Electoral volatility and short-term clientelism

Three case studies.

H. Rafaela Medeiros

ABSTRACT

In democracies were electoral systems combine elevated magnitude and geographically ample districts, candidates can choose how to allocate their campaign resources across distinct areas and municipalities. In Brazil, it has been argued that parties exert a certain degree of discretion in coordinating their candidates’ geographic position across electoral districts. Nevertheless, federal deputy candidates’ electoral volatility in the country is significant: within districts, approximately 25% of those who self-select to run change more than 33% of their city-level constituency profile between elections. I hypothesized that these changes are related to the usage of a professional brokerage system during campaigns. Albeit not restricted to, but especially important for candidates associated with vote-buying, professional brokers help officials to achieve quickly an impressive number of votes in cities where they were formerly absent. Results from three case studies and smoking-gun test strengthen this theoretical perspective, suggesting that in Brazil a professional brokerage system allows individual candidates to by-pass both partisan and voters’ electoral accountability during elections.
Unlike majoritarian systems where electoral districts are oftentimes circumscribed to small units (thus forcing candidates to build close relationships with the locality they have voted for and to keep them through time), in Brazil 27 electoral districts represent more than 5,570 municipalities. Municipalities in Brazil are considered federative entities, and as such they experience political and administrative independence from both state and federal dominance, with all three levels of administration possessing equivalent legal statuses. Although financial resources and tax collection are considerably centralized at the federal level, municipalities are responsible for several policy services delivered to citizens (Arretche, 1999; Guedes and Gasparini, 2007), and configure undoubtedly an autonomous political entity of great relevance for electoral purposes in Brazil.

Municipalities have their own legislative and executive powers and hold elections regularly every four years (in the mid-term of mandates for president, senators, governors and deputies). It is common for candidates for federal deputy to think about their electoral strongholds more in terms of the municipalities in which their votes are distributed than at the state-level only. It is at the municipal level where electoral brokers and political networks are generally administered (Pessoa Jr., 2011), though governors also play a key role in defining these strategies at the state level (Novaes, 2017). Moreover, when elected, it is also possible for federal deputies to target benefits and resources to specific municipalities, thus strengthening the interest they have in focusing on electoral connections at the local level and providing incentives for an iterative feedback between localities’ and candidates’ reelection interests.¹

Despite that electoral districts are officially defined at the state-level, candidates to Camara dos Deputados can count on votes received throughout the state. Analysis of electoral data across elections has shown that federal deputies’ voting patterns are mainly dispersed, with most candidates receiving votes from a multitude of distinct municipalities (Avelino et al., 2011, 2016). Such contrasts provoked by the electoral strategies of candidates (apparently centered at the city-level), and their dispersion across municipalities within a district, have given rise to a puzzle that is both theoretical and methodological: how to cross-section the analysis of federal deputies’ spatial electoral patterns in order to apply a measure or a proxy associated with their political strategies? And more importantly, how could different strategies entail distinct voting patterns? Both questions are explored in this paper.

Earlier studies have sought to understand the geographical voting patterns exhibited by candidates using the concept of "electoral dominance", measured as the proportion of votes from a single municipality given to a specific candidate (Ames, 1995; Carvalho, 2003). Although these studies have advanced both a rich tradition and valuable contribution to the understanding of Brazilian federal deputies' voting patterns and political strategies, scholarly research in this area has been found to be limited by the analysis of yearly electoral data more generally and encompasses only a restricted set of electoral strategies theoretically defined.

Complexities abound in the relationship between politicians and the municipalities where they gather their voting shares. A candidate can have control over a certain area of influence, for instance, not allowing contenders to establish in their political territories, and use vote buying during elections. But others could exert a similar dominance level over a specific territory and completely establish networks of distinct strategic nature, like a programmatic connection. Candidates can also make use of conditional transfers to attract voters and brokers without the necessary condition of establishing monopolies and strong dominance over localities. In the latter, they could exert dominance or not in a certain city, but they would be inclined to change bailiwicks frequently.

Differences in patterns of political networks have been analyzed by Pessoa Jr. (2011) in the countryside of Ceara. In the central region of the state known as Inhamuns, where drought and vulnerability have drawn impoverished voters with little political autonomy into the hands and halters of traditional hegemonic political families for centuries, Pessoa Jr. (2011) finds contrasting management styles for two state deputies elected during the democratic period. While nominal representatives of these traditional disputes in local politics, each politician adapted to the competition brought by Brazilian democratization on their own: one through establishing stable and strong ties with municipalities and local leaders, the other through inconsistent attachments with his political supporters throughout municipalities. These differences in their strategies were not necessarily captured by the analysis of municipal dominance alone. At any given time politicians displayed similar levels of dominance in the municipalities where they received votes, but they did not neces-

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2This state deputy, Domingos Filho, was elected vice-governor of Ceara in 2010 and was until 2017 a member of Tribunal de Contas Municipal of the state. His son, Domingos Neto, is a federal deputy re-elected in 2018 and one of the three case studies selected for analysis in section 2 of this paper.

3In 1998, for example, both Idemar Cító and Domingos Filho received approximately 40% of the nominial votes for state deputy in the city of Parambu, Ceara (Pessoa Jr., 2011, p.131). However, Idemar Cító had scattered votes across different municipalities of the state and not always consolidated his presence there continuously, while Domingos Filho's vote shares remained concentrated and stable (Pessoa Jr., 2011,
sarily keep the strength of their dominance stable in each municipality over time. From one election to the next, candidates could exert their dominance over a completely different set of cities, changing tremendously the composition of their bailiwicks between elections.

In this paper, I define and present the analysis of electoral volatility in Brazil. My hypothesis is that variation of electoral volatility between candidates and within a candidate’s profile is not completely explainable by alternative theories, especially the demographic concentration of voters and electoral dominance. As explained further, it is conjectured that greater cities could also become more competitive from one election to the next, and thus candidates should experience greater volatility in the municipalities that concentrate more voters within districts. On the other hand, electoral dominance could cause volatility, as disperse types of candidates would be expected to employ more programmatic strategies and be exposed to more variation in the electorates’ preferences. Analyses of electoral volatility for candidates to federal deputy in Brazil show that neither of these alternative explanations exclusively explain the phenomenon – thus suggesting that the hypothesis that volatility is caused by short-term clientelism could be valid. Furthermore, I develop three case studies and show detailed evidence that, in the case of candidates accused of vote buying with inconsistent bailiwicks, increases in vote share between elections are associated with precinct concentration as hypothesized by short-term clientelism theory. Thus, the paper contributes to the literature by defining and analyzing an innovative electoral measure - candidates’ volatility over time - and by investigating the connections between bailiwicks inconsistency and political strategies of candidates running for federal deputy office in Brazil.

The text is structured as follows: in the next section, I provide reasoning for why electoral volatility matters and explain the measurement strategy used in the study. Later in the section I also show that variation depicted by Brazilian candidates’ electoral volatility is not completely explained by current theories, and that it could be used to capture an important feature of political strategies. Further section 3 shows that, for three re-elected federal deputies with high electoral volatility and associated with clientelism, implications of short-term clientelism theory are applicable. Finally, Section 4 concludes with the implications of this study.

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\(^4\)In this text, I am using municipalities and cities as synonymously.
0.1 Electoral volatility

While the relationships between geographic voting patterns and electoral strategies can be conceptually derived, unless we can observe these relationships, they remain non-testable principles. In order to overcome such difficulties, I have developed a strategy for understanding how different electoral strategies and political networks are expected to behave in time: the consistency of voting shares' spatial distribution that candidates experience over successive elections. This variable was designated electoral volatility.

Volatility is a measure commonly used in business and finance literature that aims to account for discrepancies over time in a certain variable, most often, stock prices (Rabemananjara and Zakoian, 1993; Engle and Victor, 1993; Wang, 1993). Furthermore, Wang (1993)'s model has pointed out that the volatility of stock prices is increased by asymmetries of information. In the application of the concept to electoral politics we can say that volatility is an ex-post measure of either uncertainties or anticipated change of bailiwicks. Uncertainty in a candidate's political strategy can arise in several forms. When delegating the task of eliciting voters' preferences to other organizations and agents during elections, for instance, candidates can only imperfectly observe how these agents are performing. Until voting booths are opened, candidates cannot be certain if their decisions about intermediaries, agreements, campaign targeting, and spending have been successful – thus the uncertainty of how their voting shares across cities will develop. Aware of these uncertainties, candidates aim to compensate for it. They can strengthen their connection with certain cities, fixating presence through closely associated intermediaries. This is the more commonly thought of strategy. However, I have argued that candidates can also opt to form unstable connections with their networks, if they find a set of intermediaries able to be hired during elections.

As used here, electoral volatility is a measure of candidates' vote share stability in space over time, proposed to be related with political strategies employed by candidates during elections. It measures directly how much the voting patterns for a single candidate within a district varied across municipalities in successive elections. Assuming, for instance, that most candidates structure their political networks at the city level, this measurement strategy reveals how successful they are in keeping these networks stable.

Volatility in the context of elections can be defined as the absolute difference
in the proportion of votes a candidate receives between successive elections. It is calculated as follows: the number of votes candidate \( i \) received in each municipality was divided by the amount of votes candidate \( i \) received in total in the electoral district at time \( t = 0 \), thus giving us the proportions of her voting shares per city. As in the equation below:

\[
P_{ijt} = \frac{V_{ijt}}{\sum_{j=1}^{J} V_{ijt}}
\]

Similarly, the same proportion was calculated for the immediate subsequent election for all candidates \( (t = 1) \). Later, candidates who contested for subsequent elections were matched and for each municipality where the candidate received votes (either at \( t_0 \) or \( t_1 \)), I subtracted the proportion of votes received in the municipality, \( j \), in \( t = 1 \) from the amount received in the same municipality at \( t = 0 \), thus compounding the relative difference of vote share distribution between elections. In the case of a within-individual analysis, volatility is thus defined as:

\[
Volatility_{ij1} = |P_{ij1} - P_{ij0}|
\]

In this equation, \( t = 0 \) is our baseline year whereas \( t = 1 \) is the subsequent election. Further, in order to analyze patterns of consistency between candidates, I have aggregated the values for each candidate \( i \) by summing up the absolute values of their municipal volatility, diminishing volatility in \( t = 0 \) from municipal volatility in \( t = 1 \), and dividing that result by two. The equation below summarizes this process:

\[
Volatility_{i1} = \frac{\sum |P_{ij1} - P_{ij0}|}{2}
\]

In short, it is the average absolute municipal level vote swing for any candidate between elections.

\[5\] I am grateful for Prof. Cesar Zucco Jr. for having pointed to this measure. It is an adaptation of the Pedersen Index that, instead of providing volatility measured at the party system level, focuses on measuring candidate-specific volatility in time.
0.2 Electoral Volatility in Brazil (2002-2018)

Though the number of municipalities in which candidates were elected did not present much variation over time, the number of effective municipalities\(^6\) in which *elected* candidates receive votes in Brazil is apparently increasing. In 1998, a candidate elected federal deputy from Pará would, on average, collect votes in effectively 15 cities from the state’s 144 total. In 2018, the number of effective municipalities a candidate elected to Camara dos Deputados received grew on average to 21 in that same state. In Bahia, this number went from almost 18 up to 28 in the same period, an increase of more than 55%. And in Minas Gerais an elected candidate had an average of 16 municipalities effectively casting ballots for her in 1998, a number that expanded to more than double two decades later.

Despite this, the number of effective candidates per municipality in Brazil can be viewed as considerably low. Table 1 below depicts the effective number of candidates who ran for federal deputy office in 2018, calculated at both the state and municipal levels.\(^7\) It also reports the number of municipalities in each state, the median number of effective candidates when calculated at the city level and the median volatility for individuals running for office per state in 2018. We can see from the data shown that while the number of candidates per state are quite elevated, the number of competitors for federal deputy at the city level is considerably lower. In Bahia, for instance, while almost 65 candidates were found to be competitive at the state level, in 50% of its cities less than seven candidates effectively competed for federal deputy in the 2018 Brazilian elections.

Partially, these differences between variables per state appear to be explained by the different number of municipalities a state has. In Roraima, the state with the smallest number of cities in Brazil, approximately 36 candidates are found competitive at the state level, and in at least 50% of the cities there the number is above 16 approximately. It also appears from Table 1 that the electoral volatility of the median candidate likewise correlates with the number of municipalities in the state.

\(^6\)I calculated the number of effective municipalities per candidate using Laakso and Tagepera’s formula, where the proportion of votes received by each candidate in each municipality was squared and aggregated at the candidate level.

\(^7\)I also used the Laakson and Tagepera Formula and aggregated it at distinct levels. In the case of the state, the proportion used was the total number of votes a candidate received in the state divided by the total number of nominal votes for federal deputy office in that state. In the case of municipalities, the proportions were the number of votes received by the candidate at that city level divided by the municipality totals of nominal votes. The median number of effective candidates per municipality in each state is the final value represented in Table 1.
### Table 1: Number of Cities, Number Effective Candidates per State and Cities and Electoral Volatility of Candidates in Brazil - Absolute and Median Values

**Federal Deputies 2018**

<table>
<thead>
<tr>
<th>State</th>
<th>Cities</th>
<th>Mag.</th>
<th>Neff.state</th>
<th>Median Neff.city</th>
<th>Median Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>102</td>
<td>09</td>
<td>15.51</td>
<td>5.44</td>
<td>22 p.p.</td>
</tr>
<tr>
<td>AP</td>
<td>16</td>
<td>08</td>
<td>34.77</td>
<td>17.11</td>
<td>15 p.p.</td>
</tr>
<tr>
<td>BA</td>
<td>417</td>
<td>39</td>
<td>64.56</td>
<td>7.20</td>
<td>40 p.p.</td>
</tr>
<tr>
<td>CE</td>
<td>184</td>
<td>22</td>
<td>38.90</td>
<td>7.60</td>
<td>34 p.p.</td>
</tr>
<tr>
<td>MT</td>
<td>141</td>
<td>08</td>
<td>28.51</td>
<td>8.79</td>
<td>37 p.p.</td>
</tr>
<tr>
<td>PA</td>
<td>144</td>
<td>17</td>
<td>34.93</td>
<td>10.25</td>
<td>29 p.p.</td>
</tr>
<tr>
<td>PB</td>
<td>223</td>
<td>12</td>
<td>27.26</td>
<td>5.43</td>
<td>38 p.p.</td>
</tr>
<tr>
<td>PE</td>
<td>185</td>
<td>25</td>
<td>32.18</td>
<td>6.73</td>
<td>33 p.p.</td>
</tr>
<tr>
<td>PR</td>
<td>399</td>
<td>30</td>
<td>58.16</td>
<td>10.05</td>
<td>26 p.p.</td>
</tr>
<tr>
<td>RJ</td>
<td>92</td>
<td>46</td>
<td>87.02</td>
<td>27.06</td>
<td>22 p.p.</td>
</tr>
<tr>
<td>RN</td>
<td>167</td>
<td>08</td>
<td>23.35</td>
<td>6.73</td>
<td>37 p.p.</td>
</tr>
<tr>
<td>RR</td>
<td>15</td>
<td>08</td>
<td>35.71</td>
<td>15.73</td>
<td>12 p.p.</td>
</tr>
<tr>
<td>SC</td>
<td>295</td>
<td>16</td>
<td>52.82</td>
<td>10.00</td>
<td>26 p.p.</td>
</tr>
<tr>
<td>SP</td>
<td>645</td>
<td>70</td>
<td>57.96</td>
<td>17.74</td>
<td>25 p.p.</td>
</tr>
<tr>
<td>TO</td>
<td>139</td>
<td>08</td>
<td>17.70</td>
<td>5.70</td>
<td>41 p.p.</td>
</tr>
</tbody>
</table>

| N     | 5569   | 505  | *7458*     | *7458*           | 946               |

*Source: Electoral Data 2018 - TSE/Brazil.*

*Note: *Total number of candidates.*
As we can see from Table 1, the number of municipalities varies considerably per state: ranging from only 15 in Roraima to 853 in Minas Gerais. A similarly broad variation can be found when we observe the effective number of candidates at the state level: from approximately 15 in Alagoas to 122 in Minas in the 2018 elections. It calls to attention that Amapá and Roraima, despite having only 16 and 15 municipalities respectively, had an elevated number of effective candidates in 2018, approximately 35 and 36 respectively. These number of effective candidates are comparable to states with many more municipalities, such as Pará, Ceará and Maranhão.

Although the number of effective candidates varies in interesting ways across states when calculated at the state level, when this number is calculated at the city level we find that the number of effective candidates competing in each municipality is greatly reduced. As we can see from Table 1, in only seven states did 50% of the municipalities have more than 11 candidates effectively competing at the local level. And in the Northeast states of Brazil (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piaui, Rio Grande do Norte and Sergipe) the number of effective candidates competing at the municipal level in 50% of the cities was less than 8. This happens despite the fact that electoral magnitude in Bahia is 39, a number comparable to Rio de Janeiro’s 46 elected deputies in which 27 or more candidates have been found to compete in 50% of the states’ 92 municipalities.

Additionally, in states with the least number of cities (Amapá and Roraima), the median electoral volatility of candidates was lower. In theory, when one state has more cities than another, candidates should find greater room to strategic targeting sections of the districts’ electorate. However, above a certain threshold it was hard to determine the volatility of candidates by looking at the number of cities alone. Other processes seem to be elevating or diminishing candidates’ volatility through states and years. For instance, in Piauí, the median electoral volatility of candidates to federal deputy was 38 p.p. while in Rio Grande do Sul it was 25 p.p. - despite that Piauí has less than half of the municipalities of Rio Grande do Sul (144 against 497 respectively). Nevertheless, it is possible that within states the actual size of cities impacts electoral volatility. Figure 1 below provides evidence to strengthen this interpretation, showing the distribution of electoral volatility per candidate in all Brazilian states across years.

Minas Gerais is the Brazilian state with the greatest number of municipalities. However, candidates to federal deputy from this state did not expressed an expressive increase in electoral volatility when compared to those that competed in the states of Bahia, Ceará, Maranhão and Pernambuco on average - despite the
**Figure 1:** Candidates’ Electoral Volatility in Brazil per State (2002-2018)

fact that these states have only half (Bahia) or approximately a quarter of the number of municipalities in Minas. On the other hand, candidates from São Paulo, a state with more than 600 cities, had on average similar electoral volatility levels to Rio de Janeiro, Sergipe and Espírito Santos - states with 92, 75 and 78 municipalities respectively in 2018. The evidence provided here also suggests that the electoral volatility of candidates in Amapá and Roraima - states with 15 and 16 municipalities - was affected by the number of cities, as the candidates from these states can be found expressing an electoral volatility of lower magnitude across years on average. It is reasonable to infer that when the number of municipalities is quite small (less than 20, for instance), it imposes restrictions to the strategic considerations of candidates. As the number grows the relationship between number of cities in each state and the median or average electoral volatility expressed by candidates becomes less straightforward.

However, cities’ sizes (in terms of their proportion of state electorates, for instance) particularly could impact significantly the electoral volatility of candidates. As we have seen in the section above, electoral volatility is calculated from the proportion of votes a candidate receives in two successive elections, and thus might be subject to the number of votes cities’ concentrate in general. It is reasonable to infer that more populated cities are the ones candidates would be tempted to focus on during elections, as the probability of capturing any voter there would be greater when compared to smaller municipalities in the state.

Thus, while candidates could achieve more significant returns at elections focusing on big cities, they would also become more competitive pools of voters. By means of greater competition in municipalities that concentrate greater proportions of the district’s electorate, we should expect that candidates display more inconsistent ties with voters that live in these cities between elections, when compared to the smaller municipalities where their voters reside. Therefore, the greater number of voters a city concentrates when compared to the states’ total, the more likely it would be in attracting new competitors – and less likely a candidate running successively would be to keep their number of past vote shares equal.

In order to understand the relationship between electoral volatility, its component parts and municipalities’ concentrations of votes, I have run different regression models. Concentration of votes was measured as the sum of nominal votes to federal deputy in each municipality. Notice that although I have defined electoral volatility at the candidate level in the former section, it is a measurement strategy also applicable at the candidate-city level. Because the relationship conjectured be-
between cities’ size and candidates’ spatial inconsistency occurs within a candidate’s electoral profile, I have performed an analysis focused on the latter here. I use different models, with and without fixed effects for candidates and year, in a data set of more than 820 thousand observations. Each observation represents a single individual’s vote share and electoral volatility per municipality and year.8 Results are presented in Table 2 below.

Table 2: Linear Regression and Fixed Effects Model - Candidate’s Vote Shares and Electoral Volatility per City.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Vote Shares - t0</th>
<th>Vote Shares - t1</th>
<th>Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Municipal Concentration of Votes* - t0</td>
<td>0.891***</td>
<td>0.802***</td>
<td>0.003***</td>
</tr>
<tr>
<td>(0.001)</td>
<td>(0.002)</td>
<td>(0.00001)</td>
<td></td>
</tr>
<tr>
<td>Municipal Concentration of Votes* - t1</td>
<td>0.888***</td>
<td>0.787***</td>
<td>0.003***</td>
</tr>
<tr>
<td>(0.001)</td>
<td>(0.002)</td>
<td>(0.00001)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-1.981***</td>
<td>-1.907***</td>
<td>0.021***</td>
</tr>
<tr>
<td>(0.010)</td>
<td>(0.010)</td>
<td>(0.0001)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>822,174</td>
<td>822,174</td>
<td>820,711</td>
</tr>
<tr>
<td>R²</td>
<td>0.312</td>
<td>0.443</td>
<td>0.441</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.312</td>
<td>0.443</td>
<td>0.441</td>
</tr>
<tr>
<td>Residual Std. Error</td>
<td>1.784 (df = 822172)</td>
<td>1.608 (df = 819328)</td>
<td>1.778 (df = 820709)</td>
</tr>
<tr>
<td>F Statistic</td>
<td>373,121.800 (df = 1; 822172)</td>
<td>372,431.500 (df = 1; 820709)</td>
<td>63,355.130 (df = 1; 820709)</td>
</tr>
</tbody>
</table>

Results depicted in Table 2 discourage the hypothesis that a greater concentration of voters explained variation in electoral volatility within candidates’ profiles, as this relationship is not strongly supported by evidence. Even in the fixed effects model, in which all individuals and year characteristics were fixed, correlation between volatility and cities’ size is negligible. Although the effect of cities’ size is significant, positive and strong when the dependent variable is the component parts of volatility (Models 1 to 4), in the models in which electoral volatility was analyzed (Models 5 and 6), coefficients became significantly weaker and the models explained only a small percentage of variation in the dependent variable. Thus, we can affirm that while individuals’ vote shares per city were strongly affected by the proportion of votes each city concentrated, the reasons they maintain or change it over time are hardly explained by this factor.

Consider for instance analysis of our fixed effects model coefficients. For elections at time $t = 0$, for any 10% increase in a city’s concentration of votes the expected ratio of a candidate’s vote share between cities will be 8.0% ($R^2 = 0.44$). This effect is robust to the following elections ($t_1$) for individuals in our data set, where we expect about a 7.8% increase in candidates’ vote shares when concentra-

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8As defined by Equation 2.
tion at the municipality increases by 10% ($R^2 = 0.44$), controlling for all candidates and year characteristics. Conversely, when electoral volatility is our dependent variable, for any 10% increase in a municipality’s concentration of votes the difference in the expected electoral volatility within a candidate’s profile will be approximately of 0.0003 ($R^2 = 0.11$) on average.

Despite that volatility at the individual level per city in each year is calculated from percentage vote shares, and that these components are themselves strongly correlated with municipalities’ concentrations of votes in the state, results depicted in Table 2 are surprising. Cities’ concentrations of votes can hardly explain more than 10% of the variance in electoral volatility found within candidates, even when controlling for year and individual candidates’ fixed effects.

Moreover, when aggregated at the individual level, if the relationship of electoral volatility was strongly associated with demographic variables, we should observe little variation between candidates in Brazil. As the size and concentration of inhabitants within cities in a state changes only partially between years, stable patterns should be observed in general. Figure 2 provides an insight into this variation, showing the histogram of candidates’ electoral volatility in our data set of 4,180 individuals that have run successively in at least two of all six Brazilian elections between 1998 and 2018.

As we can see from Figure 2, hypothesized small variance between candi-
Candidate volatility is great between candidates for federal deputy office in the country, which can be a reflection of the underlying variation in their political strategies hypothesized earlier. Evidence supports us a step further into arguing that electoral volatility could be an important window of opportunity to observe candidates’ electoral strategies in Brazil. However, an alternative explanation that weakens this hypothesis is that the variation between candidates might be elevated exclusively for those who are not successful in getting elected. If a candidate self-selects to run, and if she can choose her local electorate and anticipate in which municipalities she is more likely to get votes, then electoral volatility variance observed above could be driven by a specific group of individuals who are less successful in this strategic anticipation. Candidates that make mistakes would be less likely to achieve their expected results, and thus more likely to display greater electoral volatility. Following this reasoning, we should expect both a greater variance and a more elevated average in the electoral volatility of candidates in the group of non-elected when compared to those elected across years. Figure 3 plots the distribution of electoral volatility per group across years.

From Figure 3 we can show partial support for the hypothesis presented above. Although the group of non-elected candidates for federal deputy office in

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9 Additionally, comparison between variation across different bootstrapped samples further strengthened this assumption.
Brazil displays more dispersed patterns of electoral volatility when compared to those elected, these differences between groups are not significant. Moreover, in neither one of the five elections for which electoral volatility was calculated, was the average of electoral volatility in the group of non-elected candidates greater than the average in the other group. When different, it was the elected candidates that displayed greater electoral volatility, which happened in three of all five elections analyzed in Brazil (2002, 2006 and 2018). Therefore, we can say that while some of the variance in electoral volatility is correlated with the success of candidates, a significant part of variation is left unexplained.

0.3 Volatility and dominance in electoral patterns

Theories based on analysis of electoral dominance in Brazil render an alternative explanation for electoral volatility variation found for candidates in the country. If dominance is supposed to be correlated with the usage of traditional clientelism and/or pork barrel as hypothesized (Carvalho, 2003; Ames, 2016), we should expect that volatility of candidates is greater when their average dominance per municipality is lower. Political strategies such as traditional clientelism and pork should be captured by elevated dominance of candidates in cities, thus causing only those with more dispersed voting patterns (for instance, those not clientelistic) to display more inconsistent electoral bailiwicks. Following these implications, more dominant candidates should be more likely to keep their territories stable over time. Thus, according to previous theories, volatility and dominance should be inversely correlated.

I tested this implication of the debate about electoral dominance in the models presented in Table 3. For all federal deputy candidates in our electoral volatility data set of Brazilian elections, I calculated the dominance displayed at the municipal level and included the average of their dominance in our data set. As we have seen, state characteristics might bias our sample variations and thus I have run different linear regression models with and without state and year fixed effects. I also included a dichotomous variable for the status of success for each candidate.

Results show that dominance and electoral volatility are correlated. However, this relationship is in opposition to what most theorists would anticipate. The relationship found in this rather simplistic model is that the more concentrated the average the electoral dominance of a candidate within a given city, the more inconsistent are her bailiwicks on average. Positiveness of coefficient sign is robust across
Table 3: Linear Regression with Fixed Effects Models - Volatility and Average Dominance

<table>
<thead>
<tr>
<th></th>
<th>OLS</th>
<th>felm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Average Dominance</td>
<td>0.100</td>
<td>0.270**</td>
</tr>
<tr>
<td></td>
<td>(0.091)</td>
<td>(0.111)</td>
</tr>
<tr>
<td>Non-elected</td>
<td>0.016***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.289***</td>
<td>0.275***</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>4,210</td>
<td>4,210</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.0003</td>
<td>0.002</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.00004</td>
<td>0.002</td>
</tr>
<tr>
<td>Residual Std. Error</td>
<td>0.131 (df = 4208)</td>
<td>0.150 (df = 4207)</td>
</tr>
<tr>
<td>F Statistic</td>
<td>1.187 (df = 1; 4208)</td>
<td>4.187** (df = 2; 4207)</td>
</tr>
</tbody>
</table>

*Source: Brazilian Electoral Data - TSE (1998-2018)*

* p < 0.1; ** p < 0.05; *** p < 0.01

models. As we include control variables and add fixed effects to our models, the relationship of average dominance with total electoral volatility of candidates becomes stronger. When controlling for state and year fixed effects (Models 3 and 4), one percentage point increase in the average dominance of candidates leads to a 26 percentage point increase in volatility ($R^2 = 0.17$) on average, when electoral success is not controlled for. In the model in which we include this control variable, the effect of one percentage point increase in dominance goes up to an 81 percentage point increase in electoral volatility on average ($R^2 = 0.18$).

Though preliminary, these findings diminish the centrality of alternative explanations for electoral volatility in Brazil. Claims that volatility would be driven by candidates with dispersed voting patterns exclusively are not supported by the results of our models. Although a significant proportion of the dependent variable is explained by the models presented, the greater the average of a candidate’s dominance across municipalities, the higher her electoral volatility is in general. This result is left unexplained by current theories of spatial voting patterns and electoral strategies in Brazil. However, if we consider that electoral volatility is a proxy for asymmetries of information, it could be interpreted as a sign that, sometimes, dominant politicians might not keep their bailiwicks stable - a contradiction that is proposed to be explained by short term clientelism theory (Medeiros, 2013).
In this section, I have reviewed the measure of electoral volatility in detail and analyzed different aspects of it for federal deputy candidates throughout five Brazilian elections. A previous assumption made in this paper is that electoral volatility in Brazil is correlated with electoral strategies more generally and with short-term clientelism more particularly. This assumption so far holds. It was particularly strengthened by the demonstration that candidates’ volatility patterns were not completely explained by demographic variables or other political variables, such as electoral success and candidates’ electoral dominance.

0.4 Volatility and Short-term Clientelism.

Following my previous theoretical work (Medeiros, 2013), I conjectured that a particular type of political strategy is expected to present highly distinct patterns of vote shares’ spatial distribution with time, due to the inherent informational asymmetries that arise between candidates, brokers and voters. Denominated “short-term clientelism”, this strategy is thought to rely on structured networks of vote buying focused on electoral periods exclusively, which can be articulated across many different municipalities between elections, while sustaining partial efficiency.

Though we cannot assume that when candidates’ spatial distributions are kept the same their networks are similarly structured within any given city, when they actively change their spatial distribution of votes significantly from one election to the next we can securely infer that the set of brokers and voters articulated in their political networks at the local level have changed. But how can we support the argument that volatility is associated with short-term clientelism?

In this section I offer an answer to this question. I have selected three case studies where federal deputies re-elected to office in 2018 were found to be associated with clientelism while displaying elevated electoral instability, as measured by volatility. It is conjectured that in the case of these candidates, short-term clientelism theory could explain why they change their voting patterns so much across elections. I have designed a smoking-gun test in order to test the hypothesis that, for the candidates selected, increased vote shares between elections would be associated with greater vote concentration at the precinct level, as brokers usually are monitored by politicians in the aggregate at the precinct level. First, I describe in more detail the case selection and methods used.
0.4.1 Methods: Case studies and a smoking-gun test

Smoking-gun tests are process-tracing techniques used by qualitative studies in the social sciences in order to strengthen qualitative research design and inference (Amorim Neto and Rodriguez, 2016). They focus on providing a sufficiency test for theories, establishing singular pieces of evidence that necessarily sprung from a particular hypothetical argument. When confirmed, evidence tend to give the researcher a moderate level of confidence in the hypothesis preliminarily established, thus strengthening theories developed to explain a phenomenon.

I started by selecting three politicians from a group, following a cross-section classification of the dependent and independent variables, choosing Brazilian re-election candidates for federal deputy with elevated volatility for whom previous qualitative evidence or legal proceedings indicated the use of clientelism and vote buying. Mainly, the hypothesis that volatility is associated with vote buying was tested analyzing the variation of concentration per precinct compared between the cities where the candidates in our case study most greatly increased their vote shares in 2018.

If vote buying works because a system of alliances keeps brokers loyal in the short-term, it is hypothesized that it does so necessarily because it is possible for politicians and candidates to perform a post-election check of brokers performance analyzing their vote shares received at the precinct level. Thus, there should be a tendency for clientelist candidates with high volatility to increase more their voting shares (from one election to the next) where they concentrate the most of their votes at the precinct level, if these votes are gained through vote buying. Additionally, a comparison was also designed to assess distinct concentration per precinct patterns and trends depicted by one of our case studies and a programmatic elected candidate for the state of Minas Gerais in order to assess an alternative hypothesis for this variable trends. The following section describes the methods used to select the case studies analyzed and provides a detailed account of each test performed.

In order to investigate both questions, in this paper I analyzed three case studies of candidates for federal deputy in Brazil’s 2018 elections\textsuperscript{10} associated with clientelism and vote buying from different states in the country.\textsuperscript{11} Each one of them

\textsuperscript{10}For feasibility reasons I have considered the analysis for the year of 2018 only. However, in the future it is my intention to extend this analysis to include more candidates and/or years in the study design.

\textsuperscript{11}Politicians chosen were: Domingos Neto (currently from Partido Social Democrático (PSD) in Ceará), André Fufuca (from Progressistas (PP) in Maranhão) and Zé Silva (from Solidariedade party in Minas Gerais). All three ran in the 2010, 2014 and 2018 elections, though for distinct offices and their volatility...
was chosen based on previously determined information about their use of clientelist strategies, pre-selected from a list of highly probable cases for their re-election status and differing degrees of volatility. After selecting candidates, for each one of them the same method of analysis was used. Additionally, in one case I also selected a programmatic candidate elected to Brazil’s Camara dos Deputados in 2018 from the same state and applied a similar analysis, thus performing significant comparisons between two different types of candidates and their voting patterns.

Case Selection

Candidates were pre-selected from a list of likely clientelist candidates with elevated volatility levels for 2018. I analyzed where each candidate’s volatility levels were positioned in terms of the distribution of volatility per candidate in 2018, thus providing evidence for their highly inconsistent electoral basis. For each candidate in this group, I later collected preliminary evidence to support their association with clientelism. From this list, I selected three cases to study in more detail, described the candidates’ biographies and provided short descriptions of their political careers.

Two of the three candidates selected - André Fufuca and Zé Silva - were formerly officially accused and investigated for vote buying. Domingos Neto is part of a traditional family of politicians in Ceará, which clientelist political practices have been formerly documented. Although previous studies have documented the use of clientelism by his father’s electoral strategies, context-specific transformations of politics within the state explored in the case study below may have offered the conditions for Domingos Neto’s use of short-term clientelism in the 2018 elections. All three case studies selected displayed high electoral volatility in 2018, greater than the 33 p.p. threshold established in the section above and situated above the 85% percentile of the distribution of electoral vitality for all candidates in 2018.

Although the existence of politicians with inconsistent basis and clientelist practices might seem a puzzle for current literature on the topic, the phenomenon has increased significantly in 2018 when compared to the former year. Quantitative analysis of their voting patterns in this section is focused on 2018, while information from previous elections were also drawn when necessary. Qualitative information was documented focusing on their biographies from web tools research, newspaper mentions, political blogs and institutional or local news media. In the case of Domingos Neto, because of the familiarity of the author with case studies of local politics in Ceará, previous qualitative research findings were also extensively used.

12The threshold for electoral volatility used follows a bootstrapped hierarchical sampling method that aimed to detect what would be expected level of volatility on average for Brazilian candidates. Following this approach, the cutoff of high volatility was established as above 33 p.p.
is explained by my theory of short-term clientelism. It is implied that their clientelist strategies should be displayed in a form more compatible with inconsistent electoral basis, and thus more according to short-term clientelism theory. Therefore, that these three candidates studied were at least moderately inclined to practice clientelism (as the qualitative evidence gathered suggests), it was at odds with current theories. This explains why the analysis of their electoral patterns is of great importance to this study. In the section below, I describe the design of the test used to analyze the implications of short-term clientelism theory to these case studies.

**Smoking-gun hypothesis test**

In order to test my theoretical implications, I have designed a smoking-gun test composed of three sufficient hypotheses that provided evidence for the theoretical arguments of short-term clientelism structured thus far. However, restrictions imposed by the selection criteria limited the application of the third test to all case studies. Therefore, while the first two tests involved were performed for each one of the three cases studied, the third was a comparison between distinct politicians’ patterns limited to only one case. As Amorim Neto and Rodriguez (2016) argue:

> [t]he smoking gun test sets out the sufficient but not necessary conditions for the validation of a particular hypothesis. Passing the test means that the hypothesis has been confirmed; however, failure does not imply elimination. When the main hypothesis passes the smoking gun test, rival hypotheses weaken to a good measure. (Amorim Neto and Rodriguez, 2016, p.1011).

In the first test, the hypothesis that volatility could be mostly driven by candidates’ expansion of vote shares in the same municipalities is analyzed. For each candidate, I show a table with the composition of the first ten cities where they increase their voting shares the most in the 2018 elections and describe some changes of particular interest.

In the second test, I gathered a different data set and performed an analysis of vote concentration for each candidate at the precinct level. If volatility is associated with clientelism, when candidates increase their voting shares more significantly in a city, they do so at a more elevated concentration ratio per precinct than in other municipalities, as it is at the precinct level that the performance of the brokers hired to work for them in the short-term is subject to monitoring. I then show the precinct concentration distributions for each candidate at different percentage thresholds of vote share increase between elections and provide evidence that this argument is sustainable.
Cutoff points were defined using an algorithm to identify and select the municipalities in which the candidate increased their percentage of votes more between 2014 and 2018. I later created five dichotomous variables in the data set of precinct votes per candidate identifying whether that precinct was located in the group of municipalities in which the candidate most greatly increased his votes. The first variable selected all municipalities in the upper 25% vote share increase, the second those at the 15% and the third, fourth and fifth at the 10%, 5% and 1% respectively. It is expected that the more restrictive the cutoff point, the higher the concentration per precinct in the group of cities in which the candidate most greatly increased his votes should be when compared to the precincts located in other municipalities. Through this analysis we can show that the candidates gain their votes in cities where precinct concentration is higher when compared to the cities in which his votes are not increased – further suggesting this might be happening through the use of vote buying. Additionally, this analysis was replicated excluding the municipalities (and precincts) where the candidate and the mayor were from the same party in order to show whether differences in precinct aggregation were leveraged by partisan linkages.

In the third test, I compared the precinct aggregation patterns for one of the cases studied in this section with the patterns displayed by a programmatic candidate. If precinct concentration is an indication of brokerage coordination (and supervision) of their vote buyers’ networks rather than a consequence of the brokerage articulation at the local level, opposite patterns are expected to arise between candidates in this comparison. While the vote buyer would tend to concentrate more votes in the precincts in those municipalities in which his vote shares increased the most, the programmatic politician would tend to display higher a concentration per precinct in the municipalities where her voting shares are more stable. If it is a consequence of the alternative hypothesis that candidates are in general inclined to enter in political markets localized where they already have a previous strong articulation, despite their differences, both candidates should display similar concentrations per precinct levels by groups. Results and descriptions for the cases and their respective test are presented in the following section.

0.4.2 Domingos Neto: family tradition and the two clientelisms

Domingos Neto is a young federal deputy re-elected in 2018 by the state of Ceará, one for whom the family has a long history of political leadership in the central region of the state known as the Inhamuns. Dominance of the Gomes Aguiar family
in local politics has been long documented by several studies. One of his ancestors was appointed as an intendant for Tauá (one of the region’s most prominent municipalities) in the first quarter of the 20th century, staying in office from 1919 to 1927 (Pessoa Jr., 2011). However, despite this early introduction of the family during the authoritarian years of the First Brazilian Republic, it was more recently that the specific lineage of Domingos Neto established itself in state politics.

Domingos Neto’s grandfather, Domingos Gomes de Aguiar, was a doctor. Since the 1970’s he structured a network of medical services offered to the population in the municipality of Tauá free of charge, which rendered him prestige and gratitude among voters and a decades-long political career of prominence. Elected twice as Tauá’s mayor, he also occupied the presidency of the Instituto de Previdência Social of Ceará (1984-1987). One of his nephews, Antônio Câmara, was state deputy for Arena for more than 20 years. When Brazilian democratization occurred in the 1980’s, Antonio Câmara sensed the basis of his power was flickering (Pessoa Jr., 2011). Anticipating he would have troubles competing against democratic political forces, and with the loss of support from state government after Tasso Jereissate was elected state governor in 1986, Antônio Câmara decided it was time to leave public office behind (Pessoa Jr., 2011).

Willing to deliver the political baton of the family to a successor, together with Domingos Gomes, Antônio Câmara decided it was time to launch Domingos Filho’s career and appointed him as his legislative assessor in Assembleia Estadual in 1992 - introducing him into state politics. In the following elections, in 1994, Domingos Filho’s was elected as a state deputy in Ceará. Ultimately it was his successful career that later paved the way for his son to be federal deputy (2010, 2014 and 2018) and his wife to be mayor of Tauá (2000, 2004 and 2012).

According to Pessoa Jr. (who studied Domingos Filho’s electoral strategies as a state deputy), in the beginning he started as an opponent for both the state and local executives in Tauá. In order to leverage his political career in this hostile context, his strategy was to act directly with neighborhood associations in the municipality:

> bringing construction, projects and resources to these institutions, without going through the intermediation of the mayor […]. Resources [for associations] were obtained from the state bureaucracy [where his father worked], through the political influence of either allies in the first and second echelons of the state executive [offices] or from federal deputies. (Pessoa Jr., 2011, p.121), author translation.

Through this particularized support to local organizations, Domingos Filho increased his popularity among voters at the local level, thus expanding the network
of continuous favors provided to voters initially established by his father. Because of a division of political roles within his family, in which his wife was presented to the local executive offices of Tauá while he pursued office as a state deputy, Domingos Filho’s prominence rose.

In 2006, when Cid Ferreira Gomes was elected governor of Ceará, Domingos Filho started to enjoy the perks of being an incumbent. His role within state politics grew, as both the flow of resources dispensed towards his political supporters expanded and his electoral success gave him notoriety in the state executive administration. He became President of the State Assembly from 2007-2010 and in the 2010 elections joined as a vice-governor candidate in Cid’s successful re-election campaign. It was in this year that Domingos Neto ran as a candidate for the federal deputy office. In this campaign, support from the governor, along with his family’s established attendance to voters and local organizations, were considered crucial for Domingos Neto becoming the most voted for candidate for federal deputy office in the state in 2010 (Pessoa Jr., 2011, p.168) - a tremendous achievement considering he was only 22 years old.

Nevertheless, political ties between the leader of this traditional family, Domingos Filho, and the group, represented by Cid Gomes in Ceará’s politics, frayed with time. In the 2016 local elections, his wife failed to be re-elected as a mayor of Tauá, and in the following year a dispute involving competition for the State Assembly led the governor, Camilo Santana (PT), to extinguish the Tribunal de Contas Municipal of Ceará, an established institution focused on the oversight of mayoralty accounts, where Domingos Filho occupied a prominent role as its President at the time. Having his family lost both the support from the state government and their dominance over the local Executive in Tauá between 2014 and 2018, in the later elections Domingos Neto’s strategies encountered a perfect context for change.

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13 It is worth noting that the attendance at “Consultório da Amizade”, the health organization created by Domingos Gomes de Aguiar in Tauá, was still active as of the 2010 elections, organized by Domingos Filho’s mother, Mônica Gomes de Aguiar.

Traditional clientelism, as an electoral strategy to elicit voters, faces difficulties in the absence of support from the executive office because, as we have seen in Papers Two and Three, a continuous flow of resources is required to perform it adequately. At the local level, supporters are inclined to turn towards former opponents in order to maintain streams of resources running at their bailiwicks, while at the state level politicians are inclined to see incumbents who lose elections as less efficient brokers. Facing such constraints in the midterm of his second mandate as a federal representative in Camara dos Deputados, Domingos Neto might have been inclined to turn away from the political traditions of his father, changing from long to short-term clientelism in the 2018 elections as a means to compensate for the loss of electoral support caused by a possible discontinuity in the political resources available for his candidacy at both state and local levels of the executive offices.

This hypothesis is supported by the analysis of his electoral volatility. In 2014, while Domingos Neto was a re-election candidate, his volatility was approximately 30 p.p. In 2018, however, it jumped to 49 p.p, an increase of more than 55 percentage points. Thus, while Domingos Neto counted on successful political articulation of his father at the state and regional levels, his bailiwicks were more constant. Nevertheless, as the political context for him and his family changed after 2016, he might have been more inclined to use the short-term clientelism strategy to elicit support from local leaders and organizations formerly gained with traditional clientelism.

Table 4 below provides further insight into this reasoning. It depicts the ten municipalities in which Domingos Neto experienced more electoral volatility between the 2014 and 2018 elections. We can see from the table that a significant portion of his electoral volatility - 34% approximately (16.5 out of 49 p.p.) - was driven by electoral volatility calculated in these ten cities alone. Moreover, in eight of these ten municipalities, the number of votes he received in the 2018 elections increased disproportionately when compared to his 2014 performance.

In Caucaia, for instance, a municipality in the metropolitan area of Fortaleza, his votes went from 508 in 2014 to more than 13,000 four years later. The success in this municipality in 2018 could indicate the strength of investing in new brokerage networks locally circumscribed. In Assaré, Barro, Acopiara, Beberibe, Paracuru, Tianguá and Araripe his vote share increase between elections is likewise impressive.

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16The electoral volatility displayed by Domingos Neto in 2018 was greater than that of 95% of all candidates in the same year.
Table 4: Domingos Neto’s 10 most inconsistent electorates
Number of Votes, Percent Change and Rank Position in 2014 and 2018.

<table>
<thead>
<tr>
<th>Position</th>
<th>City</th>
<th>Votes 2014</th>
<th>Votes 2018</th>
<th>Percent Change</th>
<th>2014 Rank</th>
<th>2018 Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAUCAIA</td>
<td>508</td>
<td>13,631</td>
<td>12%</td>
<td>59</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>ACOPIARA</td>
<td>102</td>
<td>6,000</td>
<td>5%</td>
<td>85</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>BARRO</td>
<td>63</td>
<td>3,583</td>
<td>3%</td>
<td>109</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>ASSARÉ</td>
<td>43</td>
<td>3,229</td>
<td>3%</td>
<td>126</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>AIUABA</td>
<td>2,227</td>
<td>3,968</td>
<td>2%</td>
<td>29</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>BEBERIBE</td>
<td>96</td>
<td>2,093</td>
<td>2%</td>
<td>86</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>PARACURU</td>
<td>47</td>
<td>1,909</td>
<td>2%</td>
<td>122</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>TIANGUÁ</td>
<td>114</td>
<td>1,873</td>
<td>2%</td>
<td>79</td>
<td>16</td>
</tr>
<tr>
<td>9</td>
<td>ARARIPE</td>
<td>7</td>
<td>1,573</td>
<td>1%</td>
<td>173</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>TAUÁ</td>
<td>15,563</td>
<td>10,785</td>
<td>1%</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Total: 18,770 votes in 2014, 48,644 votes in 2018, 33% percent change.

Source: Brazilian Electoral Data - TSE 2018.

These patterns are further amplified when we analyze the differences in rank positions of cities in his profile across elections. Assaré, for instance, leaves the 126th position of his vote ranking in cities in 2014 to become the 9th municipality where he received most of his votes in 2018. Acopiara leaves the 85th position to become his third main stronghold in the same period and Caucaia goes from 59th to first. Nevertheless, in Aiubá his increase in votes was moderate when compared to other cities, and though Tauá remained his second most important stronghold, he actually lost almost five thousand votes there between elections, a decrease of approximately 31%. This evidence is in accordance with the description of his family’s loss of political power after the 2016 municipal elections, where his mother failed to get elected as mayor of the city.

If the hypothesis is reasonable that Domingos Neto applied a short-term clientelism strategy in the 2018 elections, we should find that the concentration per precinct in the municipalities where he increased his vote shares by most should be greater than in the other municipalities where he received votes. Figure 5 provides evidence that supports this hypothesis.

Torres (2018) documented that Domingos Neto had a prominent role in the political rise of an opponent elected to mayor in the municipality of Acarape. Though the author also cites the use of vote buying in the 2016 local elections, it is possible that the partisan relationship between them strengthened the support received by the federal deputy candidate in 2018.

Nevertheless, as we can see from Figure 5.b, differences observed in precinct concentration between groups of municipalities are robust when excluding the cities.
Figure 5: Domingos Neto’s Precinct Concentration per Group - Different cutoff points.

(a) All cities

(b) Cities with the same party as the mayor excluded

Source: TSE 2018.
where the 2016 mayor was from the same party as Domingos Neto. Moreover, in the period between 2010 and 2018, the candidate saw his votes there actually **decline** from 2,030 in 2010 to 1,470 in 2018.\(^{17}\)

Together, these findings offer evidence that in the case of Domingos Neto in 2018, short-term clientelist theory can be applicable. When clientelist candidates display elevated electoral volatility, they are possibly using clientelist strategies in the forms described by short-term clientelism, increasing their vote shares in cities through the hiring of brokers whose political influence gets concentrated at the precinct level. It was hypothesized that this occurs because, at the precinct level, candidates can check the performance of brokers hired to work with them efficiently. Evidence provided by the case study of Domingos Neto’s electoral volatility and precinct concentration in 2018 provided support for this hypothesis. In the next section a similar analysis is performed for André Fufuca, a federal deputy from the state of Maranhão.

### 0.4.3 André Fufuca: highly unstable votes in Maranhão

Brazilian federal deputy André Fufuca is a doctor and current member of Partido Progressista (PP)\(^{18}\) in his second mandate in the Camara dos Deputados. In 2017, he became a target of national newspapers for assuming the Presidency of the Camara dos Deputados temporarily, during an absence of deputy Rodrigo Maia and his successor.\(^{19}\) Newspapers cited his relationship with former deputy Eduardo Cunha, currently imprisoned for corruption in the Lava-Jato scandal. His own party, PP, has had the greatest number of politicians accused by the investigation so far.

Also known as Fufuquinha, André Luiz Carvalho Ribeiro is a son of the current mayor of Alto Alegre do Pindaré, a city located in the Amazon forest area of Maranhão. Francisco Ribeiro Dantas (Fufuca) started his political career in 1988 as a local councilor in the municipality of Santa Luzia, the city from which Alto Alegre do Pindaré was later emancipated. He advocated strongly for the city’s liberation as a municipality during his mandate. After succeeding in this petition, in 1996 Mr. Dantas was elected as Alto Alegre do Pindaré’s first mayor and re-inducted to office

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\(^{17}\) The maximum votes Domingos Neto received in Acarape was in 2014, where 2,420 voters cast their ballots for him.

\(^{18}\) He was first elected as a state deputy by PSDB and later joined Partido Social Democrático - in and after that PEN - the organization for which he received his first mandate as a federal deputy in 2014.

\(^{19}\) Earlier, his most notorious political ally, Eduardo Cunha (PMDB/RJ), served as President in Mesa Diretora.
In the following elections.

In 2006 he competed for office as a state deputy and was later appointed as a government secretary during Roseana Sarney’s mandate. He was later impeded to compete electorally because of criminal accusations (which included a farm workers’ slavery conviction) and then launched his son’s candidacy for state deputy instead. In 2016, again able to compete in elections, Fufuca presented himself for mayoral elections at Alto Alegra do Pindaré. A prosecutor from the Tribunal Regional Eleitoral in Maranhão found however that some of his campaign acts could be considered illegal, and asked for the mayor’s candidacy obliteration.\(^{20}\)

In 2010, while he was a candidate for the State Assembly, André Fufuca was investigated for vote buying.\(^{21}\) The investigation was initiated based on a testimony given by José Ribamar Silva Dias. According to Mr. Dias, the then candidate had sponsored the construction of a well to capture and distribute water in the district of Zumbi, located in the Municipality of Araioses in Maranhão. Allegedly these investments were made with the objective of obtaining votes from the locality, thus configuring a conditional exchange of benefits for votes that is forbidden by Brazilian law. Later, testimonies offered by three individuals claimed that materials and services demanded for the well construction were financed by the community itself. This served as a basis for the Procuradoria Geral to dismiss the investigation. Other than Mr. Dias, no one from the locality confirmed that the candidate had offered or exchanged benefits for votes.

Despite this, analysis of André Fufuca’s electoral data shows evidence that Mr. Dias – albeit lonely – may have been correct in his suspicions. Araioses was the fourth city in which André Fufuca received most votes in 2010, having obtained almost 7% of his vote share there (2,275) from his state’s total. However, in the next elections (and after the denouncement had been made), the votes he received from this municipality dropped significantly. Araioses occupied the 59th position in his profile in the 2014 elections, and only 35 voters cast a ballot for him in the munic-

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\(^{21}\)http://www.stf.jus.br/portal/jurisprudencia/visualizarEmenta.asp?sl=000281084base=baseMonocraticas
ipality. Although he would later raise the number to 756 in the 2018 elections, the municipality did not express the same preponderance over his electorate profile as in his first competition.

Between 2010 and 2014, André Fufuca’s electoral volatility was 62 p.p - greater than 95% of all candidates that year (including all those who were changing offices from state to federal deputy in the data set). Elected for his first term to federal deputy in 2014 and re-elected to office in 2018, we could expect his volatility to decrease in 2018, as the candidate was running for the same office. Nevertheless, his electoral volatility in 2018 was found to be even higher, at 71%. Why would a candidate exchange conditional benefits in places he is not expected to remain? And why is he apparently not expected to remain anywhere?

While short-term clientelism theory offers one possible explanation for these questions, let’s consider some alternative mechanisms. First, it could be the case that André Fufuca’s volatility is driven not by a constant change in the municipalities in which he is elected, but by a constant growth of his popularity in the same municipalities. In order to understand this issue, Table 5 was assembled. It depicts vote totals, volatility and rank position for the first ten municipalities in which André Fufuca displayed most electoral volatility between the 2014 and 2018 elections.

**Table 5:** André Fufuca’s 10 most inconsistent electorates

<table>
<thead>
<tr>
<th>Position</th>
<th>City</th>
<th>Votes 2014</th>
<th>Votes 2018</th>
<th>Percent Change</th>
<th>2014 Rank</th>
<th>2018 Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PINHEIRO</td>
<td>12</td>
<td>8,723</td>
<td>8%</td>
<td>115</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>SÃO DOMINGOS DO MARANHÃO</td>
<td>18</td>
<td>4,134</td>
<td>4%</td>
<td>92</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>PENALVA</td>
<td>16</td>
<td>4,243</td>
<td>4%</td>
<td>102</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>LAGO DA PEDRA</td>
<td>18</td>
<td>4,122</td>
<td>4%</td>
<td>91</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>BALSAS</td>
<td>1,512</td>
<td>6,608</td>
<td>4%</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>BACABAL</td>
<td>60</td>
<td>3,238</td>
<td>3%</td>
<td>32</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>ITINGA DO MARANHÃO</td>
<td>6</td>
<td>3,154</td>
<td>3%</td>
<td>142</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>PAULO RAMOS</td>
<td>3</td>
<td>2,923</td>
<td>3%</td>
<td>171</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>PALMEIRÂNDIA</td>
<td>12</td>
<td>2,844</td>
<td>3%</td>
<td>114</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>ESTREITO</td>
<td>15</td>
<td>2,756</td>
<td>3%</td>
<td>104</td>
<td>13</td>
</tr>
</tbody>
</table>

**Total:** 1,648 43,165 39% - -

*Source: Brazilian Electoral Data - TSE 2018.*

In nine out of the ten cities depicted in Table 5, André Fufuca changed from 60 or less votes in 2014 to a minimum of more than 2,000 votes four years later. Moreover, electoral volatility in these ten cities was responsible for 27% of his total electoral volatility in 2018. The municipality of Itatinga do Maranhão went from being the municipality listed in the 171st position in his 2014 profile to being in 10th

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22 As we can see in Appendix I, these levels of electoral volatility are barely discernible from completely random voting patterns.
in 2018. Pinheiro, a municipality that was his 115th most important city in terms of votes cast in 2014, rose to the 1st position within four years.

As a matter of fact, it is worth noting that almost all of the main strongholds of André Fufuca in the 2018 elections were completely absent from his electoral profile four years earlier. Pinheiro, São Domingos do Maranhão, Penalva, Lago da Pedra, Bacabal, Itinga do Maranhão, Paulo Ramos, Palmeirândia and Estreito left the far tail positions of his vote share distributions in 2014 to become the upper rows in 2018. This is a phenomenon completely at odds with what current theories would predict for a clientelist candidate.

It is not possible for current theories of traditional clientelism to explain this phenomenon. While the idea that vote buying might be surprising at first, consider it for a moment; let us assume it was the case in André Fufuca’s 2018 elections. Say that in all cities in which he disproportionately increased his vote shares (depicted above), all votes were bought. How much would he have spent? Is it something reasonable to expect?

Assume that each vote was exchanged for R$ 50 reais. Now consider that, excluding Balsas, all other municipalities were introduced as his main strongholds in 2018, thus holding only a negligible participation in his former elections’ results. This leaves us with 36,548 votes. Buying these voters would have cost him - following our assumption about prices - R$ 1,827,400 reais. Although it might seem an unreasonable amount of investment at first, depending on the expected returns the candidate thinks he is likely to achieve when elected, he may consider it worthwhile. Mr. Eduardo Cunha (a former connection of André Fufuca), for instance, was found by the Lava-Jato investigations to hold almost four times as much this amount in two of his foreign bank accounts.²³

Additionally, we should put in perspective that many of these transactions are being mediated by locally circumscribed brokers that can decrease spending and make voters more compliant. From the analysis of his political patterns, it is possible that André Fufuca has been able to gather an ample base of political support hiring brokers (and possibly buying voters) during elections. Moreover, exchanging benefits for votes during elections at the aggregated level is in accordance with the evidence provided by the accusations of vote buying that once weighed against the candidate.

²³O que acontece agora com o dinheiro de Cunha na Suíça?. https://www.bbc.com/portuguese/brasil-37346716
Figure 7: André Fufuca’s Precinct Concentration per Group - Different cutoff points.

(a) All cities

(b) Cities with the same party as the mayor excluded

Source: TSE 2018.
One of the implications of short-term clientelism theory is that at the local level of precincts, brokers performance is monitorable by candidates. Therefore, I ran the same test presented above, and checked whether in 2018 election candidate André Fufuca’s precinct concentration was higher in the precincts located in municipalities in which he increased his vote shares most.

Figure 7 depicts the results of this comparison. It is shown that not only did the difference between groups increase with the cutoff applied, but also that it was greater in the case where we excluded all municipalities in which the mayor was from Fufucas’ party. This means that although there was an effect of receiving support from mayors from his party, when all these municipalities were ignored, precincts located at the places where he gained votes were even more concentrated when compared to precincts in remaining municipalities. This shows that in many cities where he did receive partisan support, precinct ratios for his votes in those cities were likely more dispersed than concentrated.

In the second case study analyzed, we were able to observe that despite their many differences, both André Fufuca and Domingos Neto displayed voting patterns consistent with short-term clientelism theory. For both, total electoral volatility was greatly concentrated in patterns displayed by the first ten cities in which they experienced greater vote share changes. These changes are mainly positive and these electoral patterns are unlikely to be explained by either programmatic or traditional clientelism theories.

Additionally, comparison of precinct concentration per groups of cities showed that in the cities where they received the highest increase in vote shares, both candidates displayed greater concentrations of votes at the precinct level. This evidence was robust to several cutoff points, and to the exclusion of municipalities in which the mayor was from the same party as the candidate. Next, I present the same analysis of our final case study and perform a comparison of his electoral patterns with a programmatic candidate.

0.4.4 Zé Silva: vote buying and concentration patterns compared in Minas Gerais

Zé Silva is an engineer employed by the public company Empresa de Assitência Técnica e Extensão Rural of Minas Gerais (EMATER-MG) who was first elected to the Camara dos Deputados in 2010 by Partido Social Democrata Brasileiro (PSDB).
During the 2000’s, Zé Silva’s political career consolidated through the occupation of diverse offices related to agriculture management in the state executive offices of Minas Gerais, appointed to distinct governorships from PSDB (Aécio Neves and Antônio Anastasia). From 2003 to 2010, he assumed the presidency of EMATER, a position he occupied in conjunction with the presidency of the Associação Brasileira das Entidades Públicas de Assistência Técnica e Extensão Rural (ASBRAER) between 2006 and 2010. Later, in 2013, he distanced himself from his legislative obligations in order to perform as Secretary of Labor in the Minas Gerais’ executive administration.

Despite having achieved prominence as a politician, he started his walk into the hall of federal politics with what many would consider a left foot. In his electoral debut, Zé Silva was accused of and investigated for vote buying. Several accounting receipts demonstrating payments from his campaign to local leaders and voters were apprehended by Ministerio Publico Estadual officers in the Operação Conto do Vigário investigation. Additionally, in the 2018 elections, Zé Silva was found to improperly distribute public goods to propagandize his campaign.24

During 2010, a company located in the city of Januária – in the countryside of Minas – had its communications intercepted by investigators, which had been focusing on frauds in public spending. Nevertheless, part of the financial accounting of Zé Silva’s campaign appeared in the facsimiles emitted by the company. In August, just prior to the 2010 elections, a document titled “Leaders that will be contracted for the 2010 campaign for federal deputy” was transmitted appointing more than 20 individuals who would receive money in exchange for their support for the candidate.25 Another fax, transmitted in September, documented the payment of gasoline to several local leaders involved in his campaign. According to the document that required the dismissal of the accusation:26,27

among the facts imputed to the federal deputy, José Silva Soares, would be the electoral co-optation of voters in the region of Januária-MG through the payment of one hundred and forty thousand reais (R$ 140,000) [to local leaders], as well as the fuel supplied in exchange for votes. It is also noted that the accounts provided are not in line with the total expenditures incurred during the 2010 election campaign.

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24MP Eleitoral: deputado federal reeleito pode ter diploma cassado por uso indevido de bens do Incra em MG. http://www.mpf.mp.br/mg/sala-de-impressa/noticias-mg/deputado-federal-reeleito-pode-ter-diploma-cassado-por-uso-indevido-de-bens-do-incra
26http://www.stf.jus.br/portal/processo/verProcessoTexto.asp?id=3826188tipoApp=RTF
27Despite the material evidence and financial receipts found during the investigation, based on the accused’s declarations the accusation was archived due to a lack of proof.
Table 6: Zé Silva’s 10 most inconsistent electorates
Number of Votes, Volatility and Rank Position in 2014 and 2018.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UNAI</td>
<td>1,015</td>
<td>3,703</td>
<td>2%</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>PONTO DOS VOLANTES</td>
<td>25</td>
<td>2,529</td>
<td>2%</td>
<td>346</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>ALMENARA</td>
<td>1,376</td>
<td>3,867</td>
<td>2%</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>UBERLÂNDIA</td>
<td>416</td>
<td>2,263</td>
<td>2%</td>
<td>69</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>JEQUITINHONHA</td>
<td>472</td>
<td>2,214</td>
<td>2%</td>
<td>62</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>JOÃO PINHEIRO</td>
<td>377</td>
<td>1,719</td>
<td>1%</td>
<td>71</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>CAMPINA VERDE</td>
<td>957</td>
<td>2,222</td>
<td>1%</td>
<td>25</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>BURITIS</td>
<td>48</td>
<td>1,270</td>
<td>1%</td>
<td>263</td>
<td>17</td>
</tr>
<tr>
<td>9</td>
<td>OURO PRETO</td>
<td>21</td>
<td>1,167</td>
<td>1%</td>
<td>378</td>
<td>18</td>
</tr>
<tr>
<td>10</td>
<td>ARINOS</td>
<td>140</td>
<td>1,100</td>
<td>1%</td>
<td>150</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>4,847</strong></td>
<td><strong>22,054</strong></td>
<td><strong>15%</strong></td>
<td><strong>-</strong></td>
<td><strong>-</strong></td>
</tr>
</tbody>
</table>

Source: Brazilian Electoral Data - TSE 2018.

Zé Silva was able to achieve 4,432 votes in Januária in the 2010 elections. However, the sustainability of this electorate proved difficult. In 2014 he received less than half of his first electoral output there (1,957), falling to a disastrous 163 votes received in the municipality in the 2018 elections. Between the 2010 and 2014 elections, Zé Silva’s electoral volatility was 39 p.p, and in the 2018 race it increased moderately to 45 p.p. Table 6 above presents the ten municipalities in which Zé Silva changed his bailiwicks most in 2018, when compared to 2014.

We can see from the table that while Zé Silva has been found to have an elevated volatility, his patterns could be considered more stable than our two other cases studied thus far. These ten cities represent around 17% of the candidate’s total volatility, a considerably lower proportion than the 34% and 27% that Domingos Neto and André Fufuca respectively concentrated for electoral volatility in their first most inconstant electorates. Moreover, only in three of the ten municipalities listed above did the candidate receive less than 100 votes in the 2014 elections. This suggests that his volatility has been partially leveraged by an increase in votes in cities already well positioned in his profile in former elections.

Almenara, for instance, is a city that goes from the 17th position to being his first main stronghold in the 2018 elections. Such transformations could be compatible with either pork or traditional clientelism theory. Nevertheless, only in two cities, Unaí and Campina Verde...
Figure 9: Zé Silva’s Precinct Concentration per Group - Different cutoff points.

(Alongside Almenara), are these electoral volatility patterns replicated. Ponto dos Volantes, on the other hand, goes from the 346th position to the fourth most important city of his voting distribution in four years. Ouro Preto, Buritis and Arinos follow similar patterns while Uberlândia, Jequitinhonha and João Pinheiro are graduated from mid-upper positions to top cities where the candidate receives support.

Following the method applied to the other cases studied, I have tested the differences in precinct concentration between groups of cities, checking if in the cities where the candidate most greatly increased his vote shares his precinct concentrations were higher. Figure 9 depicts the results.

We can see that, albeit present, differences in precinct concentration between groups of cities in which the candidate most greatly increased his vote shares between the 2014 and 2018 elections were not as significant as in the other cases analyzed. Together with the results demonstrated in Table 6, we can conjecture whether this candidate may have relied less on short-term clientelism in the 2018 elections.
Figure 10: Aurea Carolina’s Precinct Concentration per Group - Different cutoff points.

![Graph showing Aurea Carolina’s Precinct Concentration per Group - Different cutoff points. Source: TSE 2018.](image)

Thus far, I have been able to show that the theoretical implications of short-term clientelism apply to the cases studied. More specifically, we have seen that candidates’ concentrations at the precinct level are higher in precincts located in municipalities in which vote shares across elections greatly increase. Similar differences were found for all of our three candidates, although in the analysis of Zé Silva’s voting patterns this effect tended to be concentrated at higher cutoff points. However, we cannot be certain that entering with a high precinct concentration percentage is just a general characteristic of politicians’ strategies.

In order to provide some insight into the matter, I have performed the analysis of precinct concentration for Aurea Carolina, a federal deputy elected in 2018 in the same state as Zé Silva. Aurea is a young black woman from the leftist Partido Socialismo e Liberdade (PSOL) who advocates for human rights. She was elected as a councilor to Belo Horizonte in the 2016 elections, and in 2018 applied for the office of federal deputy. Her volatility was calculated using the formula described above, but while considering her voting patterns as of 2016 as the baseline.\(^\text{28}\) Results for this analysis are depicted in Figure 10.

As we can see from Figure 10, Aurea displays a pattern inverse to the ones found in the analysis of all other cases studied.\(^\text{29}\) The more she gains votes in a

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\(^{28}\) This is an inflated method to calculate electoral volatility, as the districts in the case of councilor positions are the municipalities themselves while in the case of federal deputies it is the state.

\(^{29}\) No mayors from PSOL were elected in Minas Gerais in 2016.
municipality, the less concentrated her votes are there at the precinct level. Only at the highest level is 99% average precinct concentration found to be greater in the municipalities in which she increases her vote shares. It is also worthy of note that while Aurea’s maximum precinct concentration was 30% approximately, Zé Silva’s was 80%, André Fufuca’s 75% and Domingos Neto’s 77%. Therefore, when it comes to their voting patterns, we can conclude that programmatic and short-term clientelists were not found to display similar trends.

Analysis of the case studies presented in this section has provided support for the hypothesis that clientelism is consistent with volatile political bases, thus strengthening short-term clientelism theory. I have shown that the theory was robust to a smoking-gun hypothesis test, designed to explain why, in the cases selected, vote buying was a likely cause of the elevated volatility. The next section summarizes this paper.

0.5 Implications

The theory developed in previous papers stresses that in certain cases, it might be of interest to politicians to use short-term clientelism as an electoral strategy. However, the use of short-term clientelism causes instability and uncertainty in a candidate’s electoral bailiwicks - an uncertainty that is captured by the electoral volatility measures. It was hypothesized that although candidates can quickly gain access to localized political markets and votes using vote buying, they face challenges and usually fail to maintain those connections with local electorates in time. In this section I used both quantitative analysis and case study methodology to test different predictions of my theory.

First, it was shown that there is much variation in volatility levels when we analyze individual outcomes per year, thus strengthening the argument that different electoral strategies are displayed when it comes to Brazilian candidates for federal deputy. Second, I designed a smoking-gun test in order to understand if, in the case of politicians previously known to use vote buying and with highly inconsistent electoral bailiwicks, some of the predictions of the short-term clientelism theory would hold. Composed of three distinct tests, this case study combined the analysis of three hypotheses - two necessary and one necessary and sufficient. The first two hypotheses were checked for all three cases selected, while the third test was applied to only one of the cases. However preliminary, results reported in the previous
section indicate that different implications of my theoretical argument for why vote buying causes volatility are sustained by evidence for all three cases analyzed. More specifically, they also rule out distinct alternative hypotheses for the findings.

For instance, elevated volatility levels for the candidates studied could be explained by traditional clientelism theory if candidates grew or expanded their dominance and monopoly in several cities at the same time. If this was so, we should observe little or no change in the rank position of a municipality in a candidate’s most significant cities’ rank, despite their elevated volatility. For two of the candidates, analyzed volatility at the municipal level was not majorly driven by a municipality (or a preferential group of them) in constant growth, but rather by negligibly or barely-considerable cities in their former voting shares distributions arising to newly acquired significance status as their “preferential electorate”. For the Zé Silva case study, results for this analysis were mixed.

For each case study, the analysis also considered the concentration per electoral precinct, and showed how their voting concentration patterns varied across the groups of cities in which they won most of their voting shares between elections. For short-clientelism to work as the theory proposes in Papers Two and Three, it was necessary that at the local level of neighborhoods, districts and communities a local broker was hired to propagandize for the candidate, deliver resources to voters and demand their votes in return. Although at the individual level votes are secret and hardly monitorable, at the precinct level the performance of these local brokers was conjectured to be subject to post-election monitoring by the aggregated results per precinct.

Therefore, if vote buying is the main cause of increased volatility levels for the candidates analyzed in our case study, we should expect that in the municipalities where they increase their voting shares more between the 2014 and 2018 elections, the concentration of their votes per electoral precinct would be greater. For each of all three cases selected, results provided evidence to support this hypothesis. That candidates received significantly more concentrated votes at the precinct level in the municipalities in which they further increase their voting shares strengthens the smoking-gun test of the hypotheses of my theory. Results show that this hypothesis holds for all cases analyzed – although in the case of Zé Silva they were less robust to distinct cutoff points selected for increases in vote shares among municipalities.

Lastly, an alternative explanation was preliminarily explored for the concentration per precinct patterns depicted for our case studies, as an elevated concentra-
tion per precinct might be just a common feature for candidates expanding their electorate. Their entrance in new municipalities would occur through concentrated voting patterns at the precinct level, regardless of which electoral strategies they use specifically. Following this hypothesis, a greater degree of concentration per precinct could also be expected in the added municipalities where a programmatic candidate conquers new voters.

It is possible for instance that when ideological candidates are expanding their vote shares through local mobilization, their concentration in newly acquired municipalities could be higher at the precinct level just as a consequence of the nature of their brokers actuation there. Mobilizing voters at the local level directly, eliciting their sincere preferences related to ideological politics through the engagement of supporters such as local movements and community leaders for instance, would render their concentration per precinct to be higher in the cities where they gain most votes. Therefore, for both clientelist and programmatic candidates the patterns of concentration per precinct in the cities where they experience their greatest vote share increases between elections should be similar. Conversely, if expanding their electorate is associated with a candidate’s vote buying strategy more specifically as hypothesized, programmatic candidates (assuming they do not use vote buying) should display more concentration in the precincts that they are able to keep stable in time more than in the newly acquired ones; while the opposite should be true for clientelist candidates.

I performed a comparison for precincts’ concentration patterns between a programmatic candidate with high volatility\textsuperscript{30} and one individual in our case study. Both were elected in 2018 and from the same state, which was thought to reduce discrepancies.\textsuperscript{31} It is shown that concentration per precinct patterns are quite different for both candidates. In the programmatic politician’s case, she expanded her voting

\textsuperscript{30}The programmatic candidate selected for comparison, Aurea Carolina from Partido Socialismo e Liberdade (PSOL) in Minas Gerais, prior to 2018 was a candidate for the Câmara de Vereadores of Belo Horizonte in 2016. Her volatility was calculated using the 2016 election as baseline, which might introduce a certain degree of distortion in the measurement. We do not know, for instance, what would have been her previous voting outputs per municipality had she presented to the state electorate before, as a consequence of the change in district zones (from city to state representative) in the offices she has run for. Nevertheless, if the gain in her votes per district in 2018 includes the “potential” votes she could have received in the past, or expresses the ties her party had built with local movements, the implication of this distortion should be that more concentration was to be expected by the alternative explanation exposed previously.

\textsuperscript{31}Although I expected to perform this comparison for all three cases selected, in only one of the states was it possible to find an unambiguous programmatic candidate elected to the Câmara dos Deputados in 2018 that also displayed elevated volatility.
shares in cities where her precinct concentration was usually lower (except at the 99% cutoff point). An opposite pattern was verified for all three cases studied.

In summary, volatility matters because it can express the underlying electoral strategies employed by candidates. Particularly for the case of vote buying, short-term clientelism increases a candidate’s vote share in a given city, an increase that was supposed to occur through elevated concentration at the precinct level. Theoretical arguments were confirmed by the first two smoking-gun tests performed, and further strengthened by the third one, which found that a programmatic candidate depicted reversed patterns.

However, it remains for further clarification the role of mayoral elections and pork distribution in increased vote shares and precinct concentration, and its implications for short-term clientelism theory in general. It is possible for instance that a candidate’s increase in votes at the local level (and even their effective usage of vote buying) is facilitated when a change in the political forces occurs in the local election midterms of the deputies’ race. As Novaes (2017) underscores, electing mayors is a tool in a governor’s toolkit to amplify the number of deputies elected by their parties - and their chances of reelection. Should we consider all candidates running for office, could we distinguish from the distribution of electoral volatility alone which among them are effectively buying votes and hiring brokers temporarily from those who were distributing pork and benefits to their local followers?

In this study, I have partially ruled out this alternative explanation by design, selecting only cases in which politicians associated with clientelism and vote buying were included. It contributes to theories of clientelism by providing evidence that, for some clientelist politicians, inconsistent change of bailiwicks may not only be expected, but also explained as hypothesized by short-term clientelism theory. Nevertheless, as a small-n research design, its implications are not necessarily valid ubiquitously. Chances are that there is more than we can see from this investigation about the politics of volatility.
Bibliography


