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[Technical note]

GeoDesp: A Database that Identifies where Candidates Spend their Campaign Expenses*

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Resumo

GeoDesp: uma Base de Dados que Identifica o Local onde Candidatos Realizam suas Despesas de Campanha

Nesta nota técnica, apresentamos uma base de dados inédita que soluciona um grande problema no estudo das estratégias eleitorais: a ausência de dados que permitam identificar onde, quando e como os candidatos realizam atividades durante a campanha eleitoral. O Tribunal Superior Eleitoral (TSE) disponibilizou os registros de receitas e gastos realizados durante a campanha de cada candidato. Dentre as muitas informações contidas ali, coletamos o número do banco e da agência do beneficiário das transações indicadas pelos candidatos e cruzamos com uma lista com endereço das agências bancárias no Brasil. A partir desses cruzamentos, pudemos georreferenciar os gastos dos candidatos ao legislativo nacional para todo o país e assim construir uma *proxy* das estratégias de campanha na disputa eleitoral. Esta base de dados inédita permitirá que consigamos avançar na compreensão de como a campanha eleitoral é construída, quais estratégias são empregadas e também como se dá a relação entre representantes e cidadãos, uma vez que será possível dissociarmos os esforços de campanha do resultado da eleição.

Palavras-chave: estratégias eleitorais; despesas de campanha; geografia eleitoral; eleições 2018

Abstract

GeoDesp: A Database that Identifies where Candidates Spend their Campaign Expenses

In this technical note, we present an unprecedented database that solves a major problem in the study of electoral strategies: The lack of data to identify where, when, and how candidates carry out activities during the electoral campaign. The Superior Electoral Court (TSE) has made available the records of income and spending during each candidate's campaign. Among the many pieces of information contained therein, we collected the bank and branch numbers of the beneficiaries of the transactions indicated by the candidates and cross-referenced them with a list of bank branch addresses in Brazil. From these cross-references, we were able to georeference the spending of candidates for the national legislature for the whole country and thus build a proxy of campaign strategies in the electoral contest. This unprecedented database will allow us to advance our understanding of how electoral campaigns are designed, what strategies are employed, and how the relationship between representatives and citizens takes place, since it will be possible to dissociate campaign efforts from the outcome of the election.

Keywords: electoral strategies; campaign spending; electoral geography; 2018 elections

Résumé

Geodesp: Une Base de Données qui Identifie le Lieu où les Candidats Réalisent leurs Dépenses de Campagne

Dans cette note technique, nous introduisons une base de données innovante qui résout une lacune importante dans l'étude des stratégies électorales : l'absence de données permettant d'identifier où, quand et comment les candidats réalisent des activités pendant la campagne électorale. Le Tribunal Supérieur Électoral (TSE) a rendu disponibles les enregistrements des revenus et des dépenses de chaque candidat pendant la campagne. Parmi les nombreuses informations contenues, nous avons collecté le numéro de la banque et de l'agence du bénéficiaire des transactions indiquées par les candidats et les avons croisés avec une liste d'adresses des agences bancaires au Brésil. Grâce à ces croisements, nous avons pu géoréférencer les dépenses des candidats au législatif national pour tout le pays et ainsi construire une proxy des stratégies de campagne dans la compétition électorale. Cette nouvelle base de données nous permettra de mieux comprendre comment se structurent les campagnes électorales, les stratégies adoptées, et la relation entre les représentants et les citoyens, en permettant de dissocier les efforts de campagne des résultats électoraux.

Mots-clés : stratégies électorales; dépenses de campagne; géographie électorale; élections 2018

Resumen

GeoDesp: una Base de Datos que Identifica dónde los Candidatos Hacen sus Gastos de Campaña

En esta nota técnica, presentamos una base de datos sin precedentes que soluciona un gran problema en el estudio de las estrategias electorales: la falta de datos que permitan identificar dónde, cuándo y cómo los candidatos realizan actividades durante la campaña electoral. El Tribunal Supremo Electoral (TSE) ha puesto a disposición de los ciudadanos los registros de ingresos y gastos durante la campaña de cada candidato. Entre las muchas informaciones que contienen, recogimos los números de banco y de sucursal de los beneficiarios de las transacciones indicadas por los candidatos y los cruzamos con una lista de direcciones de sucursales bancarias en Brasil. A partir de estas referencias cruzadas, pudimos georreferenciar los gastos de los candidatos a las legislativas nacionales para todo el país y construir así un proxy de las estrategias de campaña en la contienda electoral. Esta base de datos sin precedentes nos permitirá avanzar en la comprensión de cómo se construye la campaña electoral, qué

estrategias se emplean y también cómo se produce la relación entre representantes y ciudadanos, ya que será posible disociar los esfuerzos de campaña del resultado de las elecciones.

Palabras-clave: estrategias electorales; gasto de campaña; geografía electoral; elecciones 2018

Introduction

The outcome of an election depends on several factors. Among the most fundamental are the campaign efforts of the candidates involved. The strategies used to publicize each candidate's platform bring information to the electorate in heterogeneous ways, due to the strategies adopted, the resources available to the campaigns, the personal characteristics of the candidates, and even the geographical and social environment in which the message circulates. The interaction between these many factors makes the information reach the voters and they decide who to vote for (as in Johnston *et al.*, 2016; Lau, Redlawsk, 2006; Oscarsson, Rosema, 2019). Thus, observing campaign strategies is fundamental to understanding the outcome of an electoral contest.

The literature that studies the Brazilian case usually assumes that the places in which each candidate received votes derive from the direct intention of the individual, taking, for example, vote dispersion maps as an indication of political representation in an electoral district (e.g. Ames, 2001). However, this is partially correct, since it not only fails to consider the interaction of the actions of the various candidates (implicitly taking their strategy of convincing the voter as effective), but also neglects the heterogeneous effect of the dispersion of information over the territory and thus which voter is reached by the message of any given politician (e.g. Guarnieri, Silva, 2022). In other words, strategic decisions on whether or not to regionalize a campaign will not result in a certain a priori effect on the dispersion of the vote that we will observe for the candidates as a whole at the end of the election.

In this technical note, we present an unprecedented database to help us solve these problems. The Superior Electoral Court (TSE) has made available, on its website for the Disclosure of Candidatures and Electoral Accounts (https://divulgacandcontas.tse.jus.br), the records of income and expenditure made during each candidate's campaign. Among the many pieces of information contained therein, we collected the bank and branch numbers of the beneficiaries of the transactions indicated by the candidates and cross-referenced them with a list of the addresses of bank branches in Brazil available on the website of the Central Bank of Brazil (https://www.bcb.gov.br/fis/info/agencias.asp?frame=1), with the aim of associating campaign spending with the regions of the district. We also linked this data to the candidates' declared spending, in order to initially evaluate the nature of the spending. Based on these cross-refer-

ences, we were able to georeference the spending of candidates for the national legislature for the whole country and thus build a proxy for the regionalization of the campaign in the electoral contest.

This unprecedented database will allow us to advance our understanding of how the electoral campaign is constructed, what strategies are employed and how the relationship between representatives and citizens takes place, since it will be possible to dissociate campaign efforts from the election result. The latter is the conclusion of an extensive process of interaction between candidates and between candidates and voters. Therefore, an election does not only depend on the intentional actions of the former, but, as said, on a series of interconnected factors that affect how a citizen decides to vote. Political science will thus be able to advance theoretically with regard to an essential characteristic of elections and empirically concerning the national case. In addition to this introduction, this text is divided into a section that presents the database and another with examples of how it allows us to answer a series of substantive questions, analyzing the information for the state of São Paulo. We close this technical note with some final considerations.

Data

The data made available by the TSE and its georeferencing based on cross-referencing with data from the Central Bank enabled the creation of a database that provides information on the municipality where each federal deputy candidate in the 2018 elections, who declared their expenses, made the expenditure. Since the district for the national and state legislative elections in Brazil is the state, we built a database for each of them with information on the candidate, the expense, and the municipality where it was made. As an example of the use of this database, we will analyze campaign strategies in the state of São Paulo. The variables available for this state are also available for all the other states.

Example: Electoral Strategies in São Paulo

In 2018, there were 1,686 candidacies for a seat in the Chamber of Deputies in São Paulo, of which 1,483 were accepted (176 were rejected and there were 27 resignations). All candidacies, whether accepted or not, are listed in the TSE database. All financial transactions in a campaign must be made through bank accounts opened by the candidate and these are then made public.

Of the 1,483 approved candidacies, information was obtained on 1,229 with some financial transactions. These included, in addition to payments of campaign expenses, financial investments, payments of fees, taxes, refunds, etc., and transfers to other campaign accounts. Of these transactions, we selected checks, deposits, payments, and transfers as identifiers of direct campaign expenses with service providers as expenses that would allow us to highlight the regional efforts undertaken by the candidates.

The first step in associating the campaign with the territory is to link the spending to the locations in the district. For this step, we collected the bank and branch number of the beneficiary of each declared transaction - a payment, check issue, deposit, or transfer - and cross-referenced it with a list of bank branches in Brazil available on the website of the Central Bank of Brazil. Some municipalities could not be identified because the branch number was not on the list or on the bank's website. This procedure allowed to know the cities in which the beneficiaries of each candidate's expenditure were located and thus gave us a glimpse of the regions that the politicians traveled to throughout their campaigns.

Of the approved candidates who used their campaign accounts and carried out any of the selected transactions, we were able to identify the municipality of these transactions for 1,187 candidates, 70% of those who competed in the elections for the Chamber of Deputies in São Paulo and 80% of the approved candidacies, as shown in Table 1.

Table 1
Number of candidates in the database

Type	Quantity	% of those accepted
Candidates	1,686	-
Accepted	1,483	100
With an identified municipality	1,187	80

Source: Prepared by the authors using data available on the TSE's Disclosure of Candidatures and Electoral Accounts website. (https://divulgacandcontas.tse.jus.br/divulga/#/estados/2018/2022802018/SP/candidatos).

The bank statement data for candidates' accounts originally has 30 variables. These include information on who the candidate providing the account is, with their respective party affiliation; information on the transaction, such as date, type of entry, bank details - bank, branch, and account - for both the politician and the service provider; and data on

the service provider and the source of funds used in the transaction - whether special campaign funds, party funds, or others. This database was cross-referenced with the candidates' information, resulting in the database of interest. The final structure of the database for the state of São Paulo, after removing the transactions for which the municipality was not identified, has 78,161 observations (financial transactions) and 15 relevant variables, as described in Table 2.

Table 2
Description of variables in the database

Variable	Description
numcand	Candidate number
cnpjCand	Company Registration Number (CNPJ) of the candidate's campaign
cpfCand	Candidate's Individual Taxpayer Registry Number (CPF)
nome	Candidate's full name according to TSE
nurna	Name used by the candidate on the ballot
partido	Candidate's party
valor	Transaction amount in R$
cpfBene	Beneficiary's CPF
municipio	Municipality where the branch is located
muncand	Municipality where the candidate made most of the transactions
uf	State in which the dispute took place
TSEcod	Code assigned by the TSE to the municipality where the transaction took place
IBGEcod	Code assigned by the IBGE to the municipality where the transaction took place
situacao	Whether the candidate was elected or not, whether they are a substitute and whether they were elected by party quotient or by mean
votos	Voting for the candidate in the municipality where the transaction took place

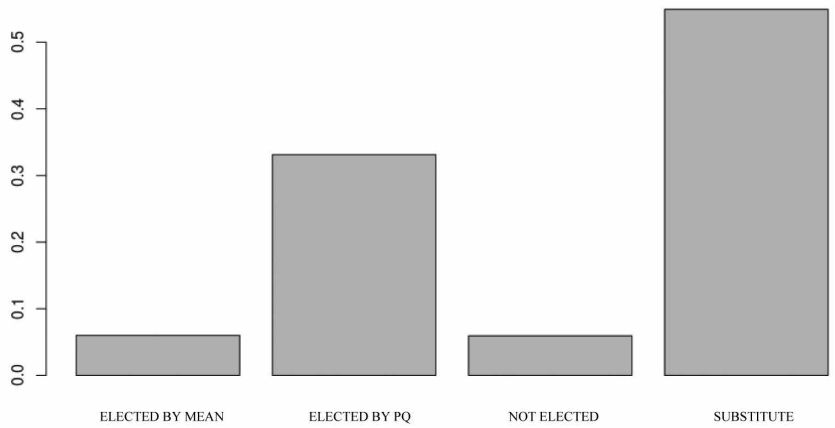
Source: Prepared by the authors using data available on the websites of TSE's Disclosure of Candidatures and Electoral Accounts (https://divulgacandcontas.tse.jus.br/divulga/#/estados/2018/2022802018/SP/candidatos) and the Central Bank of Brazil (https://www.bcb.gov.br/fis/info/agencias.asp?frame=1).

Candidates' Financial Transactions

Most of the 78,161 transactions in the campaign accounts of federal deputy candidates were made by check (almost 60% - the most common type of transaction) and accounted for around 28.5% of the amounts spent (behind only DOCs and TEDs, which accounted for 30.1%). The average value of these transactions per check was R$3,144.10 and the median was R$632.20.

Figure 1 shows the frequency distribution of financial transactions according to the candidates' post-election situation.

Figure 1
Distribution of the number of financial transactions according to the candidate's situation



PQ: Party quota.
Source: Prepared by the authors based on TSE data.

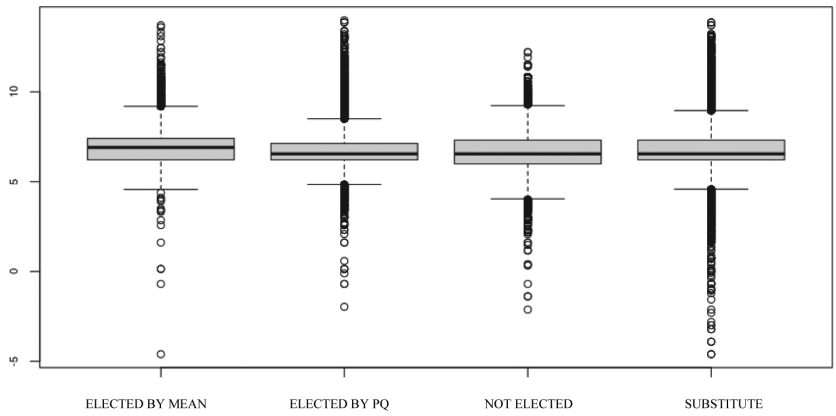
Although those elected by party quotient make up only 4% of the base, they account for more than 30% of total transactions. The non-elected, 33% of the base, made only 8% of the transactions. This difference suggests a correlation (not explored here) between the number of transactions and the likelihood of being elected, i.e. the number of services contracted seems to be a good predictor of the election results.

The figure below shows that the average amount spent does not vary with the status of candidates. This is consistent with the correlation found by other authors between campaign spending and the likelihood of being elected (Figueiredo Filho, 2005; Pereira, Rennó, 2007; Peixoto, 2012; Speck,

Cervi, 2016). Interestingly, our data allows us to explore a mechanism by which money would impact the vote: The difference would be in the types of spending made and not in their total amount.

Additionally, we used the CNPJ/CPF of the candidates and beneficiaries to cross-check with the campaign spending database made available by the TSE. This cross-check showed that elected candidates spent higher amounts on average on items that suggest a greater concern with the local presence of their campaign (such as spending on rallies, the acquisition/donation of movable and immovable property, and the physical pre-installation of the campaign committee), as well as on increasing the dissemination of their proposals (with spending such as producing jingles, and boosting content and advertising in newspapers, magazines and television), as shown in Figure 2.

Figure 2
Mean value of candidate transactions by electoral status



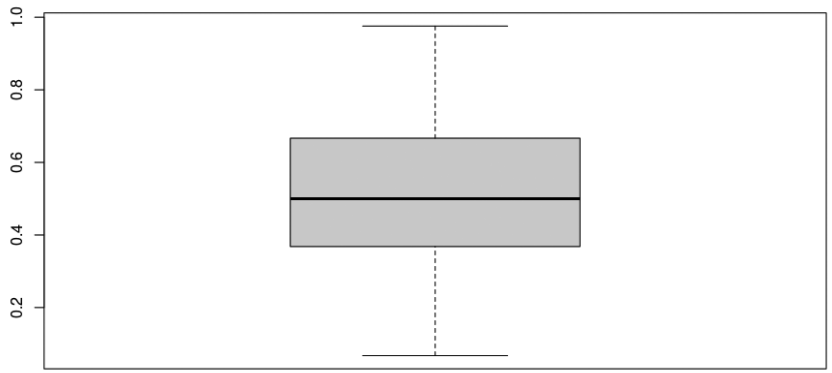
PQ: Party quota.
Source: Prepared by the authors based on TSE data.

Spatial Distribution of Transactions by Candidate

Evaluation of mean spending alone can disguise the differences between politicians' profiles, regional considerations, and different strategies. In this sense, another possibility for evaluating spending lies in its spatialization in the territory.

Half of the candidates (50%) paid for goods and services in four or fewer municipalities, 75% in seven or fewer, which shows the high regional concentration of these expenditures. Even when payments were made in more than one city, the transactions in the municipality where they occurred most often accounted for more than 50% of all transactions, as shown in Figure 3.

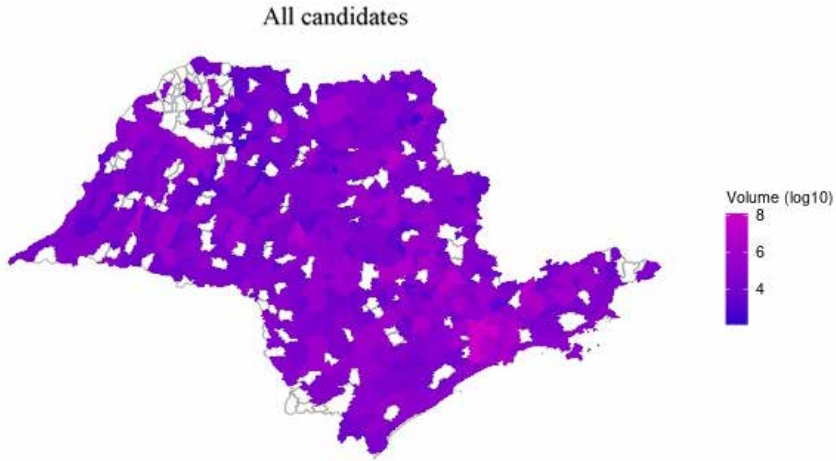
Figure 3
Distribution of the proportion of transactions carried out in the dominant municipality, i.e. the one where the candidate carried out most of their transactions



Source: Prepared by the authors based on TSE data.

In total, transactions were recorded in 887 municipalities, more than the 645 cities in São Paulo. We will not investigate here why candidates for federal deputy for São Paulo hire services in distant places, such as Porto Alegre and Manaus. Instead, we will focus on the spatial distribution of spending in the state, where there were transactions in 494 municipalities. Figure 4 below shows the regional dispersion of resources across the state.

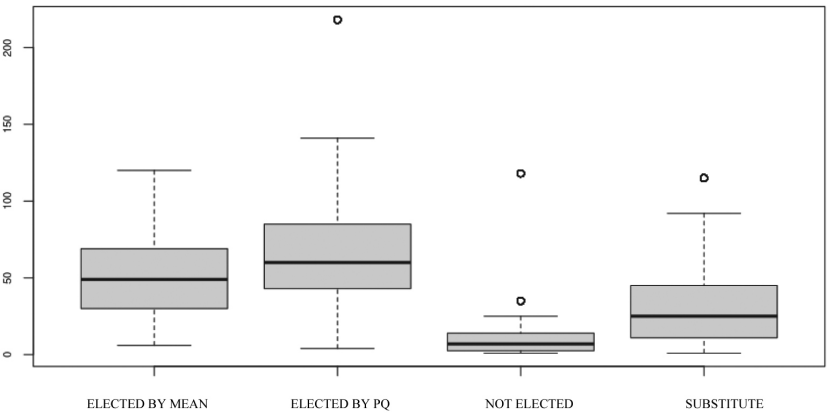
Figure 4
Distribution and value (in log10) of the transactions of candidates for federal deputy in São Paulo



Source: Prepared by the authors based on TSE data.

Figure 5 shows that there is a difference in the spatial distribution of expenditure between the different post-election situations of the candidates. Candidates elected by party quotient made transactions in more cities than those elected by mean who, in turn, made transactions in more municipalities than alternates and the latter more than those not elected.

Figure 5
Distribution of the number of municipalities where candidates have made transactions by post-election situation



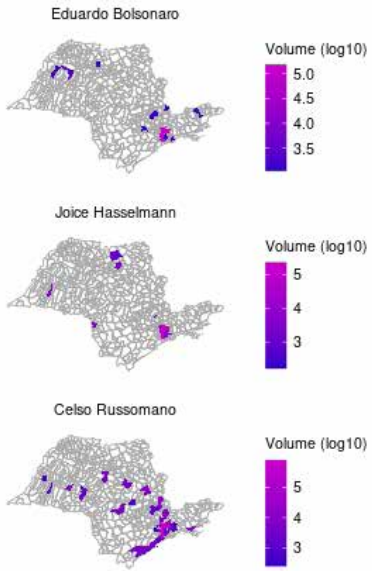
PQ: Party quota.
Source: Prepared by the authors based on TSE data.

Once again, these data suggest a mechanism to be investigated that would explain the relationship between electoral spending and elections: The greater the number of municipalities where there are financial transactions, the more likely a politician is to be elected (a relationship that we have explored in more depth in another article).

Although the relationship between the number of municipalities in which a candidate has spent and their post-election situation is clear, there is a lot of heterogeneity in the regional dispersion of spending between candidates in the same category. We can explore these differences by creating maps based on the municipality's IBGE code.

The maps in Figure 6 show the spatial distribution of the three most voted candidates in 2018 in the state. While Eduardo Bolsonaro (PSL) and Joice Hasselmann (PSL) concentrated their spending in the metropolitan region of São Paulo (RMSP), Celso Russomano (PRB) dispersed his spending more, although it is possible to detect a certain pattern with some concentration on the south coast.

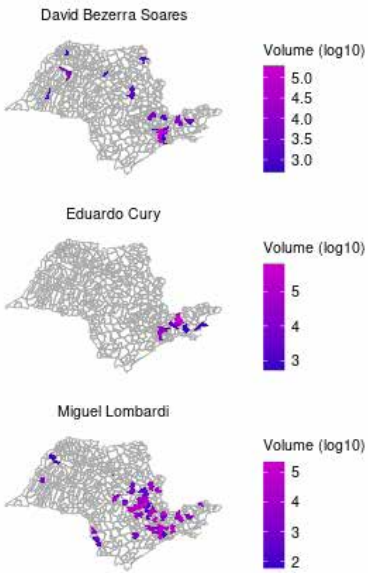
Figure 6
Dispersion of expenses of the three federal deputy candidates elected by the most voted party quotient in São Paulo in 2018



Source: Prepared by the authors based on TSE data.

The same heterogeneity found among those elected by party quotient is found among politicians elected by mean (those who are 'taken' by the vote of the party or coalition). David Bezerra (DEM) concentrated his spending mostly in the RMSP. Eduardo Cury (PSDB) concentrated his spending in the RMSP and part of Vale do Paraíba. Miguel Lombardi (PR) showed greater dispersion, covering the regions of Piracicaba and Campinas. The maps in Figure 7 show these results.

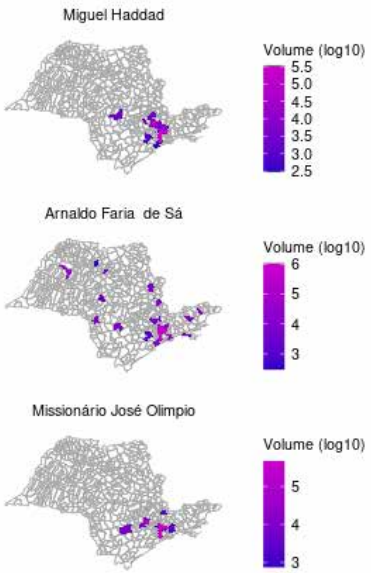
Figure 7
Dispersion of expenses of the three most voted federal deputy candidates by mean in São Paulo in 2018



Source: Prepared by the authors based on TSE data.

The most voted substitute members show a similar spatial distribution of expenses to those elected. The results in Figure 8 show some dispersion, but are more restricted to a certain region. Miguel Haddad (PSDB) concentrated his spending in the northern part of the RMSP. Arnaldo Faria de Sá (PP) concentrated almost all his spending in the municipality of São Paulo, and Missionário José Olímpio (DEM), between the RMSP and the Itapetininga region. These results are evident in the following maps.

Figure 8
Dispersion of expenses of the three most voted substitute federal deputy candidates in São Paulo in 2018

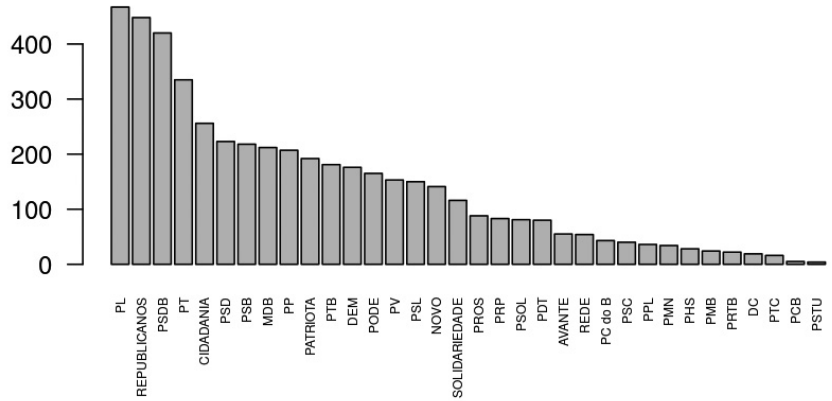


Source: Prepared by the authors based on TSE data.

Spatial Distribution of Transactions by Party

In addition to the dispersion of candidates' spending in São Paulo by electoral status, our database allows to observe the regionalization of candidates' spending by party, as shown in Figure 9. There were 34 parties with candidates in the base, and the movement between them was quite heterogeneous. PL stands out with the highest number of municipalities with transactions (467), followed by REPUBLICANOS (448), PSDB (420), and PT (335).

Figure 9
Distribution of the number of transactions by party

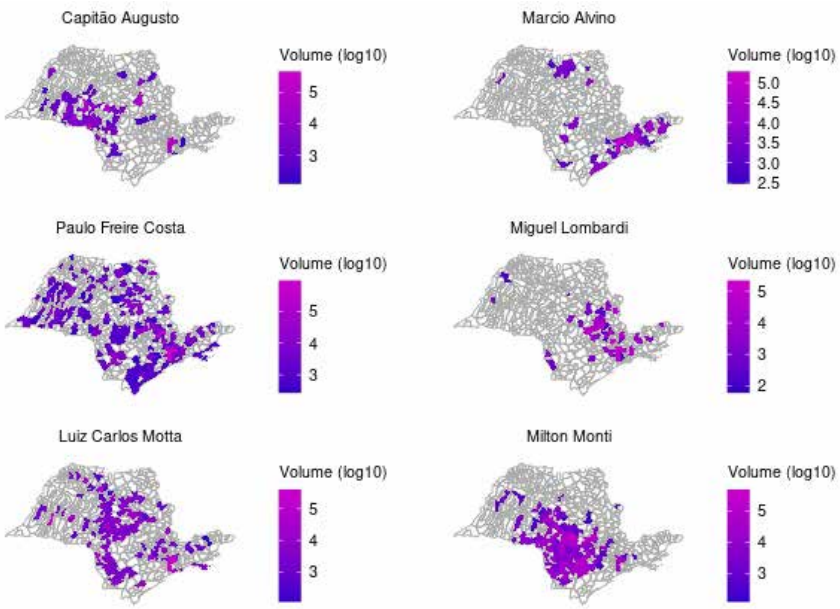


Source: Prepared by the authors based on TSE data.

Comparing the dispersion of spending by elected candidates from the same party, something stands out, which we have explored further in another article: The parties avoid regional overlapping of spending, corroborating the findings of Braga and Amaral on the strategies for assembling candidate lists in São Paulo (Braga, Amaral, 2013). The case of the PR party, whose candidates spent money in the largest number of municipalities, illustrates this situation well.

Figure 10 shows that while the two most voted candidates from this party (Tiririca and Policial Katia Sastre) concentrated their expenses in the capital, Capitão Augusto concentrated his in the Marília and Presidente Prudente regions, Marcio Alvino in Vale do Paraíba and São José do Rio Preto, Miguel Lombardi in the Piracicaba region, and Luiz Carlos Motta in Bauru and Araraquara. The first substitute, Milton Monti, concentrated his expenses in the regions of Itapetininga, Assis, and Bauru. The only elected candidate with expenses throughout São Paulo was Paulo Freire Costa, leader of the Assembly of God Ministry of Belém.

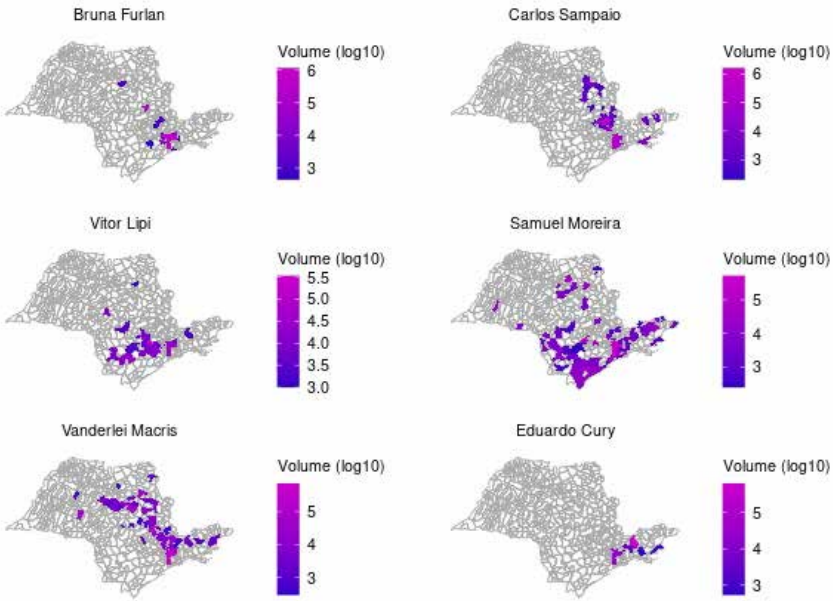
Figure 10
Spread of expenses for five federal deputy candidates elected from the PR party in 2018 and their first substitute



Source: Prepared by the authors based on TSE data.

The PSDB party also avoided overlapping expenses between the candidates who managed to get elected, as shown in Figure 11. Bruna Furlan concentrated her spending in the RMSP, Carlos Sampaio, in the Campinas region, Vitor Lipi, between the RMSP and the Itapetininga region, Samuel Moreira, in Vale do Ribeira and Vale do Paraíba, Vanderlei Macris, in Piracicaba and Araraquara, and Eduardo Cury, in the eastern part of the RMSP.

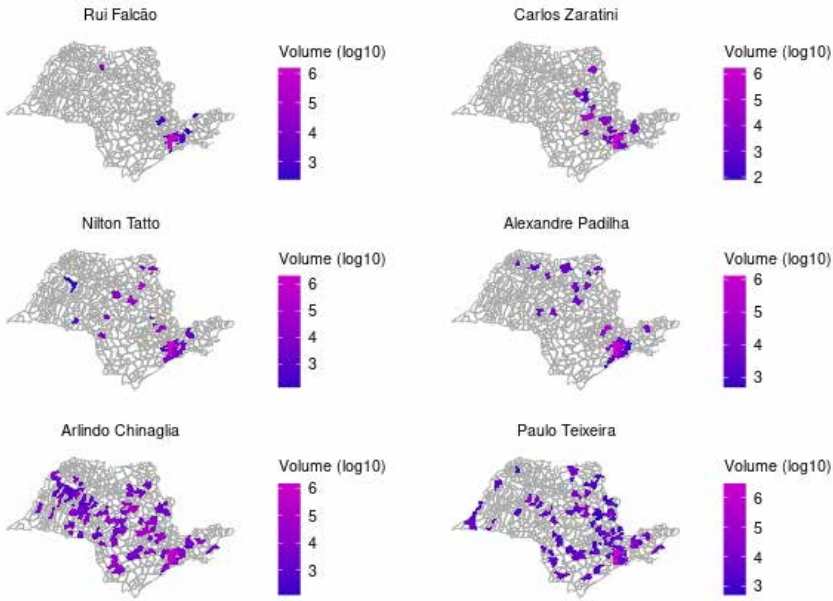
Figure 11
Dispersion of the expenses of six federal deputy candidates elected by PSDB in 2018



Source: Prepared by the authors based on TSE data.

The PT party shows a difference in terms of the dispersion of its spending. Figure 12 shows that of the six deputies elected by the party, Rui Falcão, Alexandre Padilha, Carlos Zaratini, and Nilton Tatto concentrated their spending in the RMSP. The last two had some concentration in the Piracicaba and Araraquara regions, but most of their transactions took place around the capital. Arlindo Chinaglia and Paulo Teixeira, on the other hand, dispersed their spending more widely, with some concentration in the regions of Araçatuba, Marília, and Bauru, in the first case.

Figure 12
Dispersion of the expenses of six federal deputy candidates elected by PT in 2018



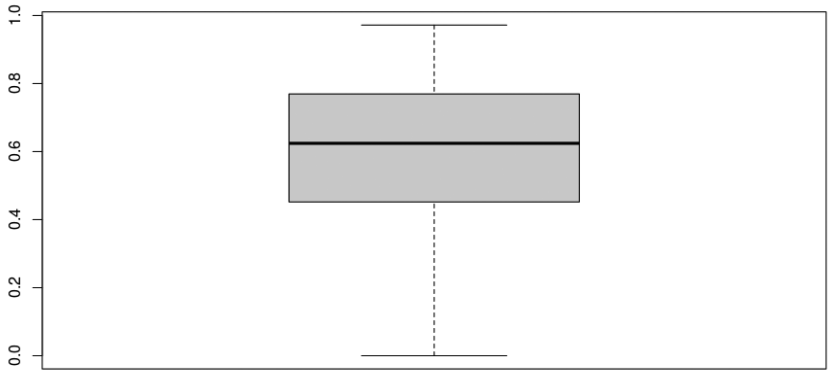
Source: Prepared by the authors based on TSE data.

Relationship between the Distribution of Transactions and Voting

A relevant question is whether there is a correlation between the spatial pattern of distribution of transactions and the vote for a candidate. It has been known since Cox (1968) that the proportion of votes a candidate receives decreases with distance from their base. Johnston *et al.* (2016) argue that candidates receive an inflated number of votes in regions contiguous to their base, the so-called "neighborhood" effect. Following this theory, it would be expected that candidates from São Paulo would receive a greater proportion of their votes in places where they have made transactions.

As our database only shows the votes of the candidates in the municipalities where transactions were identified, we can only compare the total votes in the municipalities where there were transactions with the total votes of the candidate. Figure 13 shows the dispersion of the ratio between these two quantities for all candidates.

Figure 13
Distribution of the ratio of votes in municipalities with identified transactions to the total votes for candidates



Source: Prepared by the authors based on TSE data.

The median is 60% of total spending coming from municipalities where the candidates made transactions. Only 25% of the candidates obtained less than 45% of their votes in these municipalities. There is a clear relationship between concentration of transactions and votes. The literature on the relationship between campaign spending and voting, discussed in the introduction, has always inverted the analysis. Campaign strategy was inferred from the concentration of the vote. If the vote was concentrated, the strategy should be concentrated. Our database allows for the inference to be made in the correct way: given the electoral strategy, the result in votes follows. This enables the examination of an interesting fact: two thirds of the candidates obtained at least 30% of their votes where they did not make transactions. A cross-check with the voting base, using the candidate's number or CPF/CNPJ, would allow us to better explore this finding and countless other issues.

Final remarks

The purpose of this technical note was to present a new database which, by identifying the location of federal deputy candidates' spending, allows for a more precise analysis of campaign strategies. A brief analysis of the case of São Paulo showed some of its possible uses. We showed how to identify campaign strategies, whether individual or party-based; the

effectiveness of spending and its impact on the outcome of the election; and the regionalization of spending and its potential effect on the votes obtained in the different areas of the state.

Research into the impact of campaign strategies on the votes of federal deputies has made progress so far, but has been limited by important gaps, the main one being the difficulty in observing these strategies empirically. The database discussed here allows us to highlight campaign dynamics that shed light on relevant theoretical questions. We hope that, by making this data available, researchers will be encouraged to join in this effort to better understand the dynamics of political competition for the Brazilian legislature.

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