Pontifícia Universidade Católica do Rio de Janeiro

Departamento de Economia

Monografia de Final de Curso

The Effects of Changes in Campaign Financing Rules on Female Candidacies Funding in the 2018 Elections

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Rio de Janeiro, Brasil

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DO RIO DE JANEIRO

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Declaro que o presente trabalho é de minha autoria e que não recorri para realizá-lo, a nenhuma forma de ajuda externa, exceto quando autorizado pelo professor tutor.

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Acknowledgments

Abstract

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This study analyses the effects of changes in campaign financing rules on the funding of female candidacies in the 2018 elections. In the beginning of 2018 the Brazilian Supreme Court (STF) and the Superior Electoral Court (TSE) ruled that 30% of the money political parties received from the Party Fund and the Electoral Fund, respectively, should be used to finance female candidacies. A few months later elections were held under the new legislation. Combining a descriptive analysis with a Multi-Way Fixed Effects and Differences in Differences empirical framework I investigate the effects of these changes using data from the TSE electoral data repository. Results suggest that not every party nominally complied with the law and among those who complied factors such as the increase in vice and substitute candidates combined with the use of "Laranja" candidacies hampered its efficacy. Nevertheless, female candidates did receive more money from public funds in the 2018 elections compared to 2014. Political parties who gave fewer resources to women in 2014 were among the ones who changed more their behaviour towards equality in 2018. Placebo regressions and robustness checks support these results.

Keywords: Political Representation; Women in Politics; Campaign Finance; Brazil

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1   Introduction

Women's under-representation in politics is a global phenomenon. Despite some exceptions, like Rwanda, where women are 61.3% of the elected officials for the lower house, they are still very far from reaching equality in the political field. In Brazil, despite comprising 51.8%[1] of the population and 52.6% of the electorate[2] they represented only 14.6% of the elected for the chamber of deputies and 13.6% for the senate in 2018. These numbers place the country at the 143 position[3] in the Inter-Parliamentary Union (IPU) ranking out of roughly 190 countries. To illustrate the situation, Saudi Arabia, the last country in the world to allow women to vote, in 2015, is 29 positions ahead (114).

Aiming to change this scenario, since 1995 Brazil has had political gender quotas. They evolved over time and nowadays mandate that 30% of the candidates for proportionate elections should be women. Especially after the mini-electoral reform in 2009, this cut-off has been reached. Nonetheless, this increase hasn't translated into more votes or better electoral results, with less than 15% of the chamber of deputies and senate being composed by women, as mentioned before[4]. In 2018, new legislation with direct impact over fund distribution intended to make female candidacies more competitive and boost their chances of getting elected. The Brazilian Supreme Court (STF) and the Superior Electoral Court (TSE) ruled that 30% of the money received from the Party Fund and the Electoral Fund, respectively, should be used to finance female candidacies.

This research will study the impacts of this change in legislation on the funding of female candidacies in the 2018 elections. Based on publicly available data from the Superior Electoral Court Repository, I apply an empirical methodology using data from the 2018 and the 2014 elections. First, I employ a Multi-Way Fixed Effects model to analyze how female candidates' funding changed between those years. Then I create a balanced panel with female candidates that ran for both considered elections and apply a Differences in Differences framework to determine how political parties' allocation patterns in 2014 shaped their distributional decisions in 2018.

For the first empirical approach, I divide women into three groups: Outsider candidates, that never ran before; Ever Elected candidates, that have run and won at least once before; Ever Candidates, that have run at least once before but never won. I do so because candidacies vary in multiple aspects that can influence their electoral results other than gender. Hence considering female candidacies as a homogeneous group would be a simplistic assumption. Through a Multi-Way Fixed Effects approach with party, state, and position fixed effects coupled with controls on candidates' observed characteristics I find that Ever Elected candidates received on average approximately 167% more public funds, 198% more party funds, and 221% more total funds

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[1]   Data from the Pesquisa Nacional por Amostra de Domicílios Contínua (PNAD), 2019.
[2]   Data from the Electoral Data Repository from the Superior Electoral Court, 2020.
[3]   Ranking of countries based on their number of women in national parliaments. Situation in October 2020.
[4]   For an analysis on the limits of political gender quotas in Brazil see (Araujo, 2001)

than Outsiders in the 2014 elections. Results suggest that these differences did not change in 2018. Besides, Ever Candidates received on average the same as Outsider candidates in 2014, and this pattern did not change in 2018.

Furthermore, female candidates in general received on average approximately 251% more public funds, 192% more party funds, and 166% more total funds in 2018 compared to 2014. Together, these results suggest that the increase in received funds in 2018 was primarily driven by the change in legislation regarding public funds. Also, it seems like it privileged neither of the three groups in particular, but this does not mean that the money was equally distributed between female candidates in general. Political parties seek to maximize their chances of electing more candidates, and incumbents and those with political experience have a higher probability of winning (Avis et al., 2017). Therefore, it would be reasonable to assume that they would prioritize candidates with such characteristics. Indeed, descriptive data shows evidence that parties concentrated the resources they donated to women on a handful of female candidates. As a matter of fact, two of them gave more than two-thirds of the total amount donated to women to one single female candidate, in both cases a candidate running for president. This suggests that female candidates from parties that have a female presidential candidate are in disadvantage with regards to the amount of funds they can raise.

Regarding the Differences in Differences framework, estimated results suggest that parties who gave proportionately fewer funds for female candidates in 2014 compared to their male counterparts were the ones with larger increases in funding distribution for women in 2018. Still, evidence shows that some parties did not reach the 30% cut-off in 2018, and very few of the ones that did reach the minimum distributed significantly more than that. Consequently, it seems to be the case that the change was primarily led by the new electoral legislation - not yet fully enforced - rather than the consequence of a broader cultural change inside political parties towards more equality. Additionally, I conduct placebo regressions comparing the 2010 and 2014 elections to give support to the main identifying assumption of the model and find evidence that helps improve the confidence in it.

Besides, notably since the mini-electoral reform in 2009, a new kind of electoral fraud grew considerably over subsequent elections: the "Laranja" candidacies. They consist of non-viable, mostly female, candidacies that receive exceedingly few votes and reflect parties' attempt to nominally comply with the quotas while maintaining the status quo (Wylie et al., 2019). I attempt to track down "Laranja" candidacies in the observed period using Malu Gatto and Kirsten Wylie's[5] criteria and find that they receive on average less funding than competitive candidacies. Interestingly, however, descriptive data suggests that such candidacies received more funding in 2018. The scandal involving the PSL is an example of this change. In one of the most emblematic cases, the deputy candidate Lourdes Paixão received a R$400 thousand reais from the Party Fund only a few days before election day but obtained only a scant number of votes. It is suspected that the money was subsequently used to finance a male candidate.

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[5]   In a study published on BBC website: https://www.bbc.com/portuguese/brasil-47446723

This evidence indicates that positive results regarding a more egalitarian distribution of funds should be interpreted with caution as they could be masking the existence of multiple cases of electoral fraud. Besides, descriptive data suggests a negative correlation between the share of funds distributed to female candidates and the share each party received from the Electoral Fund. Hence, it seems like poorer parties are more financially supportive of female candidacies than richer ones.

This study relates to the literature on electoral politics in Brazil, especially that of political finance and women's representation. Its main contribution rests on the fact that, to the best of my knowledge, this is the first intent of measuring the effects of the change in electoral campaign regulation on female candidacies funding in 2018, focusing not only on the candidate but also at the party level. (Wylie, 2020) also studies the consequences of this change, but concentrating on an intersectional approach. She finds evidence suggesting that in 2018 elections had a more (but still not) level playing field in terms of campaign financing, especially for Afro-Brazilian women.

There is an extensive literature on the relationship between money and votes in Brazil, starting with (Samuels, 2001), who found a high correlation between both variables. Since then, others have corroborated this result (Mancuso, 2012); (Sacchet and Speck, 2012); (Speck, 2005). Further, (Speck and Mancuso, 2014) show evidence that the association between finance and electoral performance tends to be more vital for women. These results refer to funding in general, but others have found that the largest gap in campaign revenue was concentrated in donations from corporations (Sacchet, 2011); (Sacchet and Speck, 2012). This kind of donation was banned after the 2014 elections, but up until then it predominated among the top campaign donors, supporting especially male incumbents (Sacchet, 2018).

The use of financial regulation as a tool to correct gender imbalances is a strategy used not only in Brazil. Other countries have adopted similar measures, as a report (Ohman, 2012) from the International Institute for Democracy and Electoral Assistance (IDEA) shows. It documents the existence of direct measures such as the provision of additional funding to parties that respect gender equality and/or reducing it for those who do not. By 2012, 16 countries presented policies of this kind, including France, Italy, and Colombia. Nevertheless, this set of policy instruments does not always display positive results. Analyzing the Italian case, (Feo and Piccio, 2020) argue that if poorly designed, with a lack of functioning mechanisms for sanctions and rewards, its effectiveness can be hampered.

Finally, why is it so essential to implement and support measures to raise the number of women in elected office? The literature provides numerous reasons, related or not with gender quotas. First, (Brollo and Troiano, 2016) find that female mayors are less likely to engage in corruption than male mayors when analyzing close elections in Brazil. Second, looking at the Swedish context, (Besley et al., 2017) find that the gender quotas implemented in the country raised not only female representation but also male politicians' competence. The authors argue that this effect's key driver was the resignation of mediocre men from the political field. Third, (Duflo, 2012) finds a strong link between female empowerment and economic development, while

(Chattopadhyay and Duflo, 2004) argue that the gender of the politician affects the types of public goods provided when studying the Indian case.[6] Lastly, the numbers presented at the beginning of this study for the Brazilian case and its position worldwide summon the urgent need for change.

The rest of this paper is organized as follows: Section 2 will present the Institutional Background on electoral gender quotas and campaign financing legislation in Brazil. Section 3 is the Data section, where I give details on database and variable construction along with a descriptive analysis. Section 4 presents the Empirical strategy, Section 5 shows the results of its application, and Section 6 complements those results with robustness checks. Finally, Section 7 concludes.

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[6]   However, empirical evidence for this seems to be mixed in contexts without reserved seats for women (Pino et al., 2011).

2   Institutional Background

To better understand the present situation, it is useful to detail Brazil's electoral legislation's evolution over the past decades. Focusing on changes related to gender quotas and financing, I will do so here. Section 2.1 highlights the legislation on gender quotas, enumerating some issues related to it. Furthermore, due to this study's focus on Electoral Financing, Section 2.2 clarifies the recent changes in the laws governing money used in elections. Figure 1 summarizes the electoral changes relevant to this analysis in the form of a timeline.

Figure 1 – Electoral Changes Timeline
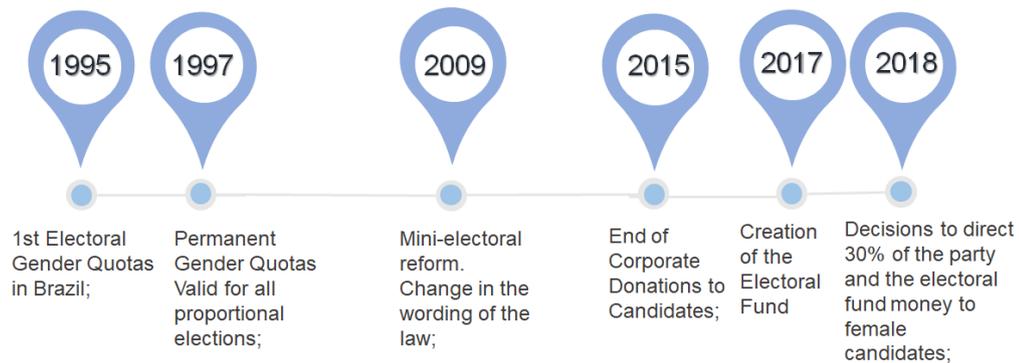
2.1   Electoral Gender Quotas Legislation

The first quota legislation came in the form of the law $(9.100/1995)$[7], authored by the federal deputy Martha Suplicy. It stated that female applicants should fill at least twenty percent of each party's vacancies or coalition. However, it was limited in scope to the municipal level and initially set as a temporary measure, valid only for the 1996 elections. Two years later, law $(9.504/1997)$[8] expanded the scope of the quotas to encompass all proportionate elections and made them permanent. Its text affirmed as follows:

"§ 3 Of the number of vacancies resulting from the rules provided for in this article, each party or coalition shall reserve a minimum of thirty percent and a maximum of seventy percent for candidacies of each sex." (Open translation)

Nonetheless, the new legislation was unable to enhance female participation, which stayed at a low level, with female candidates comprising less than the minimum required of 30%. One of the main reasons for this situation was in the drafting of the law, with the verb chosen to express the need for reserving spots for women being "shall reserve". Literally interpreted, it meant that parties and coalitions should reserve a minimum of 30% of spots in proportional elections for each

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[7]   http://www.planalto.gov.br/ccivil_03/leis/L9100.htm
[8]   http://www.planalto.gov.br/ccivil_03/Leis/L9504.htm

sex, but were not strictly required to present this percentage for the actual run. This situation opened space for parties not to comply with the legislation, arguing that not enough women were willing to pose as candidates despite their efforts. This possibility changed in 2009 when the mini-reform (12.034/2009) [9] modified the normative wording of the law. With a change in the verb form used to "shall fill", the text was now supposedly clear about the obligation to have a minimum of 30% of women in each party or coalition candidate's list for proportional elections.

Given the above, Figure 2 shows the evolution of the percentage of women candidates for the Chamber of Deputies from 2006 to 2018 elections. Although there was an incontestable increase in the share, the percentage has barely grown over the 30% threshold. Even in the 2018 elections, held almost ten years after the 2009 mini-reform, only 31,61% of contestants for the Chamber of Deputies were women. They also still comprise significantly less than 30% of the elected (Figure 3) and receive considerably fewer votes (Figure 4).

Figure 2 – Female candidacies for the Chamber of Deputies, % of the total

Data: Electoral Data Repository, TSE
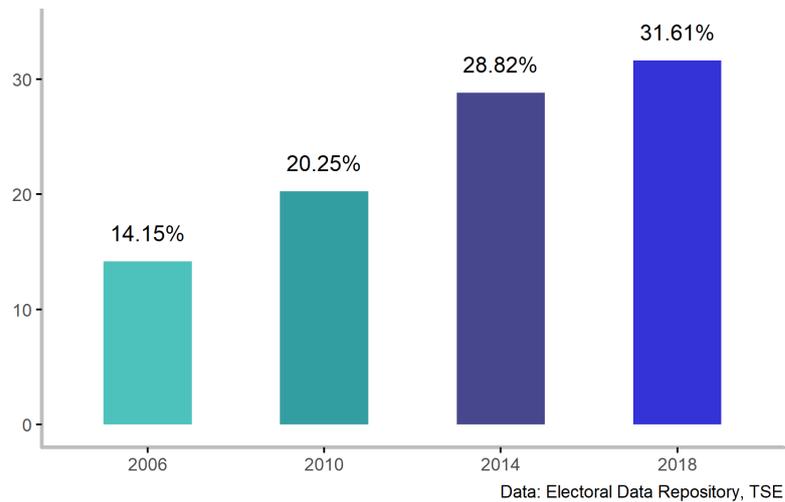
Figure 3 – Female candidates elected for the Chamber of Deputies, % of the total

Data: Electoral Data Repository, TSE

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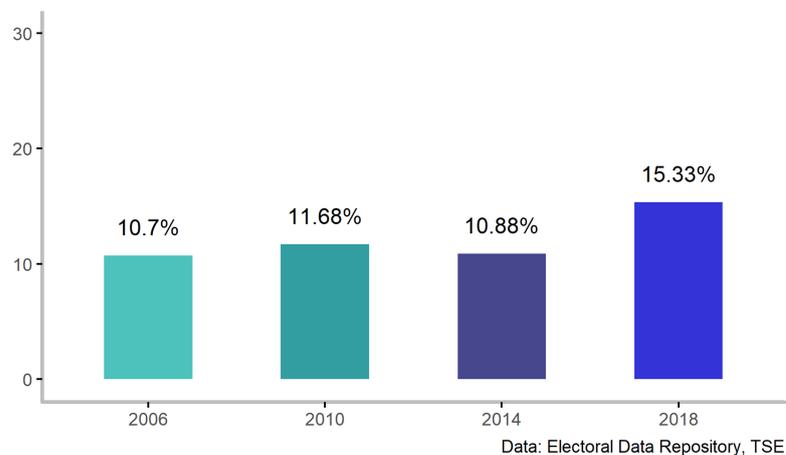
9 http://www.planalto.gov.br/ccivil$_0$3/$_Ato$2007 − 2010/2009/Lei/L12034.htm

Figure 4 – Votes for female candidates for the Chamber of Deputies, % of the total

Data: Electoral Data Repository, TSE
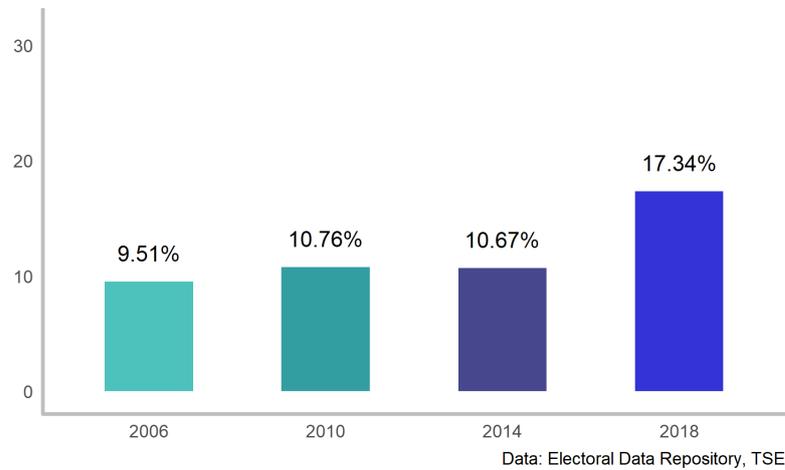
Even though the apparent failure of the quotas as they are is a complicated matter, involving questions that concern the very nature of Brazil's electoral system [10], one crucial factor is the lack of sanctions for non-compliance with the law. The Brazilian legislation does not provide mechanisms to punish parties or coalitions if they do not comply with the quota legislation.

Finally, a remarkable phenomenon emerged amidst this electoral landscape. Especially since the 2009 mini-reform, parties started to launch extreme non-viable female candidacies, receiving either zero or exceedingly few votes. Labeled as "Laranja" candidates, they were a result of their attempt to comply with the quotas nominally while maintaining the status quo (Wylie et al., 2019). Further sections will show more details on this matter. However, it is noteworthy that the scandal of "Laranja" candidacies in the 2018 elections, especially at PSL, the party of the elected president Jair Bolsonaro, raised skepticism about the quota's efficacy. This situation resulted, in 2019, in the project of law (1.256/2019) [11], proposed by the senator Angelo Coronel. Aimed at revoking the existing quotas in the country, it was, however, rejected by commission in terminative decision.[12]

In conclusion, electoral gender quotas in Brazil have changed considerably since first established in 1995. Alterations aimed at improving their efficacy and, ultimately, the number of women in elected office. However, it seems like factors such as the lack of sanctions have allowed parties to resist and continue underinvesting in female candidacies.

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[10] (Araujo, 2001)) talks about the relative inefficacy of gender quotas in open list systems, such as is the Brazilian case. Quotas have proven the most effective in closed lists systems, with the alternation of male and female candidacies ('zip' quotas).

[11] https://www25.senado.leg.br/web/atividade/materias/-/materia/135505

[12] Decision by commission, with the value of a decision from the Senate.

2.2 Electoral Campaign Financing

The legislation governing electoral financing rules has undergone several changes over the last few years. Regarding the electoral period between 2014 and 2018, the most relevant was probably the end of the possibility for political parties and candidates to receive corporate donations, through resolution (23.463/2015) [13]. Before that, corporations were able, by law (8.713/1993), [14] to spend a maximum of 2% of their gross annual revenues in contributions. The extinction of this kind of financing can be directly linked with the "Lava Jato" operation launched in 2014 to investigate money-laundering schemes in Brazil. Since its inception, it has unraveled multiple corruption schemes and condemned, between others, key members of important political parties accused of diverting billions of dollars through procurement contracts for illegal electoral funding (Avis et al., 2017).

To compensate for the extinction of corporate donations, a new fund denominated Electoral Fund was created by law (13.487/2017) [15] in 2017. Constituted by public money, it should be distributed to political parties only in electoral years. In 2018, its total value was around 1,7 billion reais with distribution criteria established by resolution (23.568/2018) [16]. It can be summarized as follows:

i 2%, equally divided between all registered parties;

ii 35%, divided between parties with at least one representative on the Chamber of Deputies, in proportion to the percentage of votes obtained by the party on the last elections for the Chamber of Deputies;

iii 48%, divided between parties, in proportion to the number of representatives in the Chamber of Deputies, considering the party of the incumbents; and

iv 15%, divided between parties in proportion to the number of representatives in the Senate, considering the incumbents' party. (open translation)

Furthermore, political parties also receive money monthly from the Party Fund, created by the 1988 Federal Constitution to strengthen political parties and promote their financial autonomy. It is financed by both public money, electoral fines, donations, and others, with an estimated value of over 500 million reais in 2018. As for its distribution criteria, law (11.459/2007) [17] established that:

i 5%, distributed, in equal parts, to all parties registered in the Superior Electoral Court;

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[13] http://www.tse.jus.br/legislacao-tse/res/2015/RES234632015.html

[14] http://www.planalto.gov.br/ccivil_03/leis/L8713.htmart35

[15] http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2017/lei/l13487.htm

[16] http://www.tse.jus.br/legislacao-tse/res/2018/RES235682018.html

[17] http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm

ii 95% distributed between parties in proportion to the votes obtained by the party on the last elections for the Chamber of Deputies;

Regarding how parties should allocate the funds between their candidates, party leaders have had a considerable degree of freedom to decide. In 2015, amidst the mini-reform responsible for ending the possibility of corporate donations, however, a constraint was imposed regarding the financing of female candidacies. The National Congress stated, through the law (13.165/2015) [18], that parties had to reserve a minimum of 5% and a maximum of 15% of resources from the party fund to finance women's campaigns in the three following elections (2016, 2018 and 2020). Considering, as previously detailed in section 2.1, that gender quotas require political parties and coalitions to present a minimum of 30% of female candidacies, setting a ceiling of half that percentage was a highly controversial measure.

Although the measure was valid for the 2016 elections, in 2018 the Brazilian Supreme Court (STF) overturned, by a majority, the limit of 15% set in 2015. Moreover, it decided that at least 30% of the money from the party fund should be directed to women's campaign, in conformity with the quota legislation. A few months later, the Superior Electoral Court (TSE) ruled that the money received from the electoral fund should also have at least 30% of its total amount transferred to women candidates. In both cases, if the party has more than 30% of female candidates, the transfers should be proportional. Even though the new funding legislation is linked to the electoral quota law, there is an essential difference. While the former is restricted to proportional election positions, the Supreme Court ruled that the latter could encompass both proportional and majority election candidacies (FGV, 2019). It is worth noting that other than donations for female governor and senator candidates, the money given to female governor vice candidates and senator substitutes is also considered money given to female candidates, even when the official candidate for the position is male.

Additionally, candidates also face limits regarding how much money they can raise. For the 2014 elections, resolution (23.406) [19] stated that the Superior electoral court had until June 10th to fix limits for each position in dispute, according to the law (9.504/97). Because by that day no legislation in this regard had been approved, parties became responsible for informing the maximum they would spend in each position for that year's election. In 2018, however, the law (13.488/2017)[20] placed ceilings on campaign expenditures, which varied by the position and state the candidate ran for. This measure had the potential of making elections more democratic by curbing the power of wealthy donors. In fact, however, limits were far too high to fulfill that purpose (Sacchet, 2018).

In conclusion, in recent years, Brazil's political conjuncture has led to the extinction

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[18] http://www.planalto.gov.br/ccivil$_0$3/$_a$to2015 − 2018/2015/lei/l13165.htm

[19] https://www.tse.jus.br/eleicoes/eleicoes-anteriores/eleicoes-2014/normas-e-decisoes/normas-e-documentacoes/resolucao-no-23.406

[20] https://www.tse.jus.br/eleicoes/eleicoes-2018/prestacao-de-contas-1/limites-de-gastos-por-cargo-eletivo-das-eleicoes-2018

of one of the most traditional forms of campaign finance. On the other hand, a new fund was created with public money, and the Superior Electoral Court determined a minimum of its total value – in conformity with what the Supreme Court determined for the party fund – that should be directed to female candidates. So far, there has only been one election under these new rules - in 2018. Also, candidates have to respect limits on the amount they can receive depending on the position and state they run for. The next session will provide more details on the financing of candidacies over the 2014 and 2018 elections.

3 Data

The analysis is based on data from the Superior Electoral Court's data repository (TSE). This repository is a rich source, containing multiple databases with up-to-date information ranging from 2002 to 2018 [21]. For the purposes of this research, I use the candidate's database besides data on candidates' electoral accounts [22] and the votes received by municipality and electoral zone. Regarding the year of 2018, which contains the most complete, up to date available information, all the referring data sets were used. For the period ranging from 1998 to 2016, [23] data collected refers mostly to the candidate's database and votes received. Overall, 2014 and 2018 are the most relevant electoral years for this study. To enable comparing the currency in 2014 and 2018, 2014 prices were deflated using IPCA - Amplified Consumer Price Index - annual data from The Institute for Applied Economic Research (Ipea). From here on, every time 2014 values are mentioned, they are adjusted for inflation.

As complete as this data source might be, it is necessary to make a couple of considerations regarding candidate's electoral accounts. First, as previously mentioned, the Lava Jato operation uncovered multiple corruption schemes involving illegal money and political parties. Other than the declared revenues candidates present to the Superior Electoral Court, they might have received undeclared illegal money. Despite the end of the possibility of corporate donations in 2015, there is evidence that illegal, undeclared money still financed candidates in the 2018 elections. Therefore, we use the data as a proxy of the actual amount received by each candidate.

Second, although the Brazilian electoral legislation requires all candidates to report their revenues to the Superior Electoral Court, not all do. If the candidate is not elected and does not wish to run as a candidate again, then he/she does not suffer any further sanctions for not reporting. On the other hand, all elected candidates, and the unelected that wish to run again, need to report. Otherwise, they will not receive the certificate of electoral discharge and therefore will not be able to assume their positions – or to run again, in the case of the unelected. For this reason, there is a gap in data for a portion of candidates in each election.

Next, this section will describe the process of variable construction used in this study detailing the variables used. Afterward, it presents a descriptive analysis both at the party and the candidate level. The information conveyed in this section not only complements the empirical strategy applied later but also brings another range of information that allows for a better understanding of the studied situation. The section ends with a table of summary statistics.

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[21] Data from previous periods is under revision, according to the website: http://www.tse.jus.br/eleicoes/estatisticas/repositorio-de-dados-eleitorais-1/repositorio-de-dados-eleitorais

[22] As in (Carazza, 2018), I choose to work with fundraising data rather than expenditures data, as they seem to be very similar regarding total values.

[23] Elections starting in 1998 up to 2018 with a 4-year gap represent state and federal elections. On the other hand, the ones starting in 2000 correspond to municipal elections as well as state (for the Senate, there is 1/3 and 2/3 of renovation each electoral period).

3.1   Variable Construction

Family Family politics is very present in Brazil, with the presence of political dynasties found to be negatively correlated with local development outcomes (Ferraz and Finan, 2009). In 2014, the Brazilian NGO Transparencia Brasil published a report with the estimated number of politicians elected that year that had relatives in politics. They found that 49% of elected federal deputies fell under this category, and the number was higher for women, 55% of which had some relative in the political field. Only one female governor was elected that year, and she was married to a former federal deputy. Furthermore, out of the seven female vice-governors elected, all had some relative in politics. Identifying these candidates, especially the women, is thus very relevant when studying funding distribution among candidates.

One common approach used for this matter in the Literature is to try to match candidates by their surnames, as is the case in (Bragança et al., 2015). However, this strategy has noteworthy drawbacks: First, having the same surname does not necessarily mean that people belong to the same family (even controlling for the most common surnames, this is still a relevant question). Second, there is the issue of typos in the database which make matching more difficult.

With this in mind, I employ a strategy that has never been used for this purpose, to the best of my knowledge. Using web scraping, I construct a function based on two hypotheses: 1) all women with some relative in politics would want this information to be made public for their benefit; 2) most well-known candidates have a page in the popular Website Wikipedia. [24] The function receives as input female candidate names and searches for them on the Wikipedia website. If it finds a page, then the function searches its content looking for keywords that indicate that the woman has some relative in politics. To this end, I created a word database containing multiple combinations of possible words for some of the closest possible family relationships a female candidate might have (husband, father, mother, cousin, brother). Moreover, I used regular expressions to allow for differences in text construction, as relatives' presence might be phrased differently. For the matching process, I use the candidate's name as well as their ballot name. Both names are used because there are typos in the database that impair the matching process and also due to the costume of candidates adding prefixes/suffixes to their ballot names, making it harder to find matches.

To give an example of this procedure, I present in Figure 5 the Wikipedia page for Lúcia Vânia, senator candidate in the 2018 elections. I search for her webpage using her ballot name and adding "_" between words as the page URL does not accept blank spaces. Once the function detects her page, I find four occurrences that denote relatives in politics in her bio description. They appear in red boxes in the figure and denote that she had a husband, a brother, a cousin and a nephew [25] in politics. After applying this procedure for all female candidates in the 2018

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[24] This assumption probably won't hold for Municipal Elections, considering most of Brazilian municipalities are small - Out of the 5570 brazilian municipalities, only 154 have more than 200.000 inhabitants

[25] I do not account for nephews on my function.

and 2014 elections, I checked each of the found matches to verify the function's accuracy. This enabled me to create a variable "family" that equals to 1 if the candidate has any family in politics.

Figure 5 – Example of candidate with relatives in politics Wikipedia page

Electoral History Another important variable is the mapping of candidates' electoral history. Despite one variable that indicates whether the candidate is running for reelection and one for the candidates' declared occupation - which could be a previously held political position or his occupation before entering politics - there is no indication of his/hers electoral history in the database. In order to differentiate between types of candidacies, it's relevant to distinguish between the three kinds previously mentioned: 1) Ever Elected candidates, that have run, and won at least once, before the current election; 2) Ever Candidates, that have run, but never won, before the current election; 3) Outsider candidates, that never competed before.

To enable this , I gather data from elections since 1998 up to 2018 and perform a fuzzy merge. Merging only by the candidates' name would be problematic due to the typos [26] described before, so I employ a more flexible approach based on the fuzzy merge function [27]. For each observation in dataset one, it finds the closest row in the second dataset within a predefined distance, which is a weighted average of string distances. I do this for all candidates in 2018, searching for matches by state in each and every of the years previously mentioned and removing

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[26] Additionally, some candidates present themselves with different names in each election. They often choose to add or remove one of their surnames.

[27] fuzzy_join, from R's package fuzzyjoin.

matches who don't share the same first letter on the first name. However, even controlling for this, there are problems such as the matching of names that don't correspond to the same individual. Aiming to fix this, I develop a score for each matched observation and use it to filter the matches. The score is composed as follows:

$$Score = 2 * Exact\_match + Muni\_of\_birth + Birthday$$

Where exact match corresponds to a full match between the names, Muni of Birth corresponds to being born in the same municipality and Birthday corresponds to the candidate's birthday. [28]. Since Exact match matters twice as the other variables, the biggest possible score is 4 (and the smallest, 0). I consider a match to be real when the score is 3 or higher, or when both Muni of Birth and Birthday are a perfect match.

"Laranja" Candidacies The so-called "Laranja" candidacies were a much-discussed topic in the past elections, with the unravelling of the scandal involving the PSL party. In one of the most emblematic cases, the federal deputy candidate from PSL Lourdes Paixão received R$400 thousand reais from the Party Fund approximately a week before election day but obtained mere 274 votes. However, as formerly described in the previous section, this scheme regarding female candidacies goes back to previous elections, at least since the 2009 mini-reform, as parties attempted to nominally comply with the established gender quotas.

There is no precise way to determine which candidacy is "Laranja". In the past, candidates with scant funding were already a red flag for this type of fraud. Additionally, there was a significant number of candidates receiving 0 votes. On the other hand, with the new legislation regarding funds distribution, receiving money is no longer a good proxy for a competitive candidacy. Cases such as that of Lourdes Paixão show that parties have a new way of circumventing the law, distributing resources for female candidates that will be used to finance male contestants - thus maintaining the status quo. Besides, not only candidates receiving 0 votes can be "Laranjas".

To give a dimension of this phenomenon, I use Malu Gatto and Kirstin Wylie's criteria to spot this type of fraud in the 2014 and 2018 elections for federal and state deputies. The rule is, a federal (state) deputy candidate from a given state is classified as "Laranja" if he/she gets less than 1% of the votes received by the least voted elected federal (state) deputy in that state.

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[28] These two last variables may suffer from the same typo errors as the names and that's why I use both, and not only one of them, despite being fixed characteristics.

All Variables In short, the used variables are:

FAM - Represents if the candidate has a relative in politics;

LARANJA - Represents if the candidate can be considered "LARANJA";

EVER ELECTED - Represents if the candidate has been elected before current elections;

EVER CANDIDATE - Represents if the candidate has run, but never won, before current elections;

OUTSIDER - Represents a candidate that prior to 2018 never won nor run for any political position;

PARTY - Represents political parties acronym;

SG_UF - Represents each brazilian State;

SQ_CAND - Numerical sequence that uniquely identify each candidate in a election she/he is running for;

YEAR - Represents the electoral year;

POSITION - Refers to the position the candidate is running for;

SIT_CAND - Represents the candidates' registry situation. May be "apt" or "inapt";

DS_GEN - Represents the gender of the candidate;

RACE - Represents the race self-declared by the candidate;

OCUPATION - Represents the candidate declared occupation;

SCHOOLING - Represents the self-declared last level of education reached by the candidate;

MARITAL_STATUS - Represents the candidate Marital Status;

DS_SIT - Represents the election result (elected x not elected) for each candidate;

FUND - Represents each candidate declared received funding;

VOTES - Represents the votes received by the candidate;

3.2 Descriptive Analysis

Party Level Statistics

Fund Distribution As previously described, parties faced a significant restriction regarding funds distribution in the 2018 elections. It became mandatory for them to direct at least 30% of the money to women candidates - both from the Party and the Electoral Fund. However, the law did not specify how this process should occur, giving party leaders autonomy to decide how to allocate the required amount. Due to this gap in regulation, there were three potential scenarios regarding how to distribute the money:

1 **First scenario:** The 30% could all go to women candidates in proportional elections - which in 2018 referred to federal, state, and district deputies. It is important to recall that due to the quota law at least 30% of candidate lists should be filled with women candidates for these positions.

2 **Second scenario:** Adding to the previous scenario, the 30% could be distributed between proportional and also majority positions with candidacies headed by women - Senators or Governors.

3 **Third scenario:** Finally, the 30% could be distributed between proportional and majority positions including not only those headed by women, but also positions headed by men with a female vice candidate in, the governor case, or substitute, in the senator's case[29].

Overall, this last scenario allows candidacies headed by men to receive money that accounts for the 30% reserved for women in the elections. Whatever the odds that an elected man will leave office are, the likelihood that both the man and the first substitute (in the senators' case) will need to step down, so that the second substitute takes place, is assuredly lower. This raises concerns that the money spent is not helping improve women's representation.

Figures 6 and 7 below show how much parties spent on female candidacies based on each of these scenarios. Two basic facts become clear: First, some parties did not comply with the legislation even under the third, more flexible scenario. This happened more often for the Party Fund, whereas for the Electoral Fund only three parties did not comply in any scenario (PDT, Avante, and PRP). Second, parties differed in their spending patterns between scenarios. For example, looking at Figure 6, REDE spent less than 10% of their Party Fund under the first scenario. Nonetheless, when adding majority candidates (along with vices and substitutes) into consideration, the party jumps to being the third that spent more with female candidacies, with more than 60%.

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[29] Governors have one vice candidate that will take their place in office if they have to leave it. Senators, on the other hand, have two substitutes. Both vice and substitutes are chosen prior to the elections, competing alongside the position's heads.

Figure 6 – Percentage of the money from the party fund directed to female candidates, by party and scenario
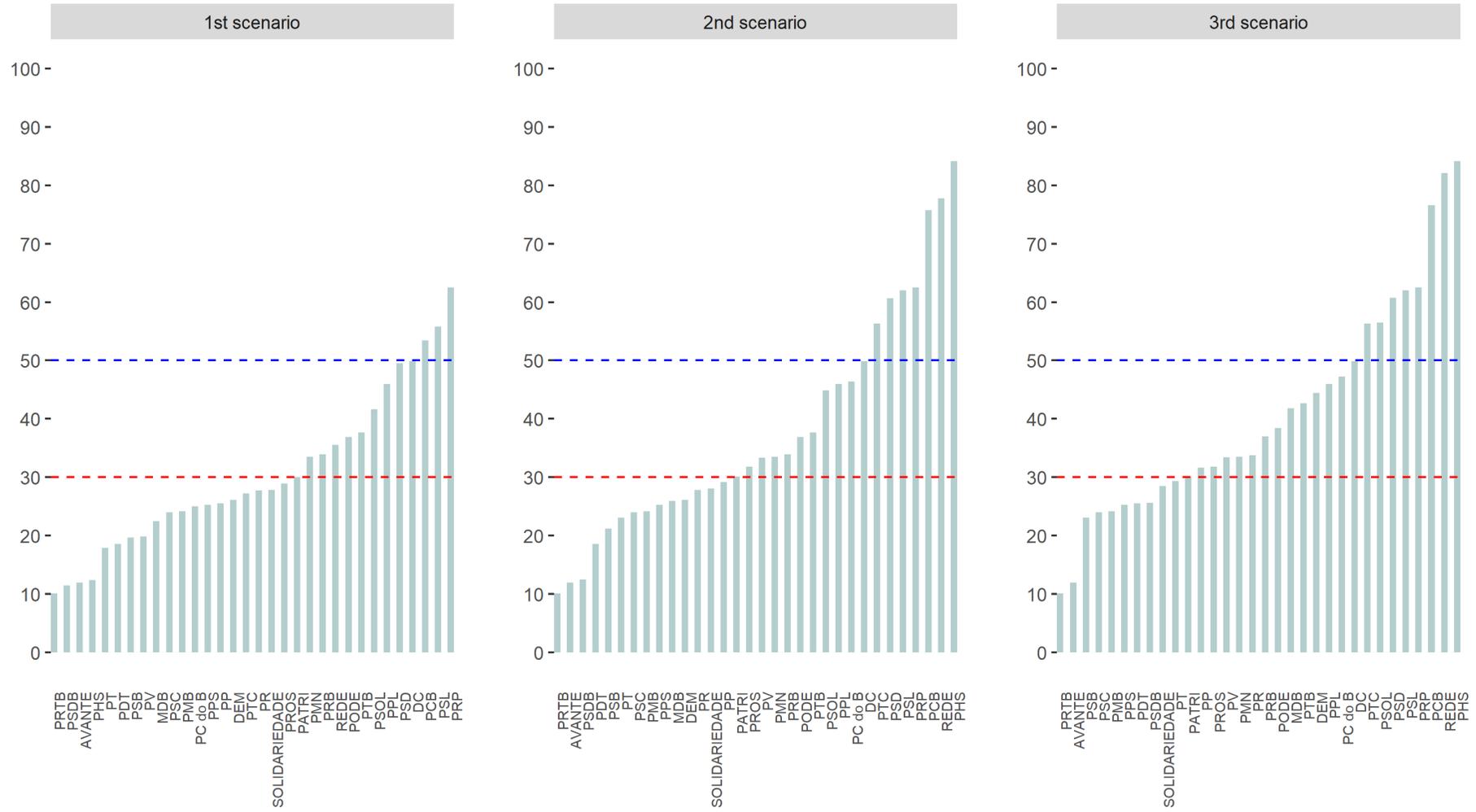
Data: Electoral Data Repository, TSE

Figure 7 – Percentage of the money from the electoral fund directed to female candidates, by party and scenario
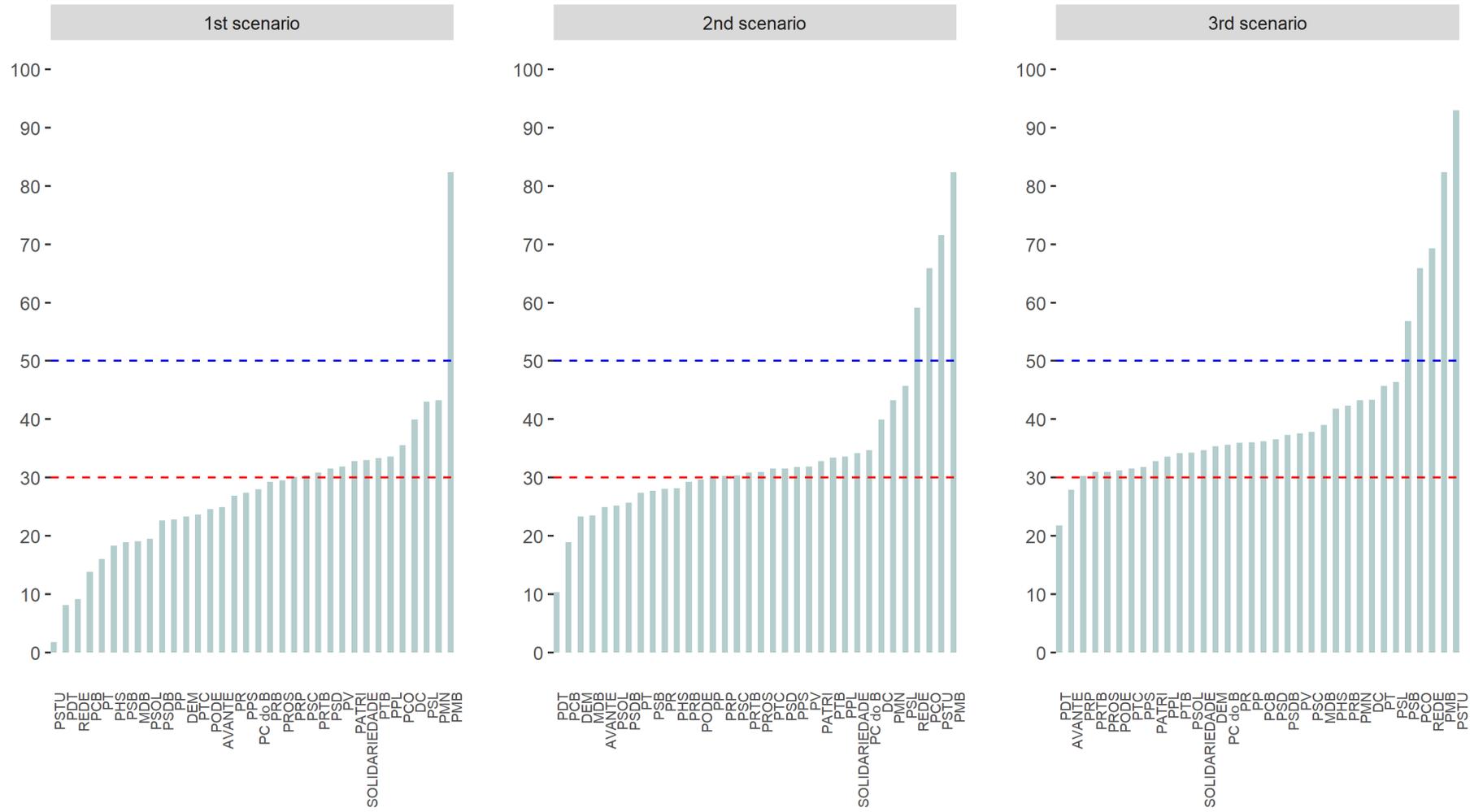
Data: Electoral Data Repository, TSE

Whereas this analysis of which parties respected the cut-off under each possible scenario is unquestionably relevant, it does not show the whole picture. In order to deepen the examination, I provide more details on the way each party distributed money from the Party Fund and the Electoral Fund in Table 1. To make things easier, I sum up the money spent by each party from both funds. Parties appear ordered from highest to lowest according to column (2).

The Table shows a clear contrast between columns (2) and (3), as those parties that presented a more equitable fund distribution pattern across genders are those who received considerably fewer resources from the Electoral Fund. Conversely, parties receiving the highest share appear at the bottom as those with more unbalanced fund distribution between sexes. Further, being among the parties that distributed more to women does not imply that the distribution was equitable between them. For instance, in the top five political parties with the highest share of funds donated to female candidates, two of them invested more than two-thirds of the resources in only one female candidate - the one running for presidency. Finally, column (4) appears to be negatively correlated with column (5), meaning that those parties that concentrated their resources on a handful of female candidates did so at the expense of leaving others with no funding from public funds whatsoever. Column (4) should be interpreted with caution, however, since political parties may donate money to candidates labelled as coming from "other sources" which are not accounted for the purposes of this table. Therefore, the numbers in column (4) sub-estimate the actual share of women receiving funds from the party.

Overall this examination at the party level shows a flagrant contrast between the amount of public money a political party receives and the share they allocate to women candidates. The fact that those parties receiving the highest shares of public money seem to be the ones least concerned with fixing the gender gap in politics should be considered a red flag and addressed appropriately.

Table 1 – Public funds distribution patterns by Political party, 2018

Political Parties	% Funds to women	% Electoral Fund	% Women that receive	%Resource concentration nº1	Position
PMB	72,09	0,045	21,94	61,98	Federal Deputy
PSTU	70,84	0,0481	12,33	76,85	President
PCO	65,86	0,0014	83,33	12,37	Governor
REDE	61,22	0,5906	79,83	78,81	President
PSL	49,07	0,5718	55,75	8,37	Federal Deputy
DC	41,13	0,2033	85,2	7,84	State Deputy
PMN	39,47	0,3056	15,66	28,19	Federal Deputy
PRP	36,25	0,352	59,11	22,55	State Deputy
PC do B	35,61	1,5651	54,12	16,14	Senator
PTC	35,37	0,3349	37,02	22,96	Federal Deputy
PPL	35,28	0,0482	56,95	19,2	State Deputy
PSD	35,09	6,0019	84,38	3,06	Federal Deputy
PTB	33,85	3,1679	86,22	10,63	Federal Deputy
SOLIDARIEDADE	33,28	2,2575	94,62	9,38	Federal Deputy
PV	32,08	1,2331	85,87	13,51	Federal Deputy
PATRI	31,98	0,5824	60,62	7,82	Federal Deputy
PPS	31,7	1,4236	80,75	13,66	Senator
PRB	31,39	5,9948	94,94	6,26	Federal Deputy
PROS	31,31	2,3147	50,33	11,9	Federal Deputy
PODE	30,53	1,8103	52,7	17,84	Federal Deputy
PHS	30,27	0,7999	79,78	18,06	Senator
PCB	30,11	0,0858	79,17	21,07	Federal Deputy
PP	29,94	9,5411	88,1	13,36	Governor
PRTB	29,56	0,1278	66,14	23,37	State Deputy
PSC	29,56	1,8657	66,8	20,26	Federal Deputy
PR	27,95	10,3886	90,34	4,05	Federal Deputy
PT	27,25	9,5026	86,65	9,96	Governor
PSB	27,13	6,162	79,7	11,08	Senator
PSOL	25,49	0,9707	83,1	5,86	Federal Deputy
DEM	23,89	5,3387	61,83	7,49	Federal Deputy
PSDB	23,88	10,3301	88,03	6,89	Senator
MDB	23,76	12,1011	91,18	13,52	Governor
AVANTE	21,24	0,7147	53,7	16,07	Federal Deputy
PDT	11,39	3,219	88,59	17,22	Senator

Notes: Column (2) shows the percentage of the money donated to female-led candidacies - candidates for state, federal or district deputy, senator, and governor - out of the total amount of Party Fund and Electoral Fund money used by political parties to finance candidacies. Column (3) shows how much of the Electoral Fund went to each political party in 2018. Column (4) shows the percentage of women candidates receiving money from one of these funds donated by their political parties out of the total amount of women candidates running for that party. Column (5) shows the share of public funds received by the female candidate receiving the highest total donation in the party. Column (6) presents what position this candidate ran for.

Candidate Level Statistics

Funding Money donated to candidates may come from various origins. The most common ones are self-funding, political parties, individuals, corporate and donations from other candidates. Between 2014 and 2018, however, important changes occurred in this regard. The biggest of all was the end of corporate donations, but there were others as well. For instance, in 2014 parties were allowed to form, up to ten days after choosing their candidates, a financial committee [30] (or

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[30] https://www.tse.jus.br/eleicoes/eleicoes-anteriores/eleicoes-2014/normas-e-decisoes/normas-e-documentacoes/resolucao-no-23.406

more than one) that would also be able to distribute money to candidates. [31] The committees were considered illegitimate and ceased to exist by the 2018 elections. Here I will present in Tables 2 and 3 general statistics describing the origins of the funding of female candidacies in 2014 and 2018. In 2014, the relevance of corporate donations is evident in its high mean and median values. In 2018, however, party resources take the lead becoming possibly the most important source of funding.

Table 2 – 2014 Funding sources

Funding Type	Other candidates/ committees	Party	Own Resources	Individuals	Corporate
Mean	1,625	9,860	5,108	1,346	11,262
SD	8,757	54,593	19,539	5,274	30,991
Median	234	524	789	468	1,754
Total	28,638,765	69,031,494	19,914,706	29,083,652	38,697,784

Table 3 – 2018 Funding sources

Funding Type	Other candidates	Party	Own Resources	Individuals	Collective
Mean	2,363	23,225	7,291	2,303	1,651
SD	10,501	116,305	30,631	10,250	3,132
Median	467	1,200	1,000	1,000	723
Total	29,426,290	577,178,677	28,900,195	58,207,897	2,255,176

Family With regards to finding female candidates with family in politics, the procedure previously described uncovered far fewer observations than the number encountered by the NGO Transparencia Brasil. This could be for several reasons: First, some candidates may have relatives in politics despite not having a Wikipedia page. Second, the function could be missing some Wikipedia pages due to the typos and fake ballot names. Finally, it could be failing to catch patterns not yet included in the function. There is plenty of room for improving the function so that the second and third problems can be addressed appropriately, and I am confident that future versions of it will find more results. Nevertheless, I present in Table 4 descriptive data regarding the 43 matches found in the database.

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[31] In TSE's database however, this money appears coupled in the same category as money donated by other candidates. The distinction can be done using other columns with further information on the donations.

Table 4 – Family politicians statistics

	2014		2018	
	N	Mean	N	Mean
White	22	.77	21	.86
Married	22	.55	21	.62
Age	22	50	21	52.38
High School	22	.09	21	0
College	22	.86	21	.9
Outsider	22	.18	21	.24
Elected Before	22	.73	21	.71
Elected	22	.64	21	.38
Federal Deputy	22	.73	21	.62
Governor	22	.09	21	.19
Senator	22	.18	21	.19
Number of Votes	22	195891.64	21	241358.24
Funding	22	1414541.28	21	2124471.96

The Table shows that, on average, female candidates with family in politics are white, married, older, hold a college degree and have been elected before. Moreover, 64% of them got elected in 2014 compared to 38% in 2018. Most of them ran for the position of Federal Deputy. Concerning the party these candidates ran for, the 43 matches were distributed between 14 parties. Those who had more than one candidate with family in politics were PC do B, PP, PR, PSB (the party of Lucia Vania, the candidate used as an example in Figure X), PSDB, PSL, PT,PTB and MDB. MDB had the most candidates, with 8 female candidates found to have relatives in politics.

Vice and Substitute Candidates Other than running as heads, women can also appear in elections as vice candidates for Governors and substitutes for Senators in state elections. This kind of candidacy received new electoral importance as money distributed to candidacies with women running as vice and substitutes counts for the 30% minimum required by law.

In this regard, Tables 5 and 6 show how parties allocated men and women for these positions in the 2014 and 2018 elections. It can be seen that in both cases the relative frequency of candidacies headed by males with female vices/substitutes rose substantially. Interestingly, in the senators' case the number of candidacies with female 1st/2nd substitutes headed by a male candidate grew more than the number of candidacies headed by women with men as 1st/2nd substitutes. Additionally, in the governors' case, the number of all-male candidacies dropped to almost one-quarter of the respective number observed in 2014.

Figures 8 and 9 provide a deeper understanding of the phenomenon observed in both electoral cycles. First, they show that in 2018 there were fewer outliers representing candidates with disproportionately high funding. Besides, it is worth-mentioning that in the Senator's case funding for male headed candidacies with at least one female substitute rose significantly between years and had the highest median in 2018, between the observed categories. In fact, the two-sided

Table 5 – Governor Candidates by sex

Governor Candidate	Vice Candidate	Relative Freq, 2014	Relative Freq, 2018
Female	Female	2.31%	2.19%
Female	Male	9.25%	13.11%
Male	Female	24.28%	48.63%
Male	Male	64.16%	36.07%

Wilcoxon Rank-Sum Test for this category had p-value of 0.01069 which supports the visual evidence that the median funding of male headed candidacies with at least one female substitute in 2014 is significantly different from that of 2018.

This information, coupled with that conveyed in Figures 6 and 7, suggests that some parties chose women as substitutes (and vices) for male candidates in order to satisfy law requirements. While there might be some anecdotal evidence supporting that running as a vice candidate can help build political capital and thus increase chances of being elected in forthcoming elections, it may not be the case. This constitutes a possible path for future research.

Figure 8 – Governors candidacies by type, Thousand R$
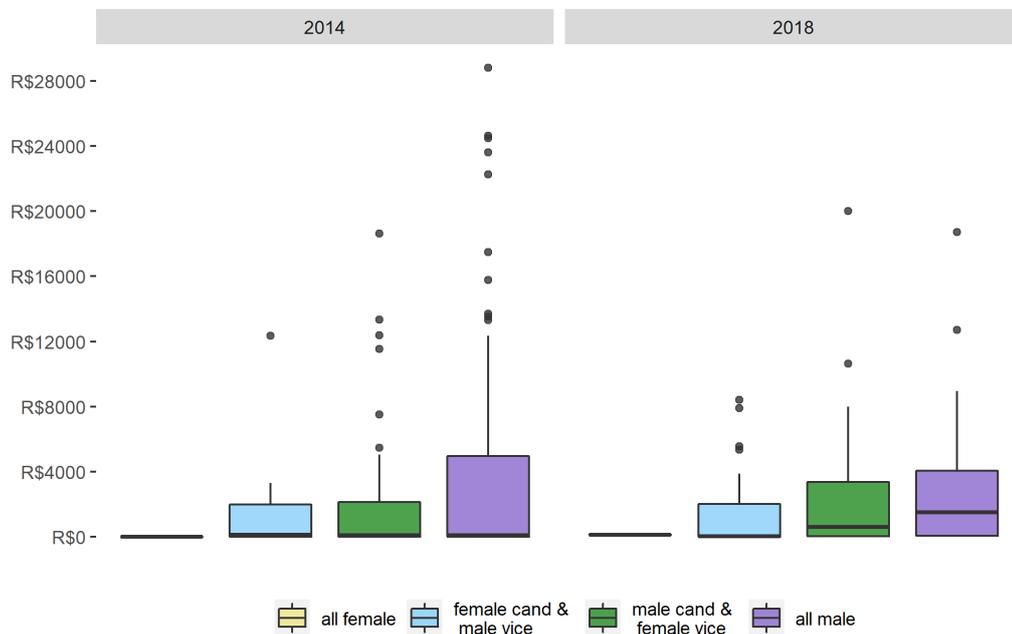
Table 6 – Senator Candidates by sex

Senator Candidate	1st Substitute	2nd Substitute	Relative Freq, 2014	Relative Freq, 2018
Female	Female	Female	0	2.57%
Female	Female	Male	3.66%	1.61%
Female	Male	Female	3.05%	4.18%
Female	Male	Male	14.02%	9.97%
Male	Female	Female	3.66%	5.79%
Male	Female	Male	14.63%	15.43%
Male	Male	Female	10.37%	18.01%
Male	Male	Male	50.61%	42.44%

Figure 9 – Senators candidacies by type, Thousand R$
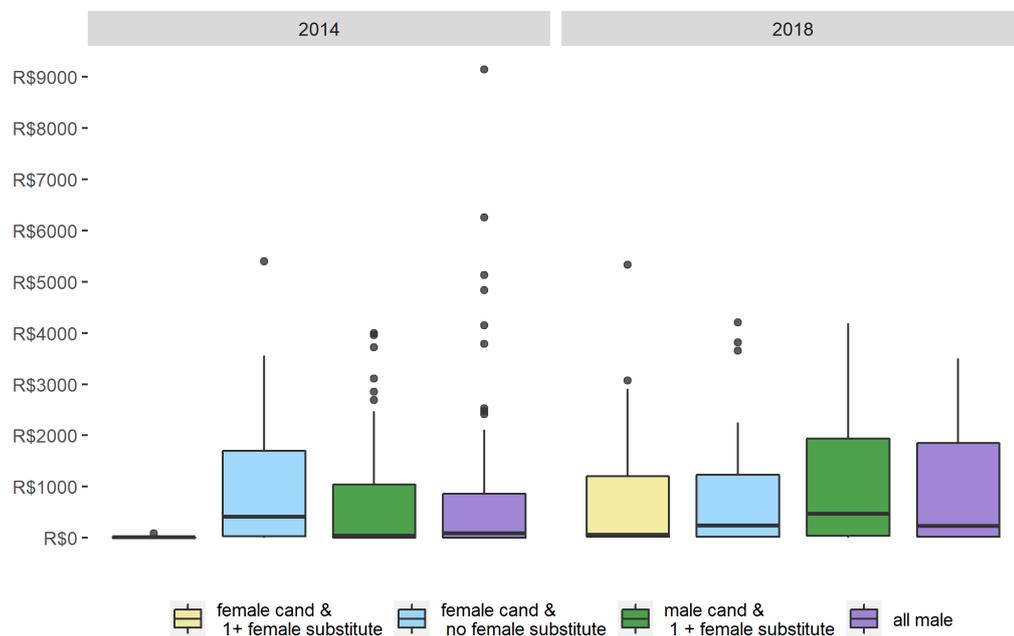
"Laranja" Candidacies With regards to this type of candidacies, Table 7 shows the prevalence of a high number of "Laranja" female candidacies in the pool for Federal and State deputies. It can be seen that in both cases the numbers suffered a discrete decrease between electoral years. This could be for several reasons. First, the obligation to distribute money to female candidates might have raised the cost of appointing non-competitive contestants, especially since the 2017 constitutional amendment added a barrier clause that restricted access to the Party Fund based on party performance. Second, its distribution criteria between parties depends heavily upon the number of votes obtained on elections for the Chamber of Deputies. Finally, parties could be responding to an increase in punishment regarding the use of Laranja candidates. After the 2016 municipal elections, the Electoral Superior Court (TSE) decided to overturn the mandate of elected city councilors due to the existence of fraudulent female candidacies in the same party list. This decision was made for the first time in the municipality of Santa Rosa do Viterbo (São Paulo). When proven that "Laranja" candidates were used, the court declared that the whole coalition should be deposed and the ones considered responsible for the fraud became

ineligible.[32]. However, decisions like this are still rare.

Table 7 – "Laranja" Candidacies

Position	2014	2018	Perc. Variation
Federal Deputy	831	761	-8,42%
State Deputy	1830	1614	-11,80%

Figure 10 gives a little more insight regarding what happened between both elections with these types of candidacies. Despite the decrease in absolute numbers, it can be seen that the funding received by "Laranja" female candidates increased substantially in 2018, even for candidates that received close to 0 votes. This indicates a shift in the pattern of "Laranja" candidacies used by parties. With the new laws regarding fund distribution, it became necessary to at least nominally allocate more money to female candidacies. Under the covers, however, part of the money was often used to support male candidates.

Figure 10 – Estimated "Laranja" candidates in 2014 and 2018, Thousand R$
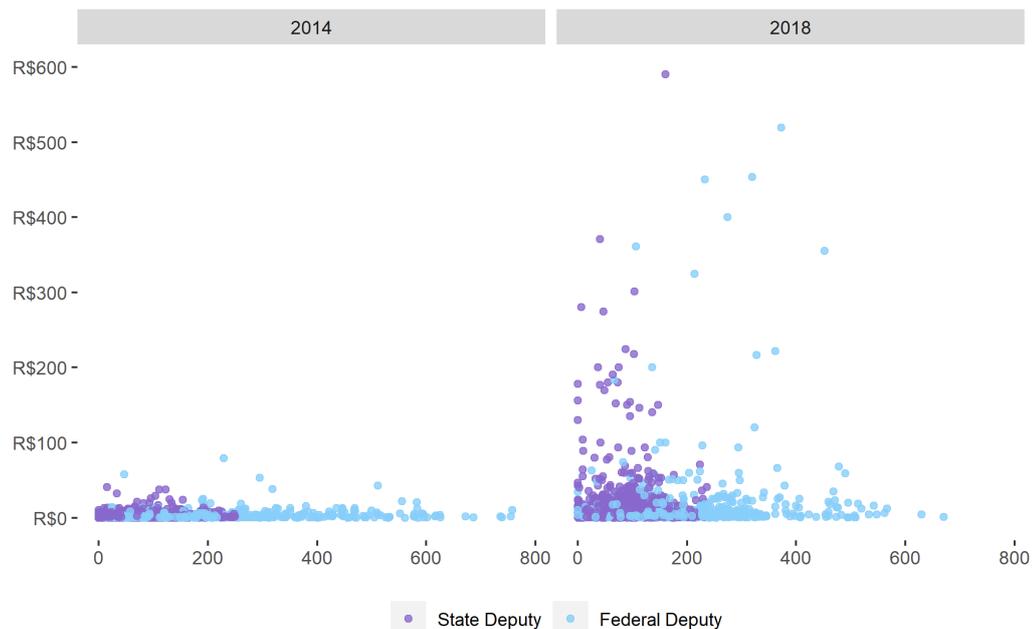
Finally, Table 8 summarizes some key variables according to the election year (2014/2018). The first panel of the table shows general information about candidate's characteristics. The second panel brings data on their educational background. The third shows variables regarding female candidates types and performance. Number of votes is the total amount of votes received in the first round of elections and Funding refers to everything declared by candidates as received financial resources.

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[32] https://www1.folha.uol.com.br/poder/2017/09/1918974-justica-aperta-o-cerco-e-pune-candidatas-"Laranja"-como-fraude.shtml

Table 8 – Summary Statistics

| | 2014 | | 2018 | | | |
	N	Mean	N	Mean	*Difference*	*P-value*
General						
White	5935	.54	7541	.52	-.02	.02
Married	5935	.41	7541	.4	-.01	.5
Age	5935	45.56	7541	46.17	.61	0
Education						
Primary Education	5935	.07	7541	.05	-.02	0
High School	5935	.33	7541	.32	-.02	.06
College	5935	.42	7541	.46	.05	0
Political Career						
Outsider	5935	.56	7541	.68	.12	0
Elected Before	5935	.08	7541	.07	-.01	.01
Elected	5935	.03	7541	.03	0	.22
Number of Votes	5935	5011.90	7527	8407.03	3395.13	.02
Funding	4475	40745.69	6847	99596.16	58850.47	0

Notes: Table refers to female candidates in the 2014 and 2018 elections running female-led candidacies.

4   Empirical Strategy

I aim to determine how female candidates' funding changed in the 2018 elections after parties became obliged by law to distribute at least 30% of the Party Fund and the Electoral Fund to women, based on the two questions described below.

1 **How the money was distributed between different types of female candidacies.**

2 **How parties' funding distribution pattern in 2014 influenced female candidates available funding in 2018.**

This section will detail how I intend to empirically answer each of them, using variables from the Variable Construction Section in chapter 3. Also, I focus on state elections as the run for the presidency has a scant number of contestants and is probably different in many aspects from state contests. Therefore presidential candidates are removed from the analysis. Finally, only female candidates are considered.

4.1   Multi-Way Fixed Effects

First, I generate a pooled cross-section dataset with observations regarding all apt [33] female candidates running in the 2018 and/or 2014 elections. To assess whether funding for different types of female candidacies changed in 2018 under the new legislation, I employ a multi-way fixed effects approach. Candidates are divided into three categories: Ever Elected, Ever Candidate, and Outsider - the omitted category in the model, therefore the comparison group. This division is constructed based on the assumption that previously elected female candidates hold an advantage regarding the fundraising of their campaigns. Furthermore, candidates who ran but never won before may refer to recurring candidacies that receive little or no support from political parties (even if not a case of a "Laranja" candidacy). Thus, the distribution pattern for outsider candidates will likely render interesting comparisons that will help understand how parties chose to allocate funds in 2018. To do so, I estimate regressions based on the following model:

$$log(Y)_{ijklm} = \beta_0 + \beta_1 * Year_l + \beta_2 * EverElected_{ijklm} + \beta_3 * (EverElected_{ijklm} * Year_l) +$$
$$\beta_4 * EverCandidate_{ijklm} + \beta_5 * (EverCandidate_{ijklm} * Year_l) + X'_{ijklm} * \phi + \alpha_j + \gamma_k + \theta_m + \varepsilon_{ijklm}$$
$$(1)$$

The estimation will follow three distinct specifications, varying the dependent variable Y. First it will represent the sum of public funds received by candidate i from political parties. After,

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[33]   All potential candidates cleared by the electoral justice.

it will denote the sum of all party distributed funds (including, but not restricted to, public funds) received by candidate i. Finally, it will signify the sum of all the funds (public and private) [34] received by candidate i. As discussed in the Data section, party funds could also come from financial committees in 2014. To address this, in the Robustness section I check if results hold when adding this source. All estimates refer to candidate i, from party j, running for position k, in year l and state m. X' is a vector of time-variant candidate observable characteristics. Those are age, and indicators for being married, white, holding a college degree, being classified as "Laranja", and having a relative in politics. I include party, position, and state fixed effects to account for time-invariant characteristics correlated with the outcome and year fixed effects to account for time trends. The identifying assumption here is that the model controls for both observed and unobserved characteristics that may confound the estimates with the use of fixed effects and controls. Statistics are robust to heteroskedasticity, and standard errors are clustered at the party level. The main coefficients of interest are β3 and β5, as they will show whether the funding of Ever Elected and Ever Candidate changed significantly more or less than the funding of Outsider candidates in each of the three potential outcomes.

4.2   Differences-in-Differences

Afterward I create a panel dataset with female candidates that ran for both the 2014 and 2018 elections, regardless of the party or the position they ran for each time. To understand how parties resource distribution patterns in 2014 influenced their allocation in 2018, I employ a differences-in-differences framework. Treatment is defined as 30 minus the percentage of all the money given by parties that went to female candidates (including, but not restricted to, public funds) in 2014. Hence the treatment variable is continuous and may vary from 0 to 30, representing respectively parties that gave more than 30% to women in 2014 and parties that did not give anything to them. Parties with treatment status equal to 0 are considered controls. In theory, they would need less effort to redistribute resources in 2018 after the new legislation made it mandatory to give 30% of public funds to women. Table 15 in the appendix shows the treatment value for each party, as well as their treatment status and the number of female contestants included in the diff-in-diff by year. Parties that were created after 2014 or that ceased to exist after 2014 were discarded from the analysis. Regressions are based on the following model:

$$log(Y)_{ijklm} = \beta_0 + \beta_1 * Year_l + \beta_2 * Treatment_j + \beta_3 * (Year_l * Treatment_j) +$$
$$\lambda_i + \gamma_k + \theta_m + \varepsilon_{ijkl} \quad (2)$$

Estimates specifications will vary like in the previous model and subscripts are the same. Likewise the previous model in the Robustness section I will repeat these regressions including

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[34]   and corporate, in the 2014 elections

public funds donated by financial committees. The difference rests on the addition of individual fixed effects, which can now be estimated as the data consists of a balanced panel, replacing the control variables. As before, statistics are robust to heteroskedasticity and standard errors are clustered at the party level in all specifications, making them robust to intra-party correlation. β3 is the continuous differences-in-differences estimator of interest. Additionally I also perform estimates with the treatment variable split into interval dummies, as shown below:

$$log(Y)_{ijklm} = \beta_0 + \beta_1 * Year_l + \beta_2 * (Year_l * D.Treatment_{1-10}) +$$
$$\beta_3 * (Year_l * D.Treatment_{11-20}) + \beta_4 * (Year_l * D.Treatment_{21-30}) +$$
$$\lambda_i + \alpha_j + \gamma_k + \theta_m + \varepsilon_{ijklm} \quad (3)$$

This model's identification strategy rests on the fundamental assumption that the control group trend consists of a valid counterfactual for the treatment group trend in the absence of treatment - the parallel trend assumption. Though it cannot be empirically tested since the treatment group is only observed as treated, one possible way to support this assumption is using more periods of pre-treatment data (Fredriksson and de Oliveira, 2019) to evidence treatment and control groups pattern before treatment. I will do so by collecting data for female candidates that ran in 2010 and 2014 and conducting placebo regressions that will appear in the Robustness chapter.

Even though placebo regressions do not guarantee the validity of the model's identification, coupled with other factors it helps to improve the confidence on it . Those factors are the inclusion of multiple fixed effects and also the fact that the control group is not affected by treatment. Since treatment serves as a proxy for the legislation change that occurred in 2018, parties that already gave 30% of their funds to female candidates likely observed no incentive to change their behavior in 2018.

5 Results

Table 9 shows the estimated coefficients from regression 1 of the Multi-Way Fixed Effects Model. Column (1) refers to the log of public funds, column (2) to the log of all party funds, and column (3) to the log of all the money received by candidates.

Table 9 – Multi-Way Fixed Effects

	(1) Log(Public Funds)	(2) Log(Total Party Funds)	(3) Log(Total Funds)
Year	2.510***	1.926***	1.660***
	(0.230)	(0.230)	(0.142)
Ever Elected	1.675***	1.989***	2.212***
	(0.586)	(0.586)	(0.169)
Ever Elected (x Year)	0.203	-0.095	-0.222
	(0.575)	(0.575)	(0.197)
Ever Candidate	-0.139	0.079	0.097
	(0.253)	(0.253)	(0.062)
Ever Candidate (x Year)	0.302	0.053	0.029
	(0.275)	(0.275)	(0.079)
"Laranja"	-0.943***	-0.877***	-1.249***
	(0.078)	(0.078)	(0.073)
Family	0.482	0.979***	1.382***
	(0.464)	(0.464)	(0.342)
Married	0.095**	0.052	0.129***
	(0.044)	(0.044)	(0.034)
College	0.272***	0.265***	0.409***
	(0.044)	(0.044)	(0.030)
White	0.137***	0.118***	0.148***
	(0.041)	(0.041)	(0.030)
Age	-0.005***	-0.002	-0.001
	(0.002)	(0.002)	(0.002)
Observations	6,134	8,089	11,848
R-squared	0.553	0.533	0.529
Party FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Position FE	Yes	Yes	Yes

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results show that, even though donations increased in 2018 compared to 2014 regardless of the specification used, money from public funds (column 1) had the most drastic change. This increase was mostly due to the creation of another sizeable public fund (the Electoral fund) to compensate for the end of corporate donations. Regarding the candidate's type, it can be seen that candidates that already won an election before hold a considerable advantage on funding over outsider candidates. Those who ran before but never won don't show a significant difference in any case. Further, this model's main coefficients of interest show that this pattern does not seem to have changed differently between years as the interacted terms are not significant at any

level in any specification. This suggests that the increase in funding over the considered years did not favor any of the studied candidacy types in particular.

Over the last few years multiple political leadership training programs were founded in Brazil, aiming to form new leaderships and provide them with the skills necessary to enable a competitive candidacy. Some of those focused on women [35] and were most likely responsible for the relative increase in the number of outsider female candidacies in the 2018 elections. Anecdotal evidence suggests, however, that such initiatives will show more prominent effects on the long run and so this could partially explain the lack of evidence of an increase in relative funding for those candidacies.

Concerning the controls, "Laranja" candidates receive less funding than others as expected. Even with the observed increase in "Laranjas" funding observed in the 2018 elections and displayed in the Data section, those candidacies still receive significantly less than competitive candidates. Those who have relatives in politics receive more than others, especially when total funds are considered. This could indicate that those candidates' advantage in fundraising rests primarily in private funding - or self-funding. Candidates with a college degree and white ones also have significantly higher funding. Finally, age was only significant in the first specification, where results suggest that younger candidates receive on average more access to public funds.

Table 10 presents the estimated coefficients from regressions 2 and 3 of the Diff-in-Diff model. Results appear coupled in the same table, with treatment first appearing as a continuous variable. After, I split it into three dummy variables: Treatment 1-10 represents parties that donated 20-29% of public funds money to women in 2014; Treatment 11-20 represents parties that donated 10-19% of public funds money to women in 2014; Treatment 21-30 represents parties that donated 0-9% of public funds money to women in 2014.

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[35] Like the "Vamos juntas" movement.

Table 10 – Differences-in-Differences

	(1) Log(Public Funds)	(2) Log(Total Party Funds)	(3) Log(Total Funds)
Continuous Treatment			
Year	2.655***	1.200***	0.854***
	(0.574)	(0.294)	(0.272)
Year (x Treatment)	0.006	0.066***	0.043**
	(0.044)	(0.017)	(0.016)
Interval Treatment			
Year	2.899***	1.064***	0.597***
	(0.086)	(0.129)	(0.183)
Year (x Treatment$_{1-10}$)	-0.375	0.291	0.709*
	(0.249)	(1.502)	(0.417)
Year (x Treatment$_{11-20}$)	-0.239	1.289***	1.043***
	(1.167)	(0.237)	(0.345)
Year (x Treatment$_{21-30}$)	0.182	1.574***	1.203***
	(1.066)	(0.316)	(0.297)
Observations	72	658	1,398
R-squared	0.945	0.899	0.914
Candidate FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Party FE	Yes	Yes	Yes
Position FE	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As in the previous model, results show a statistically significant increase in funding in 2018 with respect to the 2014 elections. Furthermore, just like before, this effect was higher in column (1), with public funds as the dependent variable. Regarding the Diff-in-Diff coefficients, column (1) shows no indication that political parties' funds' distribution pattern in 2014 influenced their resource allocation of public funds in 2018. This table has fewer observations since the Diff-in-Diff included only candidates that ran for both the 2014 and 2018 elections. Also, especially in 2014, many candidates did not receive any money from their parties coming from public funds.

However, when considering columns (2) and (3), results suggest a statistically significant impact. Continuous treatment coefficients show that higher treatment values (thus parties that gave less to female candidates in 2014) led to more re-distributive funding in the 2018 elections. This effect is higher when considering the total of party funds rather than the total funds, implying that the change in funding was mostly led by more redistribution from political parties. Parties were then likely merely complying with the change in legislation that now required them to give a minimum of 30% of public funds to female candidates rather than moving forwards towards a more egalitarian funding system.

Moreover, the interval treatment analysis allows for a more detailed look into how the effect is distributed depending on the percentage of money parties gave to women in 2014.

Both in columns (2) and (3), effects are ascending not only in size but also in significance level, reaching 1% of significance and their highest absolute values for the last interval. These estimates corroborate what was already suggested by the results retrieved from the continuous treatment estimated. They also indicate that parties that gave less than 10% of their funding to female candidates changed more than others. This is consistent with the hypothesis that changes reflected a degree of compliance with the new funding requirements.

6 Robustness Checks

This section will show some robustness results generated to support the models described in the Empirical Strategy section.

6.1 Pre-Treatment Placebo

As described in the Empirical Strategy section, the Diff-in-Diff identification strategy rests on the assumption that the control group trend consists of a valid counterfactual for the treatment group trend in the absence of treatment. In order to give support to this assumption, I run placebo regressions collecting data on female candidates that ran for both 2014 and 2010 elections - prior to the change in campaign financing rules. Then, I deflate nominal values to real prices using the IPCA index and run regressions using the same treatment values used in the Results section. When considering only money from public funds[36] distributed by political parties - column (1) in previous Tables - there was only a scant number of observations (<10). Therefore, only specifications for columns (2) and (3) will be shown. Results appear in Table 11 below.

Table 11 – Pre-Treatment Placebo

	(1) Log(Total Party Funds)	(2) Log(Total Funds)
Continuous Treatment		
Year	0.396	0.680***
	(0.565)	(0.198)
Year (x Treatment)	-0.014	-0.007
	(0.032)	(0.012)
Interval Treatment		
Year	0.035	0.748**
	(0.241)	(0.309)
Year (x Treatment$_{1-10}$)	1.063**	-0.316
	(0.398)	(0.410)
Year (x Treatment$_{11-20}$)	0.529	-0.116
	(0.368)	(0.326)
Year (x Treatment$_{21-30}$)	-0.359	-0.302
	(0.344)	(0.375)
Observations	230	1,012
R-squared	0.908	0.933
Candidate FE	Yes	Yes
State FE	Yes	Yes
Party FE	Yes	Yes
Position FE	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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[36] In the 2010 and 2014 elections this referred only to the Party Fund.

Significant year effects appear only when total funds are considered, an indication that the effect did not come from an increase in Party Funds but rather from some of the other sources of funding. Regarding the Diff-in-Diff coefficients, the continuous treatment coefficients were not significant in any specification. For the Interval Treatment, most coefficients were also not significant at any significance level, which supports the hypothesis that the effects observed in the main regressions in the Result sections reflect the change in legislation in 2018. The only significant coefficient was for the Treatment 1-10, concerning parties that in 2014 gave 20 up to 29% of their funds to female candidates. Those parties appear to have increased the share they devoted to female candidates between the 2010 and 2014 elections.

This result does not seem to compromise the model nonetheless. Political Parties belonging to this category were among the ones that gave relatively more funds to women in the 2014 elections (after the parties in the control group). Therefore, an increase significant at 5% significance level could be coming from those parties closer to the Treatment cut-off. To check if this assumption holds, I re-run the Interval Treatment regression for the Total Party Funds splitting the Treatment 1-10 category into two new categories: Treatment 1-2 (parties that gave 28-29% to women in 2014) and Treatment 2-10 (parties that gave 20 - 28%). As expected, the statistically significant effect was coming from parties closer to cut-off. Besides, from Table 15 in the appendix we know that only one party had treatment value between 1 and 2 (PTN). Results for this last regression appear in Table 12 All in all, the placebo regressions give support to the parallel assumption.

Table 12 – Pre-Treatment Placebo new category

	(1) Log(Total Party Funds)
Year	0.033
	(0.240)
Year (x $Treatment_{1-2}$)	1.190***
	(0.240)
Year (x $Treatment_{2-10}$)	0.487
	(1.110)
Year (x $Treatment_{11-20}$)	0.534
	(0.370)
Year (x $Treatment_{21-30}$)	-0.358
	(0.345)
Observations	230
R-squared	0.908
Candidate FE	Yes
State FE	Yes
Party FE	Yes
Position FE	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6.2   Financial Committees

In the Funding section in the Data chapter, I brought attention to financial committees' existence in the 2014 elections. Parties could give money from the party fund directly to candidates, but the committees could also take this responsibility. This money wasn't initially accounted for during the database construction as the TSE electoral data repository classifies these resources alongside money received from other candidates. Adding the money given by other candidates would most likely imply double counting - at least. If candidate X received money from party A and then gave it to candidate Y, this amount would appear in both accounts, which would bias estimation. In order to deal with this, I restricted my analysis to money donated directly by political parties. However, by doing so I ignore the money from the committees.

Using further information regarding the donations, I separate between party fund money given by other candidates and distributed by those committees and show the results as a Robustness check to the models. Table 13 show results for the Multi-Way Fixed Effects model and Table 14 for the Diff-in-Diff. In both cases, the Total Funds column was omitted since they already included money from committees by combining all received funds. The results in both tables corroborate the findings of the Results section. Therefore, both models are robust to the inclusion of financial committees.

Table 13 – Multi-Way Fixed effects with committees

	(1) Log(Public Funds)	(2) Log(Total Party Funds)
Year	2.836***	2.022***
	(0.263)	(0.201)
Ever Elected	1.519***	1.967***
	(0.420)	(0.243)
Ever Elected (x Year)	0.353	-0.083
	(0.406)	(0.280)
Ever Candidate	-0.137	0.056
	(0.193)	(0.088)
Ever Candidate (x Year)	0.297	0.074
	(0.211)	(0.106)
"Laranja"	-0.936***	-0.874***
	(0.076)	(0.065)
Family	0.518	1.043***
	(0.462)	(0.408)
Married	0.087**	0.050
	(0.041)	(0.036)
College	0.279***	0.266***
	(0.043)	(0.036)
White	0.133***	0.112***
	(0.042)	(0.039)
Age	-0.005***	-0.001
	(0.002)	(0.002)
Observations	6,269	8,217
R-squared	0.559	0.529
Party FE	Yes	Yes
State FE	Yes	Yes
Position FE	Yes	Yes

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14 – Differences in Differences with committees

	(1) Log(Public Funds)	(2) Log(Total Party Funds)
Continuous Treatment		
Year	2.905***	1.282***
	(0.628)	(0.329)
Year (x Treatment)	0.008	0.063***
	(0.031)	(0.019)
Interval Treatment		
Year	2.899***	1.050***
	(0.083)	(0.110)
Year (x Treatment$_{1-10}$)	-0.325	0.289
	(0.196)	(1.485)
Year (x Treatment$_{11-20}$)	0.245	1.427***
	(0.890)	(0.247)
Year (x Treatment$_{21-30}$)	0.160	1.562***
	(0.502)	(0.329)
Observations	124	704
R-squared	0.948	0.898
Candidate FE	Yes	Yes
State FE	Yes	Yes
Party FE	Yes	Yes
Position FE	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

7   Final Remarks

Building upon previous literature regarding electoral politics in Brazil, this study analyses the effects of a change in campaign financing legislation concerning public funds distribution. Since corporate donations were banned in 2015, public funds became the most important source of money for candidates. Therefore, a law with direct implications over at least 30% of its total amounts has far-reaching implications over the electoral process. Results suggest, however, that the law was not effectively enforced, and hence the desired advance in female candidacies did not materialize.

Starting from a descriptive analysis, this study shows that not every party complied with the legislation - and so far those who did not meet the required minimum faced no consequences. Secondly, some parties only reached the minimum when donations for female vice-governors and senator substitutes running with male candidates were considered. Since those women may never actually be in office - only if the male candidate is elected and has to step down - it could be argued that these should not be considered for the law's requirements. Thirdly, even the money directed to female-led candidacies should be interpreted with caution, given the prevalence of a popular kind of electoral fraud (the "Laranja" candidacies) in the 2018 elections. Moreover, those who gave more financial assistance to female candidates were also the ones who received less money from the Electoral Fund. Conversely, receivers of the highest shares were among the least supportive of female candidates. Finally, especially in parties that launched presidential candidates, resources were concentrated on a handful of female candidates. Overall, this evidence stresses the importance of investigating expenditures not only through a quantitative perspective but also through a qualitative one.

Nonetheless, results from empirical models show that women did receive more funding in 2018. This increase affected not only candidates with prior political experience but also outsiders running for the first time. Outsiders, however, despite having increased in proportion relative to the 2014 elections, still receive less than those who were already elected, in roughly similar patterns as the ones who already ran but never won before. With regard to party distribution patterns, I find that parties with more uneven distribution of funds between sexes in 2014 were the ones where funding for female candidacies increased the most. These findings corroborate the hypothesis that change was driven mostly by the law.

Overall, results indicate a positive impact of the legislation on the funding of female candidacies in 2018, but this impact was small and still not enough to affect electoral results. Being the key gatekeepers for political recruitment, it is essential that political parties invest more in female candidacies. Respecting the law and providing them with enough funding to have competitive candidacies is a crucial step in that direction. However, this measure should complement other policies and initiatives to level the playing field, such as the existing gender quotas and the investment in recruitment programs to encourage potential female candidates.

In conclusion, the multiple ways in which political parties try to circumvent rules that

would benefit women in politics, thus violating traditional gender roles, evidence how women still face cultural barriers in Brazil that hinder their participation in politics (De Paola et al., 2010). For the upcoming years, the fostering of female representation in politics is equally urgent and uncertain to happen. It remains to be seen whether compliance with the new legislation will be enforced or if defenders of the status quo will prevail in their intent to keep women out of the political field. Hopefully, with ever-growing evidence on what policies work and knowledge on the importance of applying strict enforcement, meaningful change can take place in the nearby future.

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8 Appendix

Figure 11 – Elected Women for the Chamber of Deputies in 2018 elections, by state

Data: Electoral Data Repository, TSE

Figure 12 – Elected women Federal Deputies, by state

Data: Electoral Data Repository, TSE

Table 15 – Treatment values

Party	Treatment	Treatment Status	Cands, 2014	Cands, 2018
PRP	0	Control	36	25
PRTB	0	Control	16	19
PSTU	0	Control	17	14
PT	0	Control	62	52
PODE	1.96	Treatment	14	21
PSOL	7.51	Treatment	42	47
PCO	8.45	Treatment	1	1
PSB	11.21	Treatment	39	32
PTB	11.54	Treatment	33	32
PSL	12.53	Treatment	14	12
PDT	12.54	Treatment	32	35
PR	13.37	Treatment	22	23
PP	13.72	Treatment	34	28
PC do B	14.52	Treatment	34	35
MDB	17.43	Treatment	61	57
PTC	17.88	Treatment	19	17
PPL	18.86	Treatment	11	10
DC	19.93	Treatment	18	23
PPS	21.23	Treatment	18	19
SOLIDARIEDADE	21.3	Treatment	16	20
PHS	22.24	Treatment	20	30
PRB	22.33	Treatment	27	22
PATRI	22.37	Treatment	19	18
PMN	23.27	Treatment	11	15
PSC	23.82	Treatment	33	19
PV	25.09	Treatment	44	35
PSDB	26.06	Treatment	49	55
PSD	26.23	Treatment	17	21
DEM	26.56	Treatment	19	18
AVANTE	27.9	Treatment	17	22
PCB	28.53	Treatment	4	3
PROS	29.78	Treatment	12	19

Notes: Column (2) shows the treatment value for each political party according with the share of public funds money they donated to female candidates in 2014. Since treatment is calculated as 30 minus the share they distributed, those with treatment equal to zero represent parties that donated more than 30%. Column (3) reports the treatment status of the party and columns (4) and (5) show respectively the number of female candidates in the 2014 and 2018 elections running female-led candidacies in that party. It is important to recall that for this analysis only candidates running for both the 2014 and 2018 elections are included. Therefore, the total number of female contestants in each party is bigger than that reported in columns (4) and (5).

Figure 13 – Elected women State Deputies, by state

Data: Electoral Data Repository, TSE