A Study on the Impact of Campaign Finance, Political Capital and Gender on Electoral Performance*

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This article analyzes the association between political finance and electoral performance in the 2010 Brazilian elections for state and federal deputies. It also investigates the interaction effect of incumbency and gender on this association. We conclude: (i) there is a positive and statistically significant association between political finance and electoral performance, yet the intensity of this association varies according to the type of candidate; (ii) the association is stronger for challengers than for incumbents – thus extending the "Jacobson effect" to the Brazilian case; and (iii) the association is stronger for women than for men – which suggests an extension of the idea underlying the "Jacobson effect". The association between finance and electoral performance tends to be stronger for candidates facing electoral disadvantages, whether these stem from limited political capital, gender discrimination, or any other factor not studied here resulting in a similar effect. Political finance works as a tool that, to some extent, may counteract the negative effect of such factors on electoral performance.

Keywords: Campaign finance; political capital; incumbency; gender; electoral performance.

Introduction

Who gets more votes and why? In looking for the reasons that explain electoral success, the academic literature has drawn attention to the importance of political finance, meaning the funding of election campaigns. The nature of the relation between money and electoral success has stirred the interest of political scientists ever since systematic data on campaign finance have become available. Researchers have analyzed the relation between money and votes, having identified specific patterns, as in the work by Jacobson (1978) on how political finance affects incumbents and challengers differently and that by Coate (2004) on the informational value of electoral expenditures[1]. On the other hand, the literature also points to multidirectional causal relations, since money may yield votes, yet the expectation of future voting may drive donations, while both– donations and votes – may result from characteristics of candidates and donors (STRATMAN, 2005). This article analyzes the impact of campaign finance on electoral success.

The literature also dwells on the role of other factors influencing electoral success, either directly or indirectly, via campaign finance patterns. In this article we focus on two of these factors: incumbency and gender.

The outcome of prior elections is an important factor for success in the next election. Those who succeeded in previous elections are more likely to do well in the next election. This finding might express a relation of cause and effect – successful current incumbency leads to positive outcomes in the following election – or might be traced back to a single common cause – both outcomes stem from the same characteristics of candidates which impact on both elections. In any case, the high rate of incumbent reelection bids expresses an element of inertia which is a characteristic of contemporary representative democracies, as noted by Norris & Inglehart (2003). Those who have joined politics are bound to stay in politics. In this article our interest in the candidates' track record builds on the assumption that electoral capital can mediate the relation between money and electoral success (JACOBSON, 1978).

Lastly, the relation between gender and electoral success has gained salience in more recent publications. The search for factors accounting for the low presence of women in legislative Lower Houses – 20% on average worldwide, 8.6% in Brazil's Chamber of Deputies[2] – includes, for instance, political culture, as women have developed their own pattern of political engagement (COFFÉ & BOLZENDAHL, 2010) and political values

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1 A review of the U.S. literature on the theme can be found in Figueiredo Filho (2009, pp. 64-67).

2 Data by the Inter-Parliamentary Union, updated on July 31st, 2012, available at www.ipu.org/wmn-e/world.htm

(INGLEHART & NORRIS, 2000). Other approaches point to institutional matters, such as the electoral system and the central role of political parties (HTUN, 2005). From the perspective of the institutionalist approach, a key question concerns the gender quotas that have been adopted by some countries as a means to increase women's representation. Several recent papers have identified campaign finance as an additional bottleneck for the performance of women candidates at the polls[3]. Our interest in the gender factor stems from the question raised previously: Beyond analyzing the importance of money for electoral performance, we focus on the interaction effect. We wish to know if money matters more for women candidates than for their male competitors.

Therefore, in this article we will discuss the relation between political finance and electoral performance, as well as the mediating role played by electoral capital and candidate gender on this relation. We focus on the 2010 elections for federal and state deputy and base our inquiry on data disclosed by the *Tribunal Superior Eleitoral (TSE, the Brazilian electoral management body)*[4]. We divide the article into four sections, in addition to this introduction. First, we conduct a brief review of the literature that relates electoral performance to the three elements mentioned above. Second, we present the variables and data used and the hypotheses to be tested. In the third section we run the statistical tests. The fourth section contains the final remarks and discusses challenges for further inquiry.

Brief review of the literature

Electoral finance

Research on political finance in Brazil started as soon as data on the financing of election campaigns became available[5]. The first studies by Samuels (2001) were based on partial data on the financing of the 1994 and 1998 elections[6]. Since 2002, Brazil's TSE has released comprehensive data on the funding of all candidates for all offices[7] and, from the 2010 election onwards, this set of data has also included resources channeled to political parties. The amount and quality of empirical research on election finance has grown in the same proportion as information has become more complete, accessible, and

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3   Ohman (2011) reviews recent global trends in the use of public finance to encourage political parties to increase gender equality among candidates.

4   Available at http://www.tse.jus.br.

5   For a review of the literature on the determinants and outcomes of political funding in Brazil, see Mancuso (2012).

6   The data on candidates and offices gathered by Samuels for these races are not complete.

7   Data on candidate funding is based on disclosure of expenditures by individual candidates or committees.

consistent. Several studies have focused on the connection between campaign finance and votes. The first analyses on the relation between money and votes, developed by Samuels (2001), showed a high correlation between both variables. The same author identified a positive and statistically significant association between resources and votes for the 1994 and 1998 federal deputy elections. Marcelino (2010) found a positive and significant association between campaign expenditures and votes in the 2002 and 2006 elections for the federal Chamber of Deputies. Figueiredo Filho (2009) and Peixoto (2004; 2010) also point to a positive and significant relation between these variables for the same chamber's 2006 elections. While research on the electoral impact of campaign finance in Brazil has increased in size and sophistication, no systematic effort has been made to assess the role of other factors conditioning the relation between money and votes. This article suggests opening this discussion on interaction effects in campaign finance.

The incumbency factor

Studies of the impact of a candidate's track record on electoral performance typically build on the incumbency variable as a proxy to gauge the "political capital" (or "electoral capital") factor. However, assessing the incumbency effect does not cover the variety of political capital. Political capital also includes other non-elective offices held in the public administration, in political parties and in civil society organizations. Political capital also includes experience in elections lost or in holding elective offices different from those candidates run for. In practice resorting to the "incumbency proxy" is largely due to the difficulty in accessing more detailed data on these different dimensions of the political/electoral capital of candidates. Reelection studies have developed on two different levels. Firstly, by solely focusing on the group of deputies running for reelection and comparing their performance in office with the success they had in the next election; and secondly, by analyzing all candidates and comparing the electoral performance of the incumbents' subgroup with the remaining candidates.

Leoni, Pereira & Rennó (2003) fall into the first category when assessing political characteristics and lawmaker performance to predict an incumbent's decision to run for reelection or not. In subsequent studies, Pereira & Rennó (2007) contrast performance indicators during a term in office with electoral results of incumbents seeking reelection. The focus of these studies is placed exclusively on the relatively homogeneous subgroup of incumbents running for reelection. The amount of information available on their performance in the parliamentary arena allows for important comparisons across "strategies to survive politically"[8].

8   This quote is part of the title of an article by Leoni, Pereira & Renno (2003).

When we move to the second group of studies, which covers a more heterogeneous group of candidates, garnering data becomes more challenging. For this reason a typical research design is based on comparison of the performance of incumbent candidates running for reelection with that of the other candidates. For example, in an analysis of the effect of a number of factors on the electoral success of federal deputy candidates in 2002, Araújo & Alves (2007) show that an incumbent's chance of being reelected is twenty-six times higher than that of the other candidates. The incumbency factor effect is higher than all other socioeconomic factors analyzed in the study, such as schooling, age, and sex. Perissinotto and Miriade (2009) found in their analysis of the sociological profile of candidates for federal deputy in 2006 an odds ratio of ten to one for those already holding any political office (including for city council members), in comparison with the other group. While research focused on legislature and on political careers recognizes the importance of previous political experience (MIGUEL, 2003), electoral studies have not covered the interaction effect of incumbency and campaign finance.

Gender and political representation

The relation between gender and electoral success in Brazil has been the subject of studies underscoring a weak presence of women in elective offices in every level of the federation. Women's underrepresentation is less salient in local politics and in less developed regions (MIGUEL & QUEIROZ, 2006). While Brazil's proportional election system favors minority representation, compliance with mandatory quotas introduced in 2006 has led to an increase in the number of women among candidates (SACCHET, 2012). In contrast, while the open-list system places the decision in the hands of the voter, conservative attitudes regarding the role of women in politics render it difficult for them to succeed in the electoral arena (BOHN, 2009).

Another theme is the role of political parties. The institutional structures for recruiting and selecting candidates, along with programmatic commitment to promoting gender equality, are crucial for promoting female candidacies within the parties (SACCHET, 2005). Mechanisms within political parties are seen as hurdles for increasing the share of women in politics. While Brazilian parties recruit roughly the same number of men and women as members (ALVARES, 2008), a variety of selection processes reduces women's participation in party offices and on party lists (MENEGUELLO et al., 2012). Recent studies show that women's difficulty in getting elected is also linked to campaign finance (SACCHET & SPECK, 2012a).

Yet, the presence of women in the legislature does not necessarily represent a breakthrough in gender equality policies. Advocacy of women's causes is mostly led by leftist

party representatives, though not necessarily by the contingent of women in the legislature (HTUN & POWER, 2006).

This review of studies on women in politics reveals that only a small number of studies covers the dynamics of the electoral process and, among these, only a few analyze the role of political funding. Our text seeks to advance the study of the association and interaction between the variable "sex" and other factors affecting electoral success.

Variables and working hypotheses

Data on political finance

Our independent variable is campaign finance. Campaign finance statements are filed by candidates with the TSE, which organizes and discloses these reports. As we chose to measure each individual candidate's finance in state and federal deputy elections, spending by party headquarters and by committees is not computed[9]. We worked with data on total funds raised[10].

The various funding patterns across offices and states render it difficult to compare the data. On average, state legislature races are less expensive than races to the federal Chamber of Deputies. Moreover, campaign costs vary across states depending on such factors as, inter alia, size of constituency, geographic density, region's economic power, and election competitiveness. BRL 1,000 for a campaign in Roraima is not the same as BRL 1,000 for a campaign in São Paulo.

To render the data comparable we calculated an index that indicates a candidate's funding ratio to total funds raised by all candidates running for the same office, within the same state. For example, let us assume that all federal deputy candidates in the state of Bahia raised together BRL 20 million. Candidate A raised BRL 200,000. This candidate's fund-raising index is 1, corresponding to one percentage point of all candidates' total funding. The sum of values assigned to all of a state's candidates running for a given office is always 100. We adopted this solution in order to face electoral-campaign cost variation across states and offices. Whereas absolute values allow analysis of funding data only on a state-by-state basis, by measuring the relative fund-raising success of each candidate this indicator enables comparison across candidates, regardless of territorial division.

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9   According to the Brazilian law, candidates can opt to file campaign finance reports either as individual candidates or as a group of candidates running for the same party. This group is labeled a committee. Most candidates prefer the first approach.

10   In general, a candidate's total contributions equal expenditures. However, some candidates transfer a share of their campaign funds to political parties or other candidates. By the end of the campaign, these funds need to be balanced, requiring additional transfers from or to parties.

Throughout the text we use the terms "campaign finance", "funds" or "money" as synonymous with this variable measuring total contributions made to candidates.

Data on incumbency

In order to analyze the incumbency factor, we identified the candidates who, having won in the previous election, opted to run for reelection for the same office, and coded them as "incumbents". All other candidates are the "challengers". For this study we did not consider as incumbents all those candidates who, throughout the preceding legislature, replaced state or federal deputies as substitutes. Conversely, we considered as incumbents all those candidates bidding for reelection who had left office, regardless of length of time, to hold other offices such as ministries or departments or for other reasons[11]. In order to create the dataset we drew on the TSE's election records[12]. As a rule, we refer to this variable as "incumbency" but, at moments, more especially during the conclusion, we use the broader term "political capital".

Data on gender

Data on candidate gender are part of the TSE database and were included as a second control variable.

Electoral success

The dependent variable in this analysis is electoral performance. There are two more customary ways of measuring electoral performance: Based on the absolute number of votes a candidate has won or on the official result of the elections, separating the elected from the not elected.

From the point of view of statistical analysis, votes provide a continuous variable, whereas electoral results are expressed as a dichotomous variable. Even though individual performance is more accurately measured when using the number of candidate votes as an indicator of electoral success, the fact is that, ultimately, the election is about either getting elected or not. The first 100 votes are less important than the 100 votes that eventually

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11 In other studies substitutes are computed as incumbents, for example, in Mancuso and Speck (2012).

12 Other works focusing on the impact of political capital on electoral performance used the candidate's declared occupation as input data (PERISSINOTO & MIRIADE, 2009). It is worth noting that this information tends to underestimate political experience because it is based on the candidate's self-declared occupation before the electoral management body. Often, holders of elective offices declare their profession as their occupation, thus underestimating the group of professional politicians.

separate the best performing losing candidate from the worst performing candidate. Adopting the dichotomous criterion of electoral success takes into account this final outcome; however, a specificity of the Brazilian electoral system makes this approach less precise. The Brazilian proportional open-list system allows for poorly voted candidates to be elected, provided they run on a party list headed by top-ranked, vote-winning candidates. Thus, being among elected candidates does not necessarily depend on individual performance, casting doubt on the validity of the dichotomous criterion to assess electoral performance.

We will explain this in more detail. In Brazil's Chamber of Deputies and state legislatures, seats are allocated to parties or bipartisan/multiparty coalitions in accordance with the proportional representation system. Once the votes have been counted, first the electoral quotient is calculated by dividing a district's total valid votes (candidate and party/coalition votes) by the number of available seats for that district[13]. The party quotient is calculated next by dividing a party's or a coalition's total valid votes by the electoral quotient. The remaining seats are allocated based on the "average" criterion[14]. The party quotient and the allocation of the remaining seats based on the "average" criterion define the number of seats a party or coalition will hold. The top-voted candidates of a given party or coalition are elected to the number of seats the party or coalition is entitled. Due to this system, individually top-voted candidates do not always get elected. Actually, 9.9% of the federal deputies elected in 2010 (51 out of 513) were not among the most voted in their districts, in relation to the number of seats in contest. Similarly, 13.2% of the state deputies elected in 2010 (140 out of 1059) were not among their districts' top-voted candidates. Therefore, in this article we replace the distinction between elected and not elected candidates. Hence, we chose an alternative solution that combines the advantages of both measurements, by measuring individual candidate performance and by dividing candidates into two groups, a top-voted group and a group with all the other candidates.

How do we identify the top versus the least voted candidates? The top vote-winning group includes candidates who had the best individual electoral performance in terms of the number of votes. The total number of candidates in this group is given by the number of vacant seats. The calculus, step by step, was as follows. First, we ranked all candidates by the number of personal votes. This calculus does not take into account party or coalition lists.

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13   In both cases the electoral districts are the twenty-six states, plus the Federal District. Allocation of Chamber of Deputies' seats ranges from a minimum of eight to a maximum of seventy seats. And the allocation of seats for state legislatures ranges from a minimum of twenty-four to a maximum of ninety-four seats.

14   The following formula is used to calculate the average: Valid party or coalition votes divided by number of seats won by party quotient + number of vacant seats won by the "average criterion" + 1.

The second step is to separate these candidates in two groups, establishing as a cut point the number of vacant seats in each state. For example, the state of Espírito Santo elects 10 federal deputies. Provided 300 candidates ran for office, they will then be ranked by the number of votes for each candidate. The top-10 vote-winning representatives are in the most-voted group and the remaining 290 are in the least-voted group. Throughout the text we will use the term "electoral performance" for this variable, but to avoid repetitions we will also resort to such synonyms as "electoral success", "performance at the polls" and the like.

Hypotheses

Our first hypothesis is that there is a positive and statistically significant association between political finance and electoral performance in elections for state and federal deputies in Brazil, yet the strength of this association varies according to the type of candidate. In other words, an increase in political finance is associated with an increase in the chances of electoral success, yet the strength of this association is different for incumbents and challengers, as well as for men and women.

The second hypothesis is that this relation between finance and electoral success is moderated by the "incumbency" factor. Therefore, the importance of money for electoral success is greater for challengers than for incumbents.

The third hypothesis is that the relation between funding and electoral success is moderated by the candidates' sex. The importance of money for electoral success is greater for women than for men.

Analysis of the data

The initial part of this section is dedicated to a presentation of descriptive statistics showing the association of the main independent variable (political finance) and the control variables (incumbency and gender) with the dependent variable (electoral performance) and with each other. The final part of the section is dedicated to presenting logistic regression models that measure the effect of the independent variable on the dependent variable while also showing how this effect is affected by the interaction of the independent variable with the control variables. In other words, before analyzing how gender and incumbency influence the relation between finance and electoral performance, which in terms of statistical analysis corresponds to the analysis of the effects of the interaction between the main independent variable and the control variables, we will analyze the association between the variables selected. Chart 1 summarizes the associations that will be analyzed in the initial part of this section.

Chart 1: Association between variables

Independent and control variables	Most voted (dependent variable)	Finance	Incumbency
Finance	Table 1		
Incumbency	Table 2	Table 3	
Gender	Table 4	Table 5	Table 6

Source: Chart prepared by authors.

Table 1 illustrates the difference between campaign funds received by the top vote-winning candidates and other candidates[15]. Whatever the statistic chosen, it is absolutely clear that the amount of funding received by the first group is significantly higher than that received by the second one. For example, in the case of state deputies, the average amount received by the most voted candidates is 9.4 times higher than that received by the least voted; and the median amount, less sensitive to variation in extremely low or extremely high values, is 34 times higher for the first group. In the case of the federal deputies, the most-voted candidates received, on average, funding 12.1 times higher than the other candidates. The median amount received by the most-voted candidates for federal deputy is 110 times higher than that received by all other candidates.

Table 1. Campaign funding for candidates to state legislative assemblies and Chamber of Deputies in 2010. Comparison by electoral performance (% of total finance for office, in each state)

		25th percentile	Median	Mean	75th percentile	N
State deputy	Most voted	0.56	1.02	1.32	1.75	1059
	Least voted	0.01	0.03	0.14	0.12	9119
	Most/Least voted	56.0	34.0	9.4	14.6	
Federal deputy	Most voted	1.08	2.20	3.38	4.31	511
	Least voted	0.00	0.02	0.28	0.12	3487
	Most/Least voted	-	110.0	12.1	35.9	

Source: Prepared by authors based on Higher Electoral Court (TSE) data.

However, when analyzing the association between political finance and electoral performance, one must consider the importance of other variables. As explained in the previous pages, in this article we highlight the importance of two elements: incumbency and gender.

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15   All the following tables that show funding amounts only include candidates who declared some income to the Electoral Court.

It is reasonable to expect a positive and significant association between incumbency and electoral performance because incumbents can leverage their offices to build or strengthen ties with the electorate by, for example, meeting constituency demands and/or performing well in the lawmaking and oversight activities typical of a parliamentarian's work. Table 2 provides proof for this association for the 2010 elections.

Table 2. Electoral performance by incumbency. Candidates to state legislative assemblies and Chamber of Deputies in 2010

		Most voted	Other	Total
State deputy	Incumbents	564 53.3%	162 1.4%	726 5.8%
	Other	495 46.7%	11375 98.6%	11870 94.2%
	Total	1059	11537	12596
	χ^2= 4801.669 (0.000) Odds ratio= 80.004			
Federal deputy	Incumbents	279 54.4%	76 1.7%	355 7,3%
	Other	234 45.6%	4279 98.3%	4531 92,7%
	Total	513	4373	4886
	χ^2=1888.827 (0.000) Odds ratio= 67.412			

Source: Prepared by authors based on TSE data.

Incumbents accounted for only 5.8% of all state legislature candidates (726 of 12,596) and 7.3% of all federal representative candidates (355 of 4,886). However, the proportion of incumbents among the top voted rises to, respectively, 53.3% (564 of 1,059) and 54.4% (279 of 513). The chi-square test suggests that the chance of error is minimal with regard to an association between the variables "incumbency" and "electoral performance". In the case of state legislature candidates, the likelihood of an incumbent being in the most-voted group is 80 times higher than the chances of a challenger being in that same group. In the case of the federal representative candidates, it is 67.4 times higher.

It is also reasonable to expect an association between reelection race and the independent variable, that is, campaign funding. For one, incumbents can raise more funds than challengers because they have a track record to inform potential donors. For another, donors may prefer incumbents precisely because they know these have a greater chance of electoral success, thus rendering their political investment much safer. Table 3 presents evidence of that. Regardless of the statistics, the amounts raised by incumbents who are

running for reelection for state and federal legislatures is many times higher than the amounts raised by other candidates[16].

Table 3. Campaign funding for candidates to state legislative assemblies and Chamber of Deputies in 2010. Comparison by incumbency

(% of total finance for office, in each state)

		25th percentile	Median	Mean	75th percentile	N
State deputy	Incumbents	0.54	0.96	1.26	1.64	723
	Other	0.01	0.03	0.19	0.14	9455
	Incumbents/Other	54.0	32.0	6.6	11.7	
Federal deputy	Incumbents	0.97	2.11	3.14	3.87	354
	Other	0.00	0.02	0.43	0.16	3644
	Incumbents/Other	-	105.5	7.3	24.2	

Source: Prepared by authors based on TSE data.

The candidate's gender is another element that, according to the literature, may be associated with electoral performance and total funds raised. In the first place, it is important to underscore women's underrepresentation in the group of candidates. In the 2010 elections, the percentage of women candidates for state legislatures was 20.9% (2,638 of 12,598) and 19.1% for the federal Chamber of Deputies (933 of 4,886). These are very low percentages, since women account for about half of Brazil's population and electorate. Still, the proportion of women among the top-voted candidates is even smaller: Only 13% in state legislatures (138 out of 1,059) and 9% in the Chamber of Deputies (46 out of 513). Table 4 shows a consistent negative association between female sex and electoral performance, that is, even when we take into account the fact that there are fewer women candidates than men candidates, there are even fewer women among the top voted than expected. Respectively, in the cases of state and federal representative candidates, the likelihood of a woman being among the top-voted group corresponds to 54.2% and to 38.7% of the chances of a man being in this group.

16   As one of the anonymous reviewers correctly remarked, both for incumbents and challengers the mean is higher than the median, which is indicative of an asymmetric distribution of campaign finance. The asymmetry is more noticeable in the challengers' subgroup, where the mean exceeds even the 75th percentile. Therefore, this subgroup is quite heterogeneous and it might be worth analyzing the extreme cases of well-funded challengers. The same comment is applicable to Table 1, which compares most voted and least voted candidates.

Table 4. Electoral performance by gender. Candidates to state legislative assemblies and Chamber of Deputies in 2010

		Most voted	Other	Total
State deputy	Men	921 87.0%	9037 78.3%	9958 79.1%
	Women	138 13.0%	2500 21.7%	2639 20.9%
	Total	1059	11537	12596
	χ^2= 43.715 (0.000) Odds ratio= 0.542			
Federal deputy	Men	467 91.0%	3486 79.7%	3953 80.9%
	Women	46 9.0%	887 20.3%	933 19.1%
	Total	513	4373	4886
	χ^2= 38.061 (0.000) Odds ratio= 0.387			

Source: Prepared by authors based on TSE data.

The more recent literature (SACCHET & SPECK, 2011) suggests that gender and finance are associated with each other, not just with electoral performance. The data in Table 5 confirm this. The descriptive statistics below show that men's political finance is consistently higher than that of women. The average funding raised by male state legislature candidates is 27% higher than that of women, while male candidates running for the federal Chamber of Deputies raise, on average, 48% more than their female competitors. In terms of median value, the difference is, respectively, 100% and 200%.

Table 5. Campaign funding for candidates to state legislative assemblies and Chamber of Deputies in 2010. Comparison by gender (% of total finance for the office, for each state)

		25th percentile	Median	Mean	75th percentile	N
State deputy	Men	0.01	0.04	0.28	0.24	8303
	Women	0.00	0.02	0.22	0.11	1875
	Men/Women	-	2.0	1.27	2.2	
Federal deputy	Men	0.01	0.03	0.71	0.35	3355
	Women	0.00	0.01	0.48	0.13	643
	Men/Women	-	3.0	1.48	2.7	

Source: Prepared by authors based on TSE data.

Also worth investigating is the association between incumbency and gender. Table 6 shows that women are significantly underrepresented in the group of incumbents running for reelection, both among state and federal legislature candidates. The likelihood of a woman being among the incumbents corresponds to 43.8% of a man's likelihood of being

in this group in the case of candidates running for state legislatures; and to 37.1%, in the case of federal lower house candidates.

Table 6. Incumbency by gender. Candidates to state legislative assemblies and Chamber of Deputies in 2010

		Incumbents	Other	Total
State deputy	Men	648 89.3%	9310 78.4%	9958 79.1%
	Women	78 10.7%	2560 21.6%	2638 20.9%
	Total	726	11870	12596
	χ^2= 48.404 (0.000) Odds ratio= 0.438			
Federal deputy	Men	325 91.5%	3628 80.1%	3953 80.9%
	Women	30 8.5%	903 19.9%	933 19.1%
	Total	355	4531	4886
	χ^2= 28.077 (0.000) Odds ratio= 0.371			

Source: Prepared by authors based on TSE data.

So far we have seen that political finance, incumbency, and gender are variables associated with electoral performance and with each other. Our next step is to argue that the association between campaign finance and electoral performance is influenced by the interaction of the main independent variable with the control variables[17].

The difference between the concepts of association and interaction is important for our discussion. Let us consider three different settings. In the first setting, money, incumbency, and gender matter for electoral success, yet there is no association between the three variables. In this case the results of the univariate analysis of the associations between money, incumbency, and gender with electoral performance would not be different from multivariate analysis results. In the second setting, each one of the variables is associated with electoral success, yet in addition is associated with each other. For example, women have poorer electoral results but, in addition, are more poorly funded; and besides, they are the minority among incumbents, which also diminishes their chances of electoral success. Multivariate analysis will identify the contribution of each of the variables, which are controlled by each other. Eventually one of the variables might lose significance and/or weight because its contribution is explained by another variable. Women's lower chances at the polls might be attributed to lower access to resources or to lower political capital. In the third setting the impact of money on election results is affected by the interaction with

17   On the importance of accounting for variable interaction in an explanatory model, see Brambor, Clark & Golder (2006).

other variables, such as incumbency and gender. In this case, the intensity of the association between finance and electoral performance is significantly different for incumbents and challengers, and also for men and women.

Table 7. Logistic regression model with interactions. Candidates to state legislative assemblies and Chamber of Deputies in 2010

Variables	State deputy		Federal deputy	
	B	Odds ratio	β	Odds ratio
7a. Reference group: Women incumbents (Challenger= 1, Incumbent= 0; Men = 1, Women = 0)				
Finance	2.184**_	8.882	.143___	1.153
Incumbency	-3.393***	.034	-5.192***	.006
Gender	1.530*__	4.619	-.021___	.979
Finance* Incumbency	.935___	2.547	1.049***	2.853
Finance*Gender	-1.434*__	.238	.132___	1.141
Incumbency*Gender	-1.088___	.337	1.247___	3.481
Finance*Incumbency*Gender	.868___	2.382	-.615*__	.541
Constant	-1.018___	.361	.690___	1.994
7b. Reference group: Women challengers (Incumbency= 1, Challenger= 0; Men = 1, Women = 0)				
Finance	3.119***	22.622	1.191***	3.291
Incumbency	3.393***	29.762	5.192***	179.840
Gender	.442*__	1.555	1.226**_	3.408
Finance* Incumbency	-.935___	.393	-1.049***	.350
Finance*Gender	-.567*__	.567	-.483**_	.617
Incumbency*Gender	1.088___	2.970	-1.247___	.287
Finance*Incumbency*Gender	-.868___	.420	.615*__	1.849
Constant	-4.411***	.012	-4.502***	.011
7c. Reference group: Men challengers (Incumbency= 1, Challenger= 0; Men = 0, Women = 1)				
Finance	2.552***	12.837	.708***	2.031
Incumbency	4.482***	88.377	3.945***	51.661
Gender	-.442*__	.643	-1.226**_	.293
Finance* Incumbency	-1.803***	.165	-.434***	.648
Finance*Gender	.567*__	1.762	.483**_	1.621
Incumbency*Gender	-1.088___	.337	1.247___	3.481
Finance*Incumbency*Gender	.868___	2.382	-.615*__	.541
Constant	-3.969***	.019	-3.276***	.038
7d. Reference group: Men Incumbents (Incumbency= 0, Challenger= 1; Men = 0, Women = 1)				
Finance	.750***	2.116	.275**_	1.316
Incumbency	-4.482***	.011	-3.945***	.019
Gender	-1.530*__	.217	.021___	1.021
Finance* Incumbency	1.803***	6.065	.434***	1.543
Finance*Gender	1.434*__	4.197	-.132___	.876
Incumbency*Gender	1.088___	2.970	-1.247___	.287
Finance*Incumbency*Gender	-.868___	.420	.615*__	1.849
Constant	.512**_	1.669	.669**_	1.952
	Likelihood ratio test -2LL: 3263.806 χ²: 3532.803 DF: 7 p: .000		Likelihood ratio test -2LL: 1606.761 χ²: 1449.389 DFGL: 7 p: .000	

* = $P \le 0.05$; ** = $P \le 0.01$; *** = $P \le 0.001$.
Source: Prepared by authors based on TSE data.

We used logistic regression to test for a positive and significant association between campaign finance and performance in the 2010 elections for state and federal deputies, controlling by gender, incumbency and by the interaction terms of these control variables with each other and with the main independent variable. The inclusion in the model of the main independent variable, of the control variables, and of the interaction terms were theoretically justified in section I and, empirically, by the descriptive statistics presented in the initial part of this section III.

As explained earlier, the main independent variable is a continuous variable that indicates the share of funds raised by each candidate in relation to total capital raised by all candidates running for the same office in the same state. The dependent variable "electoral performance" is a dummy variable. This variable indicates whether the candidate is in the top-voted group or not, in accordance with the number of seats in contest in each district. The top-voted candidates were codified as 1 and the remaining candidates as 0. The variables incumbency and gender are also dummies. Incumbents and challengers, men and women, were codified as 1 or 0, as shown in Table 7[18]. We also included the interaction terms between finance and incumbency (finance*incumbency); finance and gender (finance*gender); incumbency and gender (incumbency*gender); and between the three elements simultaneously (finance*incumbency*gender) in order to come to hierarchically well formulated models, i.e., including all the possible components of the highest order interaction term (JACCARD 2001: 15).

In short, the model proposed in this chapter is:

logit (π)= α + β1*x1 + β2*x2 + β3*x3 + β4*x1*x2 + β5*x1*x3 + β6*x2*x3 + β7*x1*x2*x3

or

π (x)=exp (α + β1*x1 + β2*x2 + β3*x3 + β4*x1*x2 + β5*x1*x3+

β6*x2*x3 + β7*x1*x2*x3)/(1+exp (α + β1*x1 + β2*x2 + β3*x3+

β4*x1*x2 + β5*x1*x3 + β6*x2*x3 + β7*x1*x2*x3))

where:

x_1 = campaign finance,

x_2 = incumbency,

x_3 = gender.

Table 7 allows three main conclusions concerning the association between electoral finance and electoral performance, and the interaction effect of the campaign finance variable with gender and political capital on this association.

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18   This way of presenting results is based on Jaccard (2001).

The first conclusion is that, in almost every case, electoral finance shows a positive and significant association with electoral performance, but the strength of this association varies with the type of candidate.

The table shows that the strongest association between finance and performance is in the group of women challengers (subtable 7b). For this subgroup, which faces a twofold bias, against women and those with less political capital, reception of one percentage point of the campaign finance raised by all candidates running for the same office, in the same state, would increase, on average, 22.6 times the chances of a woman running for a state legislature to be among the most voted candidates and 3.3 times for women running for the federal chamber. For the case of men challengers (subtable 7c), the same increase of money would boost the likelihood of being among the most voted state legislature candidates by 12.8 times and 2 times for the case of candidates running for federal representative. In the case of incumbent women state representatives running for reelection, receiving the same increase of campaign funding would improve their likelihood of being among the most voted (subtable 7a) by 8.8 times. The only case in which the association between finance and performance was not found to be statistically significant was for incumbent women federal representatives bidding for reelection (subtable 7a). Lastly, among the incumbent candidates running both for state legislatures and the Chamber of Deputies, the above mentioned increase of funding would enhance the chance of their being among the most voted candidates by 2.1 and 1.3 times, respectively (subtable 7d).

The second conclusion is that, controlling for gender, the association between finance and electoral success tends to be more significant for challengers than for incumbents, which suggests the existence of the "Jacobson effect" also for the Brazilian case. The present study confirms, for the 2010 elections, what had been verified by the literature in previous national elections (FIGUEIREDO FILHO, 2009; LEMOS, MARCELINHO & PEDERIVA, 2010; PEIXOTO, 2010).

Among federal representative women candidates, the effect of the same increase in campaign financing is 2.8 times higher for women challengers than for women incumbents; in other words, the effect for women incumbents corresponds to 35% of the effect for women challengers (subtables 7a e 7b). As for male candidates running for this office, the impact of the same increase in funding is 1.5 times higher for challengers than for incumbents; in other words, this impact for incumbents is equivalent to 64.8% of that on challengers (subtables 7d and 7c)[19]. On the other hand, for candidates running for state

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19 In the case of candidates running for the Chamber of Deputies, the penultimate lines of subtables 7b and 7d show that the difference in impact between women challengers and incumbents (2.8 times) is 85% higher than between men challengers and incumbents (1.5 times). The penultimate lines of subtables 7a and 7c point to the same result, though from a different perspective: The difference in impact between male challengers and incumbents corresponds to 54.1% of that found between women challengers and incumbents.

deputy, the effect of the same increase in funding for challengers is 6 times higher than for incumbents or, seen from a different perspective, this effect for incumbents corresponds to 16.5% of the effect for challengers (subtables 7d and 7c). No significant contribution-related impact was verified regarding state representative women candidates, incumbents and challengers alike (subtables 7a and 7b).

The third conclusion is that, controlling for political capital, the association between finance and electoral success tends to be stronger for women than for men. Using an analogy from biology, our study suggests that the "Jacobson effect" is of a species that belongs to a broader genus. Thus, overall, the effect of finance tends to be more robust for candidates who have to come to grips with specific electoral disadvantages, whether these are linked to lower political capital, gender, and in all likelihood to other similar-effect factors not approached in this article. Electoral finance would function as a tool capable of offsetting the negative effect of other factors in terms of electoral performance.

In this regard, the table shows that, in the race for state legislature seats, the effect of the same increase of money is higher for women than for men. This is so not only among challengers, a category in which the effect is 1.7 times higher for female candidates than for male candidates, or in which the effect for the latter corresponds only to 56.7% of the effect for the former (subtables 7c e 7b). We find similar effects among incumbents, since the effect of money for women is 4.2 times higher than for men, or the effect of campaign finance for men corresponds to 23.8% of that effect for women (subtables 7d and 7a). As for the race for federal chamber seats, the effect of the same amount for women challengers is 1.6 times higher than that for men challengers, or the effect for the latter corresponds to 61.7% of the effect for the former (subtables 7c and 7b). No statistically significant difference was found with regard to the impact of the same finance for incumbent women and men (subtables 7a and 7d)[20].

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20 Upon testing the same model (multivariate, with interactions) with other forms of operationalizing the dependent and independent variables, we obtained the same results. First, we replaced the dependent variable "most voted" versus "others" with "elected" versus "not elected". Next, we replaced the independent variable "% of finance" with the Índice *de Sucesso de Receita, or* "Income Success Index", as proposed by Sacchet and Speck (2012b, p. 188), which accounts for the number of candidates in the contest. All the regression coefficients that were significant in the original model retained the same sign, indicating that the model is robust and does not depend on the operationalization of the variables. These additional tests can also be requested from the authors.

Graph 1. Logistic regression results for state deputy in 2010
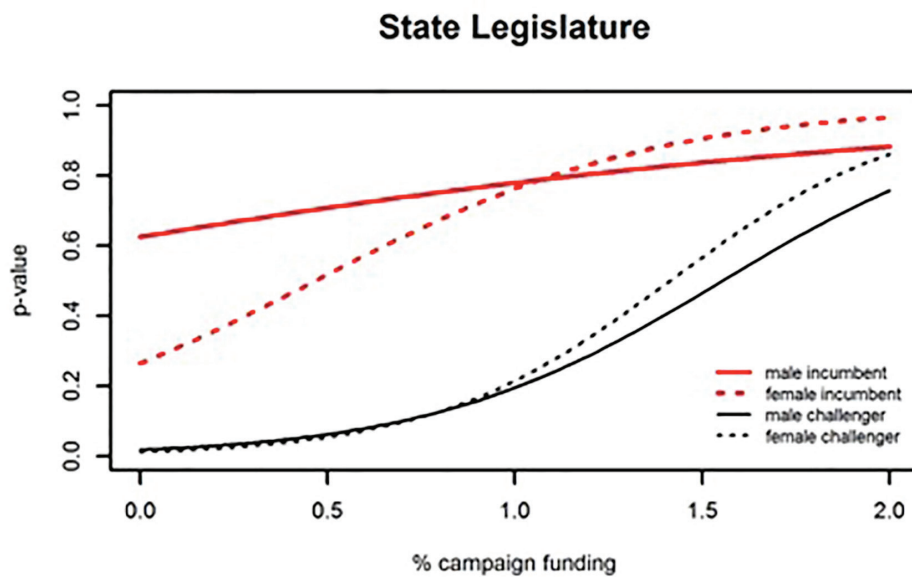
Source: Prepared by authors based on TSE data.

Graph 2. Logistic regression results for federal deputy in 2010
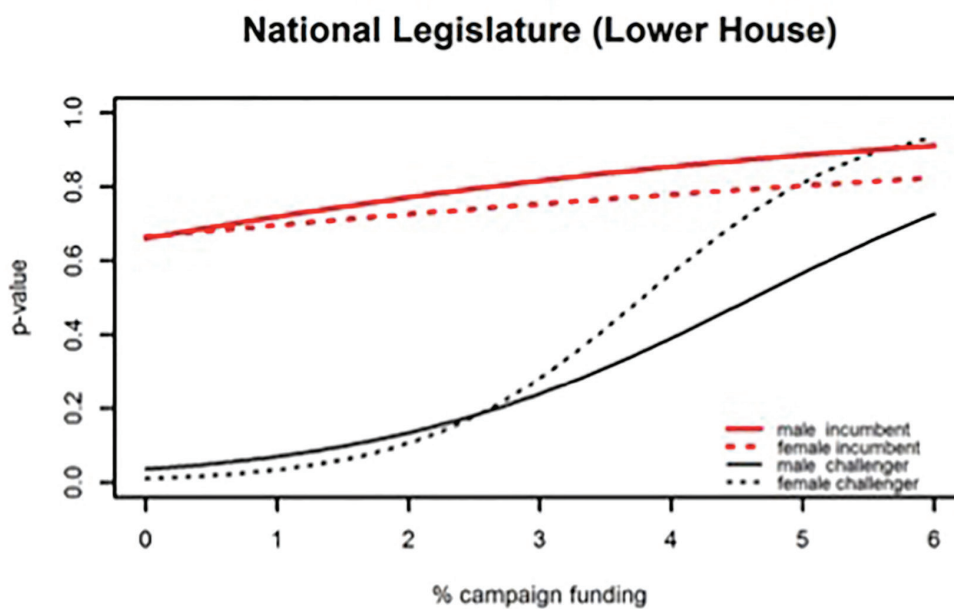
Source: Prepared by authors based on TSE data.

Graphs 1 and 2, plotted in line with the second equation mentioned earlier, allow us to visualize these results. In accordance with our hypothesis, the graphs show that receiving political finance always favors electoral performance, but the effect of this variable depends on the type of candidate. The challengers' curves tend to slope more upwards and rightwards than those of the incumbents' (there is no statistically significant difference between women challengers and incumbents running for the state legislature). Similarly, women's curves tend to be steeper than those of men. There is no significant difference between male and female incumbents running for reelection for the federal chamber. Therefore, although campaign finance is electorally useful for all types of candidates, it is capable of offsetting initial disadvantages of challengers and women.

To illustrate what was said above, let us focus precisely on women challengers, the subgroup with the worst initial prospects. The likelihood of a woman challenger with no campaign funds making it to the top-voted group is just 0.012 for state legislature candidates and 0.011 for federal chamber candidates. In the case of female state legislature candidates, raising 1% of finance would suffice to make this likelihood soar to 0.216. If finance reached 2%, the likelihood would go to 0.861 – getting quite close to that of male and female incumbents receiving the same amount of finance. The rapid growth of the likelihood of being among the top-voted candidates as a result of the percentage of finance raised is indicative that money is a powerful lever in increasing the chances of success of this electoral subgroup. In contrast, financial resources have less impact for male incumbents, though equally important for this subgroup. Male incumbents with no finance already enjoy an initial probability of being among the most voted of 0.625. For the candidates in this subgroup who get to raise 2% of finance, the likelihood increases to 0.882. It is also worth mentioning the remarkable effect of campaign funding for male challengers and women incumbents, too. Without funding, the initial likelihood of electoral success of these subgroups is, respectively, 0.019 and 0.265. With 2% funding, the likelihood goes up to 0.757 and 0.966, respectively.

The contest for seats in the federal chamber is even fiercer, which increases the ratio of finance necessary to close the gap between the likelihood of electoral success of women challengers and that of men and women incumbents. Women challengers without finance have a very low probability of electoral success (p = 0.011), whereas women and men incumbents depart from much higher levels– respectively, 0.666 and 0.661. The chances of the three subgroups begin to converge as from the 3% level of finance. With 5% finance, the chance of women challengers (0.811) outweighs that of women incumbents (0.803). If finance reached 6%, the likelihood of success of women challengers (0,934) would also surpass that of male incumbents (0.910).

Final remarks

In summary, this study found evidence that confirms, to a great extent, the three hypotheses presented in Section II. Firstly, we found a positive and significant association between political finance and electoral performance. The intensity of the association varied depending on the type of candidate, being stronger for women challengers, followed by men challengers, women incumbents (in the case of state representatives), and male incumbents. Secondly, by controlling for candidate gender, we found that the association between finance and electoral success is stronger for challengers than for incumbents – except among state representative women candidates. And thirdly, with incumbency as the control variable, we found that this association was stronger for women than for men – except among federal representative male and female officeholders running for reelection.

The findings suggest that campaign funding can function as an element that partially offsets the effect of factors associated with electoral disadvantages such as scarcity of political capital, gender discrimination, and probably other factors not analyzed in this paper.

In our view, there remain three challenges for later analysis. The first one is to sophisticate the political capital criterion adopted in studies about political finance. Thus far, the most often used political capital proxy has been incumbency, i.e., running for reelection for the same office. However, incumbency is just a specific form of political capital. Candidates running for the federal Chamber of Deputies, for example, include state representatives and mayors who also command significant political capital. Given the dichotomy adopted in studies focused on the impact of incumbency, these candidates would be classified together with the newcomers, with no experience at all. Secondly, candidates for an elective office often run in several elections without success before winning. It is reasonable to separate candidates who ran in elections in the past, yet were not successful, from other candidates without any electoral experience. Thirdly, we should also assess the effect of political capital associated with the holding of other important offices, such as high offices in the city, state or federal administration, or in party executive offices. In short, it is necessary to acknowledge the limits of incumbency as a proxy for measuring political capital which has been used extensively in literature and also in this article. In thesis, the results found in this article could be affected by variables measuring with greater precision the candidates' "quality" as stemming from their political backgrounds[21]. Once the data on the candidates' political careers is more complete and

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21 We would like to thank the anonymous reviewer for recommending emphasis on this point.

accessible, it might provide clues for future analyses on the relation between resources and success at the polls.

The second challenge is to better understand the findings in response to our initial hypotheses. With regard to state representative elections, why is the initial probability of success of women incumbents so much lower than that of men incumbents, bringing the effect of finance on women incumbents closer to that of women challengers? Concerning federal representative elections, why isn't the effect of political finance significant for women incumbents seeking reelection? And why do women and men incumbents constitute the only case where the candidate's gender does not significantly affect the impact campaign finance has on the electoral outcome?

Lastly, the third challenge is to break down the analysis and study the situation of each one of the 26 states and the Federal District separately in order to verify whether the patterns exhibited on a national basis are the same in all subnational units[22]. Should there be any significant differences between these regional contexts, researchers will have to combine sociological imagination and knowledge of each local context to come up with convincing explanations for these differences.

<div align="right">
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