, 66 and 56.

My unit of analysis is all the councillors who have served in the RJCC for at least one year during the budgetary process. In order to increase the number of observations, I am pooling all councillors from the four legislative sessions into a single time-series cross-section (TSCS) dataset. My unit of observation is councillors per year. Thus, individual councillors appear in the dataset as many times as the number of years they have served between January 1997 and December 2010. For instance, then, a councillor who served six years appears six times in the dataset.

I run several different models: a basic model, without any interaction terms, and some additional ones, testing the interactive effects among *vote dis-*

tribution, *dominance* and *living standards* (Aiken and West, 1996; Jaccard and Tuttisi, 2003; Greene, 2010; Hilbe, 2011). I am working with two dependent variables, as I explain in the next section. Therefore, I run two sets of regressions.

Given the non normal distribution of my two dependent variables I cannot use an ordinary least squares (OLS) regression model to run my analysis. At first, a Poisson model, instead, seems as the appropriate solution. However, the mean and variance values of neither of my dependent variables are the same. The overdispersion seen in both cases, as variance exceeds the mean, constitutes a violation of the Poisson distribution. Thus, considering the presence of overdispersion, the distribution that best fits the data is the negative binominal. Moreover, because of the excessive number of zeros, I resort to a Zinb model (Lambert, 1992).

Likewise to Poisson models, negative binominal models are used for the analysis of non-negative count data. The zero-inflated version is a two-part model: there are a binary component – either logit or probit –, that estimates the probability of a zero count, and a negative binomial component that estimates the positive counts. Typically, and this is the approach I follow, the count and the binary portions have different covariates. The covariates in the binary component are the covariates thought as having a direct bearing on zero counts (Hilbe, 2011).

The use of a negative binominal model requires some adjustments. Firstly I divide the values of my dependent variables by one thousand. This transformation diminishes the risk of numerical overflow during the calculation of the coefficients, as some of the observations counted millions of reais in reallocated funds (Greene, 2012). Secondly, I round off the values, turning them into integers.

Also, carrying out a regression analysis using TSCS data demands additional care, as it often allows for temporally and spatially correlated errors and heteroscedasticity (Beck and Katz, 1995). In regard to my data in particular, it might be argued that the way councillors behave in a certain year is dependent on the way they behaved in the past. Also, there might be a particular circumstance in a given year that affects all councillors' behaviour. Tackling these issues demands the addition of the lagged dependent variable – y_i, t-1 – in the set of the regressors – xi, t –, the inclusion of dummy variables for each year and the use of robust standard errors.

In total, I would have 638 observations. The actual number of observation is smaller, though. The addition of the lagged dependent variable reduces the number of observations because newcomers have no previous year's record of budget funds reallocation. Therefore these observations have to be dropped. Moreover, the elimination of outliers further reduces the number of observations. Once such cases were treated I ended up with 461 observations in my *local funds* regressions and 466 in my *non-territorial funds* regressions.

Measuring the dependent variables

Local Funds and Non-territorial Funds

Local funds measures the amount of budget funds a legislator reallocates to her top neighbourhoods whereas *non-territorial funds* measures the amount of budget funds a legislator reallocates to non-territorial targets.

In most cases coding the assigned target of the funds is a straightforward task. A great majority of the funds are channelled either to specific neighbourhoods – *local funds* – or to the city or a social segment – *non-territorial funds*. There are exceptions, though, as budget amendments might also target an Administrative Region (AR) or Planning Area (PA).

The PAs are the broadest administrative level. The ARs come next. They make up an intermediary level between the PAs and the neighbourhoods. In total, there are 10 APs, 34 ARs and 140 neighbourhoods. Because the PAs cover large territories, I code the funds going to a PA as *non-territorial funds*. The ARs are not as wide, though. Therefore, I code as *local funds* the funds going to an AR in which at least one of the councillor's top 5 neighbourhoods is located.

Measuring the independent variables

Vote Distribution

Vote distribution is a continuous variable. It measures, for each councillor, the extent to which her votes are more or less evenly scattered throughout the

city. Constructing it involves two steps. In the first step, for every councillor in each neighbourhood, I calculate C_{ij}, the percentage that neighbourhood j contributes to councillor i's total vote citywide.

As I contend, given their electoral importance, councillors might convert some neighbourhoods into their informal constituency. It is reasonable to suppose that neighbourhoods with great shares of a councillor's total vote should comprise her informal constituency. Generally C_{ij} shows little dispersion. On average 122 of the 140 neighbourhoods contribute, each, with 1% or less of the councillors' total vote Neighbourhoods concentrating such small fractions of councillors' total vote can hardly be thought as relevant per se and hence may well be considered not part of an informal constituency. In contrast, on average councillors find 19.1% of their total vote in their top neighbourhood and slightly more than half of this amount, 9.8%, in their second top neighbourhood. Together the top five ranked neighbourhoods add to nearly 45% of the councillors' total vote.[8]

For the purpose of my analysis, the fifth top neighbourhood, which has a C_{ij} score of nearly 4% of the total vote, seems as a reasonable refer-

ence for drawing the line to calculate how concentrated the votes of a councillor are. Moreover, all councillors would increasingly tend, beyond this point, to equally value the neighbourhoods, as there is little and decreasing dispersion around the mean C_{ij} score.

So for each councillor, *vote distribution* is measured by calculating the share of her total vote that comes from her top 5 neighbourhoods.

Dominance

Dominance is a continuous variable. The way I operationalise it is slightly adapted from Ames (2005). *Dominance* measures the extent to which a councillor dominates her top 5 neighbourhoods. The five neighbourhoods used to calculate councillors' *vote distribution* are also the reference for assessing councillors' *dominance*.

I proceed in two steps. First, for every councillor in each of her top 5 neighbourhoods, I measure D_{ij}, councillor i's dominance score in neighbourhood j. In order to do so, I identify all councillors who have neighbourhood j ranked among their top 5 neighbourhoods. I then calculate D_{ij} as council-

Table 1
Independent Variables – Count Model[10]

IV Name	Coding	Expected Effect on DVs
Party Ideology	Ordinal: 1 for left; 2 for centre-left; 3 for centre-right; 4 for right.	No significant effect
Provision of Social Service	Dummy: councillor coded as 1 if provides social service and 0 if does not	0 to 01 in IV leads to decreasing DV
Seniority	Countinuous: the number of years served. For months not fully served, periods below 15 days are counted as a month served and period of 15 or more days are counted as a month served. For each councillor, it is calculated as the sum of months served in the RJCC divided by twelve.	Increasing IV leads to increasing DV
Population Size	Continuous: the weighted mean of the number of inhabitants in councillor´s top 5 neighbourhoods divided by 1,000.	Increasing IV leads to increasing DV
Number of Votes	Countinuous: votes received in the past election.	Decreasing IV leads to increasing DV

lor i's share of the total vote cast in neighbourhood j for all councillors who have neighbourhood j ranked among their top five neighbourhoods.

In the second step, I calculate the dominance score for each councillor across her top 5 neighbourhoods. I sum the five Dij scores, weighted by the share each neighbourhood contributes to councillor i's vote in her top 5 neighbourhoods. Hence, the higher a councillor's dominance score, the more she dominates her five best neighbourhoods, instead of sharing them with fellow legislators.

Living standards

Living standards is a continuous variable. I use the Human Development Index (HDI) as my measurement of *living standards*. The HDI, which varies from 0 to 1, is widely known as the United Nations Development Programme (UNDP) index for assessing human development around the world. The higher the score, the greater the human development.

I assess, for every councillor, the HDI of her top 5 neighbourhoods. As I proceed with dominance, here I sum the five HDI scores, weighted by the share each neighbourhood contributes to councillor i's total vote in her top 5 neighbourhoods.

In regard to the other independent variables, Table 1 explains their coding, measuring and expected effects on the dependent variables.[9]

Empirical analysis

The count models

Since zero-inflated negative binomial (Zinb) models are two-part models, I first approach the results of the count component. Next, I discuss the figures coming out of the binary component.

I have nine different models for each of my two dependent variables. The first, Model I, is the basic model, in which there are no interaction terms. The other models all include one or more interaction terms.

I present the results in Tables 2 and 3. As far as *non-territorial funds* is concerned, I show the results just for Models I, IV and IX, as the others have

yield significant, although small, impact only for the variable *vote* (Long, 1997).[11]

As hypothesised, the conformation of different informal constituencies is paramount to explaining how councillors choose to amend the Annual Budget Proposal. All in all the analysis confirms the impact of the electoral connection. More important, it confirms the multiple configurations of the electoral connection in OLPR systems. *Dominance*, *living standards* and *vote distribution* significantly affect the amending choices of legislators in Rio de Janeiro. The variation in these three indicators – taken on their own or as interaction terms – tells us where the different members of the RJCC place their emphasis when funding public policies.

Vote distribution, on its own, plays a critical role on both *local* and *non-territorial funds*. The fewer the votes a councillor concentrates in her top 5 neighbourhoods, the more she prioritises the funding of broad-scope public policies whereas the more votes a councillor concentrates in her top 5 neighbourhoods, the greater her emphasis on reallocating funds to particular geographic areas. Specifically, considering Model I, for every additional 1.0 point in the vote distribution score, the amount of funds a councillor reallocates to her top 5 neighbourhoods increases by 0.8%, holding all other variables constant. The effect on *non-territorial funds* is exactly the same but runs in the opposite direction: for every 1.0 point decrease in the vote distribution score, the amount of funds a councillor reallocates to non geographic targets increases by 0.8%.[12]

On the one hand, legislators whose votes are reasonably scattered across the city put their terms in office at the service of the non geographic representation of social segments. As such, they use their budget amendments to fund broad-scope public policies, attaching no special interest to their top 5 neighbourhoods. For comparativist scholars these councillors are the archetype of legislators in OLPR systems, in which the essential territorial overlapping of multi-member constituencies would strongly dampen the emergence of geographic-based representation (Loewenberg and Kim, 1978; Jewell and Loewenberg, 1979; Lancaster, 1986; Carey and Shugart, 1995).

On the other hand, councillors who concentrate large shares of votes in a specific area of the

Table 2
Zero-inflated Negative Binomial Models – Count Component – *Non-territorial Funds*

Dependent variable: *Non-Territorial Funds*

Observations & Model Fit	Model I	Model IV	Model IX
Observations	466	466	466
Non zero observations	308	308	308
Zero observations	158	158	158
Wald test (p-value)	0.000	0.000	0.000
/lnapha=0	0.166***	0.166***	0.130***

Variables	Model I	Model IV	Model IX	Variables	Model I	Model IV	Model IX
Vote distribution	-0.008*	-0.008*	-0.008*	Year 1998	-0.331	-0.331	-0.205
	(0.005)	(0.005)	(0.005)		(0.547)	(0.545)	(0.546)
Dominance	-0.436	-0.431	-0.878	Year 1999	-0.036	-0.036	0.060
	(0.677)	(-0.697)	(0.746)		(0.517)	(0.520)	(0.485)
Living standards	2.213	2.207	4.431**	Year 2000	0.304	0.303	0.265
	(1.731)	(1.830)	(2.017)		(0.548)	(0.548)	(0.530)
Party ideology	-0.016	-0.016	0.034	Year 2001	0.527	0.527	0.545
	(0.069)	(0.067)	(0.071)		(0.557)	(0.558)	(0.534)
Social service	-0.205	-0.205	-0.287	Year 2002	-0.531	-0.531	-0.601
	(0.214)	(0.214)	(0.207)		(0.491)	(0.490)	(0.452)
Seniory	0.022	0.022	0.028*	Year 2003	0.351	0.351	0.190
	(0.016)	(0.016)	(0.017)		(0.469)	(0.469)	(0.437)
Population size	-0.003	-0.003	-0.004	Year 2004	-0.392	-0.393	-0.460
	(0.003)	(0.003)	(0.003)		(0.483)	(0.484)	(0.456)
Votes	0.000*	0.000*	0.000**	Year 2005	-0.551	-0.552	-0.683
	(0.000)	(0.000)	(0.000)		(0.509)	(0.508)	(0.482)
Votdist x LivStandards			-0.059	Year 2006	-0.552	-0.552	-0.629
			(0.094)		(0.474)	(0.474)	(0.453)
Votdist x Dominance			0.029	Year 2007	0.620	0.620	0.500
			(0.021)		(0.497)	(0.496)	(0.468)
Dominance x LivStandards		-0.146	5049	Year 2008	-3.198***	-3.199***	-3.212***
		(6.247)	(7.866)		(0.480)	(0.480)	(0.457)
Votdist x Dominance*LivStand			-1.449***	Year 2009	-3.023***	-3.022***	-3.189***
			(0.415)		(0.551)	(0.552)	(0.525)
				Year 2010	-1.862***	-1.862***	-2.008***
					(0.534)	(0.535)	(0.512)
				Lag Non Territorial Funds	0.000***	0.000***	0.000***
					(0.000)	(0.000)	(0.000)
				Constant	6.780***	6.802***	4.994***
					(0.000)	(0.000)	(0.000)

Note: Robust standard errors in parentheses. *** significant at the 0.01 level. ** significant at the 0.05 level. * significant at the 0.1 level.

Author´s elaboration using data collected from the RJCC website, the Brazilian Electoral Court website and the Instituto Pereira Passos website, available at www.camara.rj.gov.br, www.tse.jus.br and armazemdedados.rio.rj.gov.br.

Table 3
**Zero-inflated Negative Binomial Models – Count Component – *Local Funds***

Dependent variable: *Local Funds*

Observations & Model Fit	Model I	Model II	Model III	Model IV	Model V	Model VI	Model VII	Model VIII	Model IX
Observations	461	466	466	461	466	466	461	466	466
Non zero observations	259	308	308	259	308	308	259	308	308
Zero observations	202	158	158	202	158	158	202	158	158
Wald test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
/lnapha=0	-0.348***	-0.351***	-0.361***	-0.385***	-0.368***	-0.389***	-0.399***	-0.401***	-0.405***

Variables	Model I	Model II	Model III	Model IV	Model V	Model VI	Model VII	Model VIII	Model IX
Vote distribution	0.008** (0.004)	0.009** (0.004)	0.009** (0.004)	0.006 (0.004)	0.011** (0.005)	0.004 (0.005)	0.007* (0.004)	0.006 (0.005)	0.007 (0.005)
Dominance	1.294*** (0.504)	1.152*** (0.539)	1.513*** (0.519)	0.984** (0.503)	1337** (0.545)	1093** (0.518)	1.201** (0.514)	1.273** (0.529)	1.223** (0.526)
Living standards	-3.178** (1.255)	-3.066** (1.229)	-2.587** (1.280)	-3237*** (1.206)	-2.362* (1.254)	-3.359*** (1.219)	-2.655** (1.226)	-2.781** (1.241)	-1.886 (1.485)
Party ideology	0.051 (0.054)	0.041 (0.056)	0.043 (0.053)	0.016 (0.054)	0.027 (0.054)	0.021 (0.055)	0.008 (0.053)	0.012 (0.054)	0.019 (0.054)
Social service	-0.357*** (0.138)	-0.286* (0.158)	-0.426*** (0.144)	-0.234 (0.144)	-0.337** (0.161)	-0.291* (0.154)	-0.299** (0.150)	-0.336** (0.157)	-0.360** (0.161)
Seniory	-0.040*** (0.012)	-0.046*** (0.012)	-0.039*** (0.012)	-0.055*** (0.012)	-0.047*** (0.012)	-0.052*** (0.012)	-0.055*** (0.012)	-0.052*** (0.012)	-0.052*** (0.012)
Population size	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	0.001 (0.002)	0.002 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)
Votes	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Votdist x LivStandards		0.081 (0.072)			0.110 (0.071)	-0.104 (0.096)		-0.078 (0.099)	-0.078 (0.097)
Votdist x Dominance			-0.037** (0.017)		-0.041** (0.017)		-0.036** (0.017)	-0.034** (0.017)	-0.034** (0.017)
Dominance x LivStandards				1.616*** (4.078)		1.997*** (5.670)	1.600*** (3.966)	1.901*** (5.807)	2.213*** (6.551)
Votdist x Dominance *LivStand									-0.382 (0.296)

Continues…

Note: Robust standard errors in parentheses. *** significant at the 0.01 level. ** significant at the 0.05 level. * significant at the 0.1 level.

Author´s elaboration using data collected from the RJCC website, the Brazilian Electoral Court website and the Instituto Pereira Passos website, available at www.camara.rj.gov.br, www.tse.jus.br and armazemdedados.rio.rj.gov.br.

Table 3
Zero-inflated Negative Binomial Models – Count Component – *Local Funds*

Dependent variable: *Local Funds*

Variables	Model I	Model II	Model III	Model IV	Model V	Model VI	Model VII	Model VIII	Model IX
Year 1998	0.877** (0.441)	0.980** (0.448)	0.664 (0.501)	1.141*** (0.432)	0.777 (0.508)	1.076** (0.421)	0.913* (0.494)	0.878* (0.484)	0.732* (0.442)
Year 1999	0.950*** (0.331)	1.057*** (0.326)	0.715** (0.317)	1.117*** (0.321)	0.831*** (0.313)	1.023*** (0.321)	0.884*** (0.310)	0.830*** (0.312)	0.676** (0.305)
Year 2000	0.101 (0.432)	0.217 (0.421)	-0.069 (0.436)	0.342 (0.397)	0.075 (0.426)	0.251 (0.389)	0.180 (0.398)	0.122 (0.394)	-0.066 (0.389)
Year 2001	0.365 (0.371)	0.562 (0.396)	-0.028 (0.395)	0.599* (0.352)	0.192 (0.408)	0.411 (0.381)	0.226 (0.374)	0.113 (0.397)	-0.061 (0.405)
Year 2002	0.980*** (0.228)	1.132*** (0.240)	0.761*** (0.235)	1.237*** (0.221)	0.940*** (0.246)	1.098*** (0.231)	1.020*** (0.223)	0.933*** (0.235)	0.738*** (0.246)
Year 2003	0.679*** (0.237)	0.850*** (0.257)	0.428* (0.238)	1.012*** (0.236)	0.634** (0.259)	0.873*** (0.248)	0.776*** (0.238)	0.689*** (0.250)	0.487* (0.267)
Year 2004	0.756*** (0.258)	0.929*** (0.263)	0.496* (0.260)	1.054*** (0.241)	0.704*** (0.264)	0.904*** (0.258)	0.805*** (0.239)	0.710*** (0.257)	0.532** (0.263)
Year 2005	1.054*** (0.311)	1.204*** (0.308)	0.774*** (0.300)	1.291*** (0.292)	0.947*** (0.297)	1.157*** (0.280)	1.022*** (0.282)	0.941*** (0.278)	0.704** (0.294)
Year 2006	0.790*** (0.254)	0.933*** (0.253)	0.530** (0.256)	1.124*** (0.250)	0.697*** (0.256)	1.021*** (0.242)	0.870*** (0.250)	0.809*** (0.246)	0.609** (0.252)
Year 2007	0.615** (0.258)	0.745** (0.257)	0.364 (0.260)	0.934*** (0.252)	0.513** (0.257)	0.841*** (0.248)	0.686*** (0.251)	0.633** (0.250)	0.430* (0.256)
Year 2008	-1.379*** (0.249)	-1238*** (0.254)	-1663*** (0.245)	-0.993*** (0.253)	-1.500*** (0.250)	-1.085*** (0.248)	-1.270*** (0.248)	-1.320*** (0.247)	-1522*** (0.258)
Year 2009	-0.644* (0.369)	-0.501 (0.374)	-0.976*** (0.377)	-0.299 (0.382)	-0.818** (0.381)	-0.400 (0.385)	-0.626 (0.385)	-0.680* (0.389)	-0.905** (0.381)
Year 2010	-0.644** (0.274)	-0.456* (0.264)	-0.985*** (0.279)	-0.303 (0.276)	-0.774*** (0.273)	-0.453* (0.255)	-0.636* (0.282)	-0.724*** (0.270)	-0.945*** (0.267)
Lag Non Territorial Funds	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Constant	8.717*** (1.270)	8.480*** (1.238)	8.529*** (1.287)	8.815*** (1.238)	8.185*** (1.252)	9.107*** (1.262)	8.619*** (1.240)	8.848*** (1.273)	8.234*** (1.413)

Note: Robust standard errors in parentheses. *** significant at the 0.01 level. ** significant at the 0.05 level. * significant at the 0.1 level.

Author´s elaboration using data collected from the RJCC website, the Brazilian Electoral Court website and the Instituto Pereira Passos website, available at www.camara.rj.gov.br, www.tse.jus.br and armazemdedados.rio.rj.gov.br.

Figure 5
The Interaction of Dominance and Vote Distribution

Partial Effect of *Dominance*Vote Distributionon Local funds* (R$ 1,000)
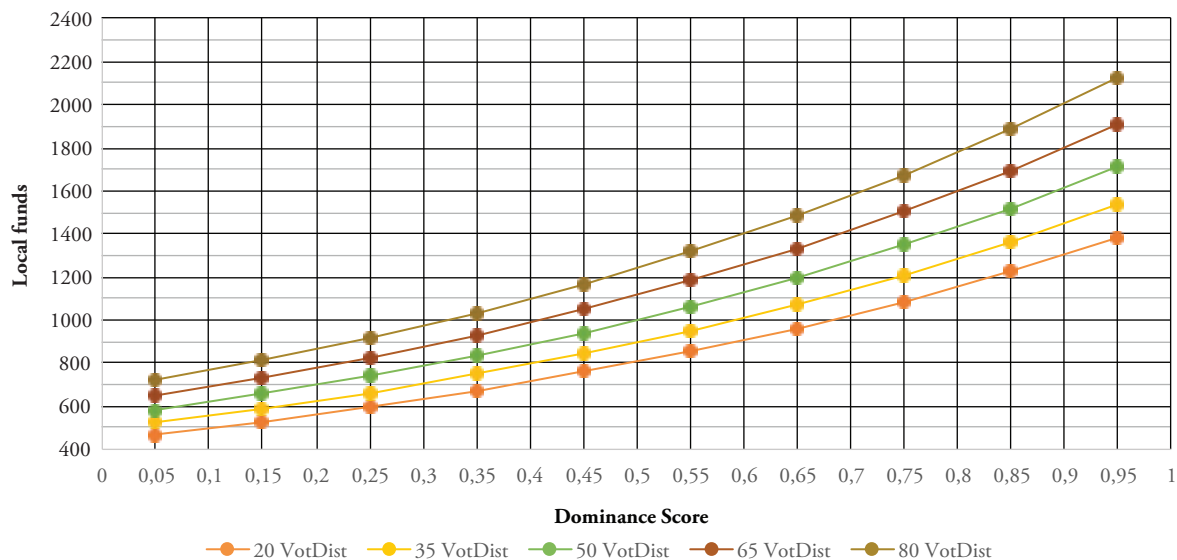
Author´s elaboration using the coefficients of Model VII of Table 3.

city turn their terms in office into a tool of geographic-based representation. The five neighbourhoods where they perform better are what make up their *de facto* constituencies. Given the chance to influence the funding of government programmes, they choose to tailor the ABP in accordance with the needs of their geographic informal constituency. Moreover, the effect of *vote distribution* becomes stronger as this informal constituency becomes fairly free from fellow legislators' incursions. This relationship is clearly seen in the interaction between *vote distribution* and *dominance*.

Using the results seen in Model VII, Figure 5 shows the partial effect of *dominance*vote distribution* on *local funds*, holding all other variables at their mean. The partial effect on *local funds* is plotted on the y-axis as a function of *dominance*. In addition, each curve measures the partial effect at a selected vote distribution score. The distance between them reveals the change in the partial effect of *local funds vis-à-vis* changes in *vote distribution*.[13]

On the top right corner of the graph are the councillors with the highest scores in *vote distribution* and *dominance*. These councillors resemble, to a

reasonable extent, the legislators of first-pass-the-post systems and their single-member constituencies. For most of the scholars working on Brazil, these are the councillors brought into the models.On average they reallocate R$ 2,130 thousand local funds, which is 354% larger than the amount of R$ 470 thousand reallocated by the councillors found on the lower end of the *vote distribution* and *dominance* scales.

Additionally, the interaction term *dominance* living standards* significantly affects how councillors behave in regard to *local funds*.Using the results seen in Model VII again, Figure 6 shows the partial effect of *dominance*living standards* on *local funds*, holding all other variables at their mean. The partial effect on *local funds* is plotted on the y-axis as a function of *dominance*. In addition, each curve measures the partial effect at a selected HDI score. The distance between them reveals the change in the partial effect of *local funds vis-à-vis* changes in *living standards*.

As seen in Figure 6, non dominant councillors with wealthy top 5 neighbourhoods are found on one side, reallocating the least amount of *local funds*, whereas dominant councillors in less pros-

Figure 6
The Interaction of Dominance and Living Standards

Partial Effect of *Dominance* Living Standards on Local funds* (R$ 1,000)
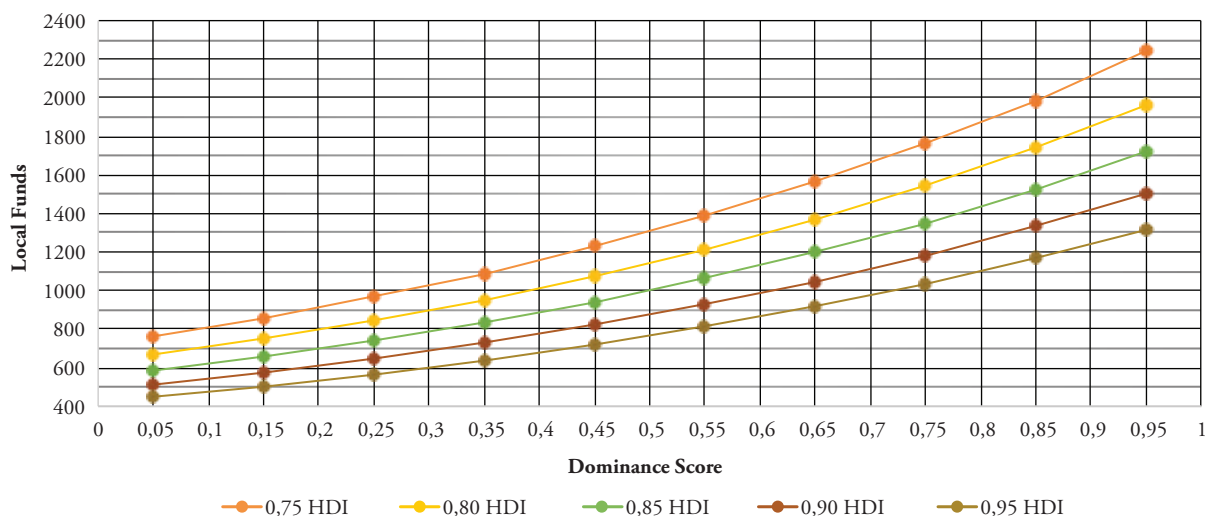
Author´s elaboration using the coefficients of Model VII of Table 3.

perous areas are found on the other, reallocating the most *local funds*.

The amount of *local funds* increases 12% for every 0.05 decrease in the HDI score. Also, the amount of *local funds* increases 13% for every 0.1 increase in the dominance score. A simultaneous change involving a decrease of 0.05 on the HDI and an increase of 0.1 on the dominance score leads to a 29% increase in the amount of *local funds*. Comparing the extremes, on average, a councillor with a 0.75 HDI score and a 0.95 dominance score reallocates an amount of *local funds* 401% larger than a councillor with a 0.95 HDI score and a 0.05 dominance score.

In fact, the effect of *dominance*living standards* is consonance with the deeply rooted imagine of the bailiwick or *curral eleitoral* and the practices intimately associated with it: local leaders holding sway over small poor portions of a territory solely sustained by pork barrel politics.

Although hardly threatened by challengers, dominant legislators nurture a strong depedency on the executive. This is because the budget in Brazil, at all three government levels, is not mandatory. Therefore, even though the ABP must pass in the legislature, the decision on whether or not the budget – including

the budget amendments – is implemented belongs to the executive. Thus the executive chooses which programmes is implemented, when to implement them and how much money is used in their implementation. In one sentence, the executive, alone, decides on a case-by-case basis which of the budget amendments is implemented. This discretionary power is a potent tool *vis-à-vis* the legislature as it allows the executive to induce legislators to cooperate (Pereira and Mueller, 2003; 2004; Ames, 2005).[14]

As the argument goes, there is a chain involving constituents' demands for public services → legislator → executive → constituents' demands heard → pro-government voting on the floor. This dependency is further reinforced in the cases of dominance over areas where living standards are low. It is also found among non dominant legislators who, still, concentrate large share of their votes in a few neighbourhoods.

Former Mayor Cesar Maia (1993-1996; 2001-2004; 2005-2008) explains how this series of exchanges among citizens, legislators and the executive provides the mayor a rather powerful mechanism for forging alliances in the legislature:

The councillors whose electoral fate is tied to a few neighbourhoods came onboard in the fol-

Figure 7
The Three-way Interaction of Dominance, Vote Distribution and Living Standards

Partial Effect of *Living Standards*Dominance* Vote Distribution on Non-territorial Funds* (R$ 1,000)
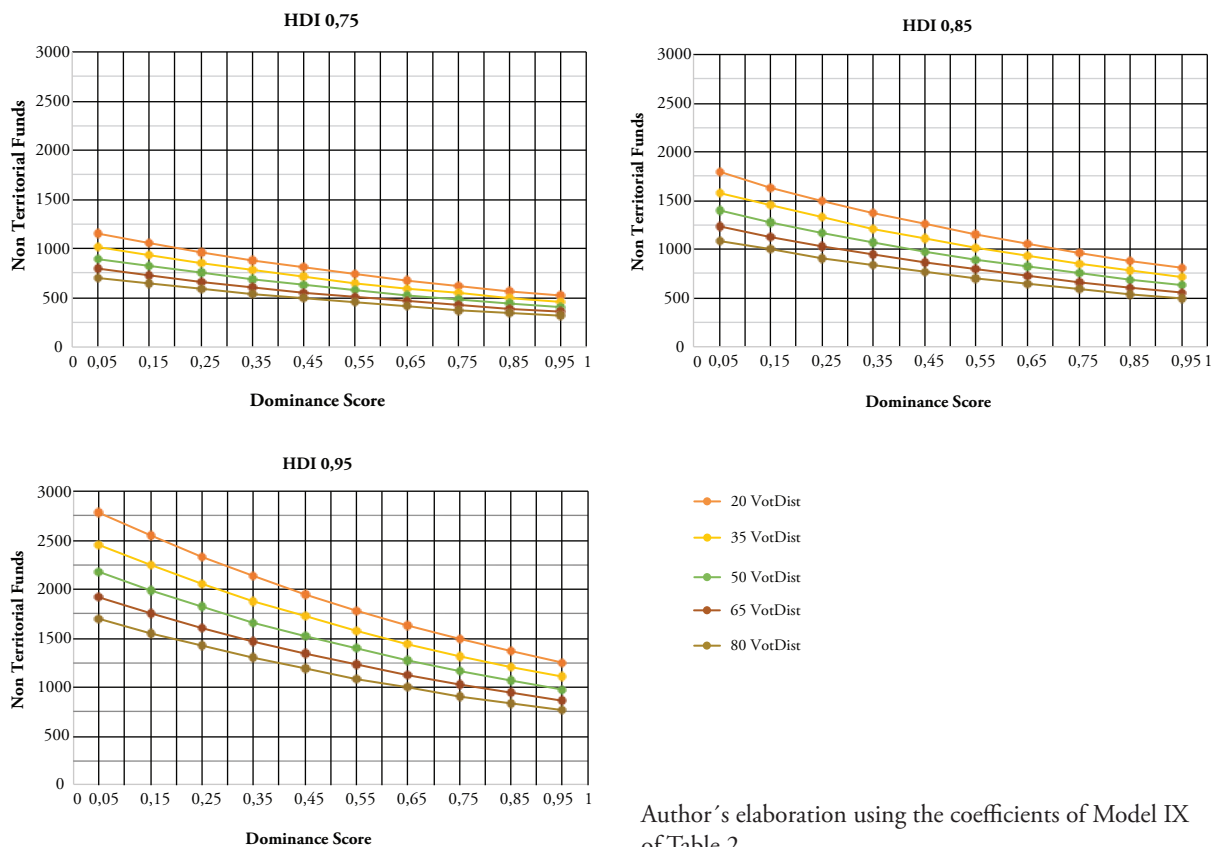
Author´s elaboration using the coefficients of Model IX of Table 2.

lowing day of the inauguration. (...) This does not mean that they will always vote in my favour. You need to give them public works in their area, in their neighbourhoods. This means renewing their loyalty, not gaining loyalty forever (Marques, 2009, p. 59, own translation).

Along those same lines, councillor Rosa Fernandes offers her view of the phenomenon to journalist Sidney Rezende in October 2012. Fernandes concentrates much of her votes in the suburban region of the Great Irajá, where she is largely dominant.

Former Mayor Cesar Maia wanted to marshal the opposition in the council, against Mayor Eduardo Paes. Accordingly, Maia approached me, as we were both affiliated with the same party. But I am too dependent on the executive. I cannot afford to be in the opposition. (...) I am always an ally of the executive. There is no other option. I base my career on the delivery of benefits to a certain area. This is how I work and this is how my constituents expect me to work (Rezende, 2012, own translation).[15]

The relationship between *living standards* and *local funds* is anything but unreasonable as councillors who perform better in areas with low living standards probably face more pressing demands for the proper delivery of public services. Unsurprisingly too the relationship between *living standards* and *non-territorial funds* runs in the opposite direction: the higher the HDI of the top 5 neighbourhoods, the greater the amount of *non-territorial funds* a councillor reallocates.

This effect is strengthened when *living standards* interacts with *vote distribution* and *dominance*. The next graphs represent the three-way interaction effect of *living standards*dominance*vote distribution*. The graphs show *living standards* at three different HDI scores: 0.75, 0.85 and 0.95. The partial effect on *non-territorial funds* is plotted on the y-axis as a function of *dominance*. Each curve measures the partial effect at a selected vote distribution score. The distance between them shows the change in the partial effect of *non-territorial funds vis-à-vis* changes in *vote distribution*, holding all other variables at their mean.[16]

The reallocation of *non-territorial funds* clearly increases as dominance and vote distribution scores decrease. It is evident, too, how the interaction effect between *dominance* and *vote distribution* is further reinforced across the board as *living standards* goes up from a 0.75 to a 0.95 HDI score. Therefore, together, changes in *living standards*, *dominance* and *vote distribution* have a significant impact on *non-territorial funds*.

In short, non dominant legislators whose votes are widely dispersed over the territory of mainly wealthy areas centre their effort in funding non geographic public policies. Far from more urgent demands for state action, these councillors see themselves as representatives of social segments or ideological platforms while at the same time unable to play the card of the local leader responsible for delivering fragments of government programmes to specific neighbourhoods.

The Binary – Logit – Model

The models for *local funds* render no significant results at all, showing that the chances that a councillor will never reallocate any *local funds* does not significantly change as a consequence of (1) serving/having served on the *CFBFO*; (2) being a *fresher*; (3) concentrating most of the votes in a particular region other than *South Zone, Centro& North Zone*.[17] The figures for *non-territorial funds* tell a different story. Because there are no differences among the levels of significance as well as among the coefficients, except, if any, for the third decimal place, I display only the outcome of Model I.

Apart from my argument regarding *freshness*, my hypotheses are corroborated. Starting with the regional hypotheses, except for *Suburbs*, the sign and the significance level of the coefficients are all the expected ones. In sum councillors from *South Zone, Centro & Tijuca* are more likely to fund broad public policies than their fellow legislators from the other four regions of the city.[18]

Table 5 also confirms the importance of the *CFBFO* membership: sitting or having sat on the *CFBFO* increases by 55% the chance of submitting at least one budget amendment reallocating *non-territorial funds*. Thus, be it because of collusion, influence or better understanding of the budgetary process, legislators with experience in the CFBFO are far more likely to use the amending power of prioritising the targeting of government programmes.

Final remarks

I believe the previous pages have provided a less caricatural and more accurate and diverse account of legislators' behaviour under OLPR systems. The electoral connection does have a rather powerful effect, as the theory predicts. This is not however a one-dimensional influence, as on their own particular manner comparativists and researchers specialised in Brazil see it. On the contrary, the different patterns of territorial distribution of votes create different sets of incentives, which lead to different behaviours.

Additionally, apart from teasing out the effect of the electoral connection, I believe this paper contributes to the long-lasting debate on the electoral reform in Brazil.

A much frequently mentioned weakness of the OLPR system is its alleged lack of accountability (Silva *et al.*, 2015).[19] Nevertheless, the day-to-day activities of legislators in the legislature itself, outside it and in social media platforms show that the ties between representatives and constituents are far from being as ephemeral as reformers claim (Kuschnir, 2000a; 2000b; Marques *et al.*, 2014; Viera, 2017). Moreover, as seen in the Table 6, the overwhelming majority of the councillors in Rio de Janeiro roughly repeats the same territorial distribution of vote election after election. In other words, the informal constituencies do express a solid long-term relation-

Table 4
Zero-inflated Negative Binomial Models – Binary Component – *Non-territorial Funds*

Dependent variable: *Non-Territorial Funds*

Observations & Model Fit	Model I
Observations	466
Non zero observations	308
Zero observations	158
Wald test (p-value)	0.000
/lnapha=0	0.166***

Variable	Model I	Variable	Model I
South Zone, Centro & North Zone	-0.606 (0.460)	Year 2001	-1.549** (0.754)
Suburbs	0.335 (0.296)	Year 2002	-1.190* (0.632)
Ilha do Governador	2.077* (1.097)	Year 2003	-2.156*** (0.520)
Barra & Jacarepaguá	1.075** (0.530)	Year 2004	-1.243* (0.638)
West Zone	0.872*** (0.318)	Year 2005	-1950*** (0.753)
Fresher	0.235 (0.354)	Year 2006	-1348** (0.602)
Fresher with relatives	0.257 (0.670)	Year 2007	-1570*** (0.612)
CFOFF	-0.793** (0.356)	Year 2008	-0.033 (0.600)
Year 1998	-0.802 (0.626)	Year 2009	-1340** (0.669)
Year 1999	-0.297 (0.639)	Year 2010	-1.719*** (0.595)
Year 2000	0.241 (0.574)	Lag Non Territorial Funds	0.000*** (0.000)
		Constant	0.475 (0.522)

Note: Robust standard errors in parentheses. *** significant at the 0.01 level. ** significant at the 0.05 level. * significant at the 0.1 level.
Author´s elaboration using data collected from the RJCC website, the Brazilian Electoral Court website and the Instituto Pereira Passos website, available at www.camara.rj.gov.br, www.tse.jus.br and armazemdedados.rio.rj.gov.br.

Table 5
Regions – The Chance of a Councillor to Reallocate At Least Some Amount of *Non-territorial Funds*

Region	More Chance of Not Amending the ABP than No-Prevalent Region	Significant Effect	Expected Behaviour
South Zone, Centro & North Zone	45%	No	No significant difference expected
Suburbs	40%	No	Yes
Ilha do Governador	698%	Yes	Yes
Barra & Jacarepaguá	193%	Yes	Yes
West Zone	139%	Yes	Yes

Author´s elaboration using the coefficients and significance levels reported in Table 4.

Table 6
Correlation Between the Territorial Distributions of Vote in Two Consecutive Elections

Elections / Range	1996-2000		2000-2004		2004-2008		Total	
	Councillors		Councillors		Councillors		Councillors	
	N	%	N	%	N	%	N	%
Below 0.6	5	14.7	5	14.3	3	8.1	13	12.3
From 06. to 07	1	2.9	3	8.6	4	10.8	8	7.5
From 0.7 to 0.8	5	14.7	6	17.1	1	2.7	12	11.3
From 0.8 to 0.9	8	23.5	7	20	4	10.8	19	17.9
From 0.9 to 1	15	44.1	14	40	25	67.6	54	50.9
Total	34	100	35	100	37	100	106	100

Author´s elaboration using data collected from the Brazilian Electoral Court website, available at www.camara.rj.gov.br, www.tse.jus.br and armazemdedados.rio.rj.gov.br.

All coefficients are significant at the 0.01 level, except for four coefficients below 0.6 in 1996-2000 and for two cofficients below 0.6 in 2000-2004, which are insignificant.

ship involving representatives and constituents or, at least, subsets of constituents.[20]

As seen in the Total column, on average half of the councillors attain a nearly perfect correlation, reaching coefficients between 0.9 and 1. Slightly above one third displays figures ranging from 0.6 to 0.9, still fairly high values. Thus, close to 90% garner their votes systematically in about the same territory.[21]

Still, critics argue that legislators would easily and often abandon their constituencies for different ones from one election to the other because of the remarkable flexibility of the electoral rules. Thus, citizens, although unhappy with their representa-tion, would have no power to inflict any penalty on runaways, who, having a large territory from which to seek votes, would just smoothly land elsewhere and manage to keep their seats thanks to deals struck with local leaders. (Ames, 2005; Almeida, 2006).

Such *modus operandi* is indeed frequently used to portray the behaviour of legislators in Brazil. Yet, it is an expedient available to a tiny minority: the political machines´ higher-ups and politicians with particularly close ties with big business. A strategic access to state and party resources and/or campaign donors allows them to seal alliances with key players in local politics, who in return deliver blocks of votes.[22]

The single non-transferable vote (SNTV) or *distritão*, as nicknamed in Brazil, perfectly serves this very same *modus operandi* and has received enthusiastic support from Mr. Temer and PMDB most prominent bosses (Temer, 2015). The SNTV at once surpasses the OLPR system in terms of deleterious effects on party organisation and the amount of money needed to run wide-ranging campaigns, centred exclusively on individual candidates (Nicolau, 2017a).[23]

On a much different direction, some reformers see rank-ordered party lists as a means of strengthening parties' programmatic identities while diminishing the incentives for individual legislators to cultivate the personal vote and, therefore, the alleged endemic distributive logic of the legislature (Shugart and Carey, 1992; Ames, 2005; Ministério da Justiça, 2009; Comissão Especial de Reforma Política, 2012).

However, there is no reason to see rank-ordered lists as intrinsically free from the rationale of pork politics, as clear evidence from Costa Rica shows. When deciding on their closed lists in national legislative elections, Costa Rican parties choose to pick names with regional appeal, rather than policy-oriented members. Once elected, these candidates turn into legislators prodigious in the supply of local benefits to their constituencies (Taylor, 1992). Neither does the adoption of ranked-ordered list *per se* guarantee another much desirable goal: less costly majority-building processes, which might be achieved under the OLPR system by the introduction of an electoral threshold and/or a ban on electoral coalitions in legislatives races.[24]

These last lines are in no way a sweeping praise of the OLPR system. Even experts on Brazil who openly advocate for its maintenance stress the need for some adjustments (Nicolau, 2017b). As any other set of rules, it has its pros and cons, depending on different points of view, and must be assessed in the light of its context. Yet, along the lines of Nicolau (2007), who warns us about how we are still groping in terms of the workings of the electoral connection amid pervading intraparty competition, I believe we should avoid being lured into slapdash changes, which, implemented as promises of a certain foreseeable reality, might in truth end up delivering unwished consequences.

Appendix 1
Independent Variables – Binary Model

IV Name	Code	Expected Effect on DV on Local Funds	Expected Effect on DV on Non-Territorial
South Zone, Centro & North Zone	01 if councillor concentrates 50% or more of the votes in the region. Reference group: councillors who do not concentrate most of the votes in any region (no prevalent region).	No significant effect	
Suburbs		0 to 01 in IV leads to greater chance of DV ≠ 0	0 to 01 in IV leads to smaller chance of DV ≠ 0
Ilha do Governador			
Barra & Jacarepaguá			
West Zone			
Fresher	0 if councillor has less than two years in office. Reference group: councillors with two or more years in office.	0 to 01 in IV leads to smaller chance of DV ≠ 0	
Fresher with relatives	0 if councillor is relative of a former councillor or has less than two years in office. Reference group: councillor with two or more years in office.	No significant effect	
CFOFF	0 if councillor does not sit or has not sat on the committee. Reference group: councillor who sits or has sat on the committee.	0 to 01 in IV leads to greater chance of DV ≠ 0	

Author´s elaboration

Appendix 2
**Territorial Distribution of Votes in Two Consecutive Elections**

Councillor Carlos Bolsonaro - 2000 and 2004 Elections
Correlation coefficient of 0.92
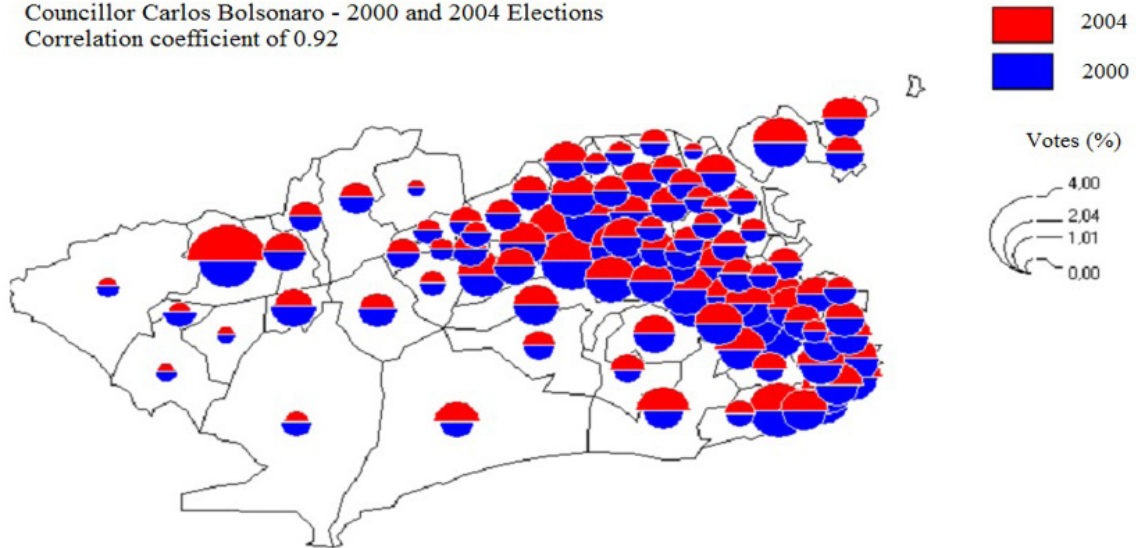
Author´s elaboration using data from the Brazilian Electoral Supreme Court - http://www.tse.jus.br.
Made with Philcarto - http://perso.club-internet.fr/phigeo.

Appendix 3
Territorial Distribution of Votes in Two Consecutive Elections

Councillor Luis Carlos Aguiar - 1996 and 2000 Elections
Correlation coefficient of 0.99
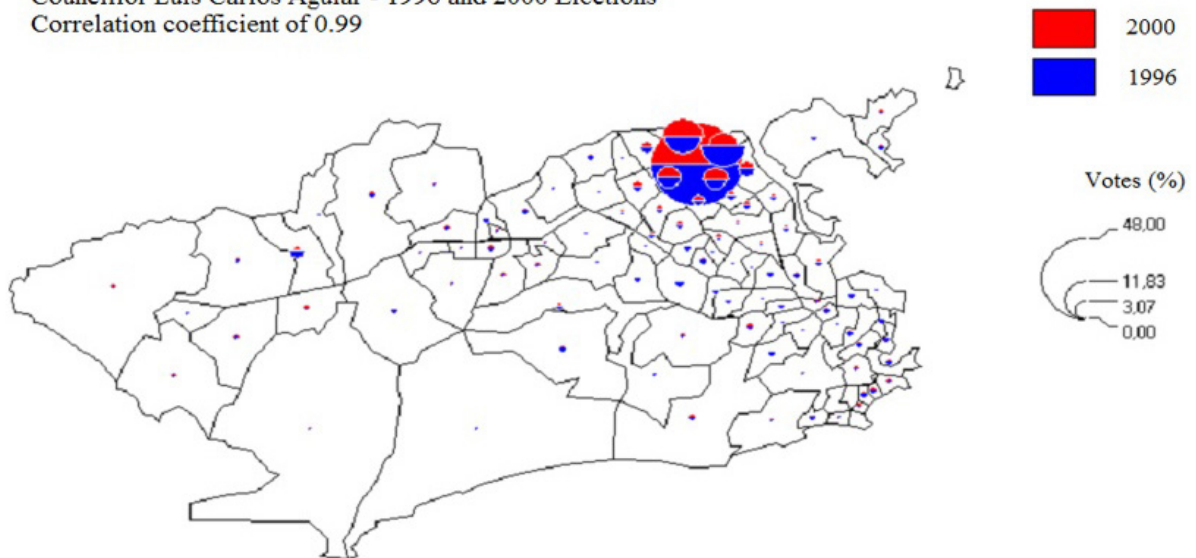
Author´s elaboration using data from the Brazilian Electoral Supreme Court - http://www.tse.jus.br.
Made with Philcarto - http://perso.club-internet.fr/phigeo.

Notes

1 The Brazilian OLPR system adds together all the strongest incentives for legislators to cultivate a personal vote. Unlimited reelection is allowed, parties may launch a rather large numbers of candidates, candidate selection process takes place far from the central leadership and campaigns – including fund raising strategies – are run as individual enterprises. More important, regarding the ballot structure, the personal vote alone determines the place of each candidate on the party list.

2 In contrast, Brazilian anthropologists have advanced significantly in understanding the relations between legislators and their constituents (Kuschnir, 2000a; 2000b; 2001; Lopez, 2004; Santos, 2005; Siqueira, 2009; Garcez *et al.*, 2009).

3 *The Deadlock of Democracy in Brazil* (2005) was first published in 2001. The book is a collection of papers produced from the late 1980s onwards.

4 Despite considering the living standards, Ames (2005) emphasises the importance of vote distribution and dominance.

5 Ames (2005), as well as the other authors mentioned in this section, looks at the national Chamber of Deputies, whose members´ formal constituencies are the state whole territory.

6 Carvalho (2003) uses his own indicators of dominance, distinct from Ames' (2005).

7 Since 1995 each member of the National Congress has an individual quota of funds to reallocate through budget amendments (Pereira and Mueller, 2004).

8 In fact, there are 159 rather than 140 neighbourhoods in Rio de Janeiro. However, not all of them have polling stations in their territory, which means that people are registered in nearby neighbourhoods. I decided to deal with this issue by joining together the neighbourhoods without any polling stations and the more similar contiguous neighbourhoods in terms of their living standards, measured as their score on the Human Development Index (HDI). For instance, the neighbourhood of Gardênia Azul, which does not have any polling station, is contiguous to Jacarepaguá, Freguesia, Cidade de Deus and Anil. Its HDI score in 2000 was 0.77 while Jacarepaguá's was also 0.77 and Freguesia's, Cidade de Deus' and Anil's were respectively 0.90, 0.75 and 0.91. Since Gardênia Azul and Jacarepaguá have the same HDI score, they have been joint together in the dataset and treated as one neighbourhood. The neighbourhoods without any polling stations and the neighbourhoods with which they were combined – in parenthesis – are the following: Complexo do Alemão (Ramos), Complexo da Maré (Bonsucesso), Engenheiro Leal (Cavalcanti), Gamboa (Centro), Gardênia Azul (Jacarepaguá), Grumari (Recreio dos Bandeirantes), Itahangá (Barra da Tijuca), Jacarezinho (Jacaré), Joá (Barra da Tijuca), Manguinhos (Bonsucesso), Parque Anchieta (Ricardo de Albuquerque), Parque Colúmbia (Acari), Pitangueiras (Cacuia), Praça da Bandeira (Tijuca), Praia da Bandeira (Cocotá), Rocinha (São Conrado), Sampaio (Jacaré), Senador Vasconcelos (Santíssimo) and Vasco da Gama (São Cristóvão).

9 Appendix 1 explains the coding, measuring and expected effects of the independent variables on the dependent variables in the binary model.

10 Regarding Party Ideology, Kinzo (1993) and Rodrigues (1995) arrive at fairly similar categorisations: left – PT, PDT, PSB,PSol, PCdoB; centre-left – PMDB, PPS, PV; centre-right – PHS, PL/PR, PMN, PRB, PRTB, PSC, PSDB, PSDC, PTB, PTC, PTdoB, PTR; right – PPB, PFL/Democratas, Prona.

11 It is not possible to perform the Vuong test, which indicatesthe more appropriate model – the Zinb or the standard negative binomial – using robust standard errors. Therefore I separately ran the nine models with standard errors, including the Vuong test. The scores, all significant at the 0.01 level, are between 3.45 and 3.48 for the *non-territorial funds* regressions and 2.48 and 3.39 for the *local funds* regressions. Thus numbers clearly favour the Zinb model.

12 The percentage change in the expected amount of funds reallocated is found using the formula 100*[(expß) -1] (Long, 1997, p. 228; Hilbe, 2011). The same formula is applied to interpret the logit models.

13 The analysis of interaction terms coefficients in nonlinear models deserves extra caution. As Greene (2010) warns us, the interpretation of the magnitude of the effect on the dependent variable based on the value of the coefficient may frequently be unreasonable and misleading. Instead, graphically representing the partial effect of the interaction term is more informative, which is how I proceed.

14 The Constitutional Amendment no86, promulgated on the 17th of March, 2015, made the implementation of the budget amendments sponsored by individual legislators mandatory (Brasil, 2015).

15 Sidney Rezende (2009) has also interviewed councillor Dr. Carlos Eduardo, in 2009. Dr. Carlos Eduardo, a physician, whose votes are fairly well distributed across the entire city, is a member of the government coalition.

However, in stark contrast with Fernandes, during the whole ten-minute interview, he mentions no other topic than the city public health care system and its deficiencies, showing no special interest in any specific geographic area. The interview is available at http://www.youtube.com/watch?v=97auw86xLw0, accessed in 21/12/2012.

16 In the presence of interaction, the main effects, such as those of *vote distribution* and *living standards* in Model IX, are no longer meaningful; instead, the interpretation should focus on the interaction terms (Mitchell, 2012, chapter 6).

17 In fact, the coefficient of *Ilha do Governador* does have a significant impact. However, the idea here is to verify whether or not the *South Zone, Centro & North Zone* does distinguish itself from the other regions regarding the budget amending process. Therefore, a comprehensive test of the hypothesis demands an interpretation of the five coefficients all together. Proceeding in such way, looking at the whole set of regional coefficients, all but one with no significant effect, we may infer that there is no significant difference among the distinct regions of the city.

18 Alternatively, I ran a separate binary component model testing the effect of *party ideology*, which turned out to be insignificant, as expected.

19 Alternatively, Miguel (2010) provides a positive view of the accountability in OLPR systems.

20 The table includes information on main office holders only. The city of Rio de Janeiro is divided into 97 electoral zones. The coefficients result from the correlation between each electoral zone in two consecutive elections in terms of their contribution to the individual councillor's total vote. Thus, for instance, councillor A's territorial distribution of vote in the 1996 election is correlated with councillor A's territorial distribution of vote in the 2000 election, electoral zone by electoral zone.

21 Appendices 2 and 3 shows two examples of how the patterns of vote distribution in different elections almost perfectly correlate.

22 This is the case of former president of the Chamber of Deputies, Eduardo Cunha, who, during his 2014 campaign, seldom shook any hands out on the streets but much frequently made brief appearances in popular gathering carefully staged in evangelical churches and eminent civic organisations across many small towns (Serodio, 2014).

23 The *distritão* was voted down in the Chamber of Deputies in 2015 and 2017. Despite parliament's decision to keep the system essentially unmodified, justices from the Supreme Court as well as the chiefs of the executive and of the legislative still insist in the need of radically changing the rules (Galli, 2017; Noblat, 2017).

24 In fact, the Constitutional Amendment no 97, promulgated on the 4th of October 2017, establishes an electoral threshold for parties to access public funding and free radio and television time for their election campaigns, beginning at 1.5% in 2018 and reaching 3% from 2030 on. This same amendment bans electoral coalitions in legislative races, starting in the 2020 local election (Brasil, 2017).

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