Crowdfunding and electoral performance in Brazil: statistical analysis of the elections for federal deputy in 2018

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The article seeks to analyze the performance of crowdfunding as a fundraising strategy in the election campaign for the Brazilian Congress in the 2018 general elections. The article also analyzes the influence of the socioeconomic and demographic profiles of the candidates associated with the decision to adopt crowdfunding. The methodology used was logistic regression, considering the following independent variables: funds raised, education, age, race, and marital status of the candidate, in addition to the party's ideology, size, and age of the party. The binary dependent variables were: use of crowdfunding (or not) and the campaign's outcome. The data source was the Electoral Data Repository of the Brazilian Superior Electoral Court (TSE), with information from all candidates running for federal deputy in all Brazilian states in the 2018 general elections. The resulting analysis shows that crowdfunding was statistically more used by white, young, highly educated candidates from the Southern region of Brazil. There is also evidence that crowdfunding is an electoral strategy used especially by candidates from recently created parties, from the left, center-left or right (those in the center and center-right did not use crowdfunding as frequently) and larger parties. Finally, the econometric model points to an average increase of 5.55 percentage points in the probability of electoral success of candidates using crowdfunding.

Keywords: legislative elections; electoral funding; electoral campaigning; crowdfunding; Brazil.

Crowdfunding e desempenho eleitoral no Brasil: análise estatística das eleições para deputado federal em 2018

O artigo busca analisar o desempenho do financiamento coletivo (*crowdfunding*) como estratégia de arrecadação de recursos para a campanha eleitoral a deputado federal nas eleições de 2018. Também foi analisada a influência de características socioeconômicas e demográficas dos candidatos associada à decisão de adoção do financiamento coletivo como alternativa arrecadatória na campanha eleitoral. A metodologia utilizada foi a de regressão logística, considerando as seguintes variáveis independentes: valores arrecadados, escolaridade, idade, raça e estado civil do candidato, além de ideologia, tamanho e antiguidade do partido. As variáveis dependentes binárias foram: utilização ou não do *crowdfunding* e sucesso ou insucesso eleitoral. A fonte de dados foi o repositório de dados eleitorais do Tribunal Superior Eleitoral (TSE), com informações de todos os candidatos a deputado federal, de todos os estados brasileiros, no pleito de 2018. Entre os resultados obtidos, encontra-se que o *crowdfunding* foi estatisticamente mais usado por candidatos brancos, jovens, de alta escolaridade e da região Sul. Há evidências também de que o *crowdfunding* seja uma estratégia eleitoral utilizada sobretudo por candidatos de partidos de criação recente, de esquerda, centro-esquerda ou de direita – os de centro e centro-direita tiveram menor utilização –, e daqueles com maior bancada. Por fim, o modelo econométrico aponta um acréscimo médio de 5,55 pontos percentuais na probabilidade de sucesso eleitoral dos candidatos que se valeram do *crowdfunding*.

Palavras-chave: eleições legislativas; financiamento eleitoral; financiamento coletivo; *crowdfunding*; Brasil.

Crowdfunding y desempeño electoral en Brasil: análisis estadístico de las elecciones a diputado federal en 2018

El artículo busca analizar el desempeño del *crowdfunding* como estrategia de captación de fondos para la campaña electoral de diputado federal en las elecciones generales de Brasil en 2018. También se analizó la influencia de las características socioeconómicas y demográficas de los candidatos asociada a la decisión de adoptar el financiamiento colectivo como alternativa de recaudación en la campaña electoral. Se utilizó la metodología de regresión logística considerando las siguientes variables independientes: valores recaudados, nivel de instrucción, edad, raza y estado civil del candidato, además de la ideología, tamaño y antigüedad de su partido político. Las variables dependientes binarias fueron: uso o no de *crowdfunding* y éxito o fracaso electoral. La fuente de datos fue el Tribunal Superior Electoral de Brasil (TSE), con información de todos los candidatos a diputado federal en la elección de 2018. Entre los resultados alcanzados está que el *crowdfunding* fue estadísticamente más utilizado por candidatos blancos, jóvenes y de alto nivel de escolaridad y de la región sur de Brasil. También hay evidencia de que el *crowdfunding* es una estrategia electoral utilizada especialmente por candidatos de partidos de reciente creación, de izquierda, centro-izquierda o derecha (los de centro y centro-derecha registraron menos uso) y tamaño de los partidos políticos. Finalmente, el modelo econométrico apunta a un aumento promedio del 5,55 puntos porcentuales en la probabilidad de éxito electoral de los candidatos que utilizaron el *crowdfunding*.
Palabras clave: elecciones legislativas; financiación electoral; recaudación de fondos; *crowdfunding*; Brasil.

ACKNOWLEDGMENTS

1. INTRODUCTION

Crowdfunding can be defined as the activity of mobilizing people to raise funds for a project (Kusuramani & Zo, 2019). It has been used as a fundraising strategy for social and political projects and causes, to fund new technologies, and launch ideas, products, services, and organizations (Amedomar, 2015; Monteiro, 2014).

Political crowdfunding is the process where many individuals give small amounts of money to support a political campaign (Idea, 2018; Sokolov, 2015). This strategy has gained attention in many countries, especially with the recent dissemination of online platforms that facilitate making and receiving donations.

The potential benefits of political crowdfunding in elections are increased transparency, reduced electoral corruption, overcoming economic groups or large donors taking over parties and politicians, fostering democratic values, promoting equal competition, and increasing active citizenship (Idea, 2018; Mohallem & Costa, 2015; Santano, 2016). Donors' motivation to engage in political crowdfunding is also a research topic, with studies concluding that donors give based on alignment with the party/candidate's worldview, trust, reward, acknowledgment, sense of belonging, quality of ideas/proposals, among others (Kusuramani & Zo, 2019).

Studies in several countries have also explored the relationship between collective engagement in political campaigns and its influence on the electoral performance of the candidate, list of candidates, or party that uses the crowdfunding strategy (Bonneau, 2007; Hindman, 2005; Sebold, Limbocker, Dowdle & Stewart 2012).

In Brazil, political crowdfunding emerged in the 2016 municipal elections. The most successful example of this strategy was the candidate for mayor of Rio de Janeiro, Marcelo Freixo (Psol party). Small donors were able to give through the candidate's online platform, which facilitated the collection of BRL 1.8 million from 14,022 donors in the two rounds, with an average donation of BRL 129.86 (Bando, 2020). However, the dissemination of crowdfunding among candidates was restricted since the electoral legislation did not allow intermediaries between the donor and the candidate/party, forcing each campaign to build its own crowdfunding platform.

In 2017, Law 13488 regulated political crowdfunding for the elections, allowing companies to provide services to facilitate online fundraising for candidates. This legislation was based on the Superior Electoral Court (TSE) Resolution 23553/2017 that allowed companies to apply and obtain authorization to offer candidates online crowdfunding platforms following legal and technical requirements. Therefore, the 2018 general elections were the first in the country to widely use this funding strategy, with the participation of legally authorized online platforms mediating the donation process between individual donors and candidates.

This study analyzes the relationship between political crowdfunding and the chances of success in the 2018 Brazilian federal deputy elections. In addition, it investigates possible socioeconomic and demographic characteristics associated with the candidates who decided to adopt crowdfunding in their campaign.

The logistic regression method was used to estimate the probabilities of using crowdfunding and electoral success. Alternative estimates considering crowdfunding a quantitative variable (amount collected) were also carried out to verify the robustness of the results. The data source was the TSE's electoral data repository, limited to the electoral process for federal deputy in the 2018 elections, the first to have crowdfunding regulated by legislation, which, so far, is the only one with complete information on electoral accountability associated with crowdfunding. This selection was justified because it is the first Brazilian general election in which corporate donations were prohibited, motivating many candidates to seek other sources of funds besides party and electoral funds.

2. FINANCING ELECTORAL CAMPAIGNS IN BRAZIL

According to Speck, political campaigns require "material resources used by competitors in popular elections to organize the campaign and convince citizens to vote for them" (Speck, 2007, p. 154, our translation). These resources may come from government funds designated to finance elections, private donors, or both. In addition, political funding can be classified as direct – through financial donations – or indirect – when candidates receive advantages or pro-bono services (when indirect, the benefit received must be quantified, and its estimated cost registered and presented to electoral authorities).

According to Sacchet and Speck (2012), financial resources play a crucial role in an election's success in Brazil. Studies analyzing the relationship between funds raised for a campaign and electoral performance demonstrated a strong association between the two elements, which stimulates candidates to seek money as a fundamental instrument to win an electoral race (Cervi, 2013; Mancuso & Speck, 2015).

Sallaberry and Flach (2019) applied a logistic regression model to identify the correlation between the total funds raised in the 2014 and 2018 general elections in Brazil and the candidates' respective electoral performance. The authors observed that the funds raised – economic power – is the most influential factor in electoral success compared to other variables such as age, gender, marital status, or being an incumbent running for re-election.

However, there are many imperfections in the correlation between economic and political power, particularly concerning the basic values of democracy and justice. According to Speck (2007), political campaign financing in Brazil is one of the causes of corruption. The author demonstrates how campaign funds are illegally collected, conceptually analyzing the parallels and differences between corruption for private and political purposes. The study suggests that better regulation of political campaign financing can contribute to the fight against corruption, bringing more transparency to the entire electoral process.

Studies on why donors give to political campaigns, particularly via crowdfunding, have indicated that this strategy increases donor engagement, sense of belonging, and positive effects on trust and perception of the quality of the candidate's proposals (Kusuramani & Zo, 2019). Thus, the candidates' decision to use crowdfunding can impact their donors' motivation and engagement.

The so-called Law of Elections passed in Brazil in 1997 (Law 9504/97) listed various funding sources for political campaigns. Political parties and candidates could count on contributions from individuals, corporations, government funding designated to party activities, and the candidates' personal resources.

Corporate donations were the predominant source of funding for political campaigns in Brazil until 2014, which resulted in distortions and risks to democracy, such as imbalance of electoral forces, pragmatic investment in parties and candidates that committed to pay back the company through government contracts after electoral success, other forms of corruption, and electoral capture (Mancuso, Horochovski & Camargo, 2016; McMenamin, 2012; Santos, 2009; Zovatto, 2005). On the other hand, it is not possible to argue that replacing corporate donations with public funding for political campaigns would prevent electoral corruption. According to Rubio, "the effect of public funding as an antidote to corruption lacks sufficient empirical corroboration" (Rubio, 2005, p. 10, our translation).

As of 2015, corporate donations were prohibited by the Brazilian Supreme Court, which ruled this source unconstitutional for violating the elections' normality and legitimacy. This decision brought a series of challenges to political campaigns, especially for the 2016 municipal elections.

In 2017, the National Congress passed Law 13488/2017 to compensate for the loss of this funding source, establishing the *Fundo Especial de Financiamento de Campanha* (FEFC) (special campaign financing fund), which allocated government funds to political campaigns. The law also regulated political crowdfunding allowing candidates to raise funds from individuals via online platforms. Without corporate money, FEFC became the predominant funding source for electoral campaigns. The resources from FEFC are divided among the parties according to their representation in the National Congress, and they distribute their share internally following their own criteria. For the 2018 elections, the amount distributed was BRL 1.7 billion.

Law 9504/1997 already authorized the contribution of individuals to political campaigns to the limit of 10% of the donor's gross income in the year prior to the election. After the prohibition of

corporate donations in 2015 and witnessing an increase in individual giving, parties and coalitions sought new forms of attracting and processing individual donations.

Thus, Law 13488/2017 provided that private entities could offer online services and electronic applications to mediate the financial transaction between donors and political campaigns. According to the law, this fundraising strategy is exclusively online, entities providing such transaction platforms must be registered with the electoral authority and follow specific criteria, and donors must be fully identified. Therefore, the 2018 general elections consolidated the strategy of political crowdfunding in Brazil.

With the changes in the rules around funding political campaigns, Brazil now presents a mixed profile, combining public and private money from five sources: the candidates themselves, political parties, the public fund FEFC, individuals – including via political crowdfunding – and from other candidates in that election (for example, a candidate for federal deputy can donate to a candidate for state deputy). There are maximum fundraising ceilings set for each position. In 2018, for example, candidates for a seat in the national Chamber of Deputies could raise and spend a maximum of BRL 2.5 million. For individual giving through online crowdfunding platforms, the TSE Resolution 23553/2017 established a daily ceiling of BRL 1,064.10 per donor. All revenues and expenses in political campaigns must be registered and declared to the electoral judicial authority, the Regional Electoral Courts (TREs), under penalty of incurring an electoral crime.

In this study examining the political campaigns for federal deputy in the 2018 Brazilian general elections, the working definition for political crowdfunding is "financial resources donated by individuals to candidates, via online platforms accredited by the TSE, in all states, during the period established by law (comprising a period before the formal candidate register – called pre-campaign, and after – actual campaign). Thus, economic (non-financial) donations, those made to political parties, those over the daily ceiling for donations made via online platforms, or those made directly to the candidate via the campaign's bank account, are not part of the study object. The following sections present the methodology and the data collected and the application of statistical instruments to verify the relationship among the variables of political crowdfunding and electoral performance considering the 2018 general elections in Brazil, focusing on candidates running for a seat in the Chamber of Deputies.

3. METHODOLOGY AND DATA

The methodology sought to analyze the relationship between political crowdfunding and electoral success in the 2018 elections for a seat in the Chamber of Deputies. In addition, possible socioeconomic and demographic characteristics associated with the candidate's decision to use crowdfunding as a fundraising strategy were investigated.

Data were collected from the repository of the Electoral Supreme Court's (TSE), gathering information of all candidates running for federal deputy in the 2018 elections in all Brazilian states. The database returned 8,588 observations. Considering only the candidates who had all the information of interest disclosed, the sample totaled 7,484 observations.

The primary empirical strategy was the logistic regression methodology using the Stata software. This form of estimation is recommended in cases where the dependent variable is binary (dummy), as

it allows the direct calculation of probabilities of a given event as a function of independent variables. The logistic regression methodology is well consolidated in the empirical literature on predicting electoral success (Dias, Nossa & Monte-Mor, 2018; Dufloth, Horta, M. M. Silva, Costa & Rocha, 2019; Sallberry & Flach, 2019).

In this study, the binary dependent variables indicated whether the candidate used crowdfunding and whether they were elected for the position of federal deputy in 2018. The first regression has a dependent variable, which assumed a value of 1 if the applicant used crowdfunding, and 0 otherwise. In the second specification, the dependent variable assumed 1 if the candidate was elected and 0 if not elected. In the case of the second regression, the crowdfunding dummy variable was used as the explanatory variable of interest. Alternative specifications were tested to check the robustness of the results, considering crowdfunding as a quantitative variable (value collected). The other independent variables, present in both regressions, are shown in Box 1.

BOX 1   EXPLANATORY VARIABLES

Explanatory variable	Description
Crowdfunding	Dummy indicating whether the candidate used crowdfunding.
Party less than 5 years-old	Dummy indicating whether the party was created after 2015 (considering the date of registration).
Party political spectrum	Dummies indicating whether the party is left-wing, center-left, center, center-right, or right-wing.
Parties forming the coalition	Number of parties in the coalition supporting the candidate's party.
Party's size	Number of party candidates elected for federal deputy in 2014.
Incumbent running for re-election	Dummy indicating whether the candidate is an incumbent running for reelection.
Campaign revenue (in BRL 1,000,000.00)	Total campaign revenue as declared to electoral authorities.
Years of schooling	Number of years of candidate's schooling.
Age	The candidate's age (in years).
White	Dummy indicating whether the candidate is white.
Married	Dummy indicating whether the candidate is married.
Brazilian state fixed effect	Dummies indicating the Brazilian state where the candidate is running.

Source: Elaborated by the authors.

Among the explanatory variables, the party political spectrum deserves to be detailed. Parties were classified following Tarouco and Madeira (2015), who categorized Brazilian political parties based on a survey conducted with political scientists affiliated with *Associação Brasileira de Ciencia Política* (ABCP) (a Brazilian organization devoted to political science). The adopted scale classified the existing parties in 2010 on a scale from 1 (far left-wing) to 7 (far right-wing). Based on this scale by Tarouco and Madeira (2015), this study established the cut-off lines between the five categories of interest: left-wing (1 to 2.2), center-left (2.3 to 3.9), center (4 to 5), center-right (5.1 to 5.9), right-wing (6 to 7). These cut-off lines were established arbitrarily in an attempt to maintain an intuitive distribution that was closer to the normal, with fewer splits at the extremes and a greater quantity at positions close to the center. The details of this classification can be found in the Appendix.

For parties that were not classified by Tarouco and Madeira (2015) and parties recently created, merged, or incorporated, we performed an autonomous categorization based on studies by Scheeffer (2018), Zucco and Powell (2021), and on reading the parties' statutes and manifestos. This categorization resulted in the following distribution of the parties:

- Left-wing: PCO, PSTU, Psol, PCB, and UP.
- Center-left: PCdoB (incorporating the PPL), PT, PSB, PDT, PROS, and PV.
- Center: Avante, PSDB, MDB, Cidadania, Rede, PMN, PTB, SD, and PMB.
- Center-right: PTC, Podemos (incorporating the PHS), Republicanos, PSC, PRTB, DC, PL, Patriota (incorporating the PRP), and PSD.
- Right-wing: PP, DEM, PSL, Novo.

The equations used to estimate the probabilities of the dependent variables in this study are:

$$Crowdfunding_i = \alpha_1 + \beta X_i + \theta_i + \varepsilon_{1i} \tag{1}$$

$$Elected_i = \alpha_1 + \alpha_2 Crowdfunding_i + \beta X_i + \theta_i + \varepsilon_{2i} \tag{2}$$

where, *Crowdfunding*$_i$ is a dummy variable that takes the value 1 if the candidate for federal deputy *i* has used the crowdfunding strategy in the 2018 election campaign; X_i represents the vector of observable characteristics of candidate *i*, presented in Box 1; θi is the Brazilian state fixed effect; and ε_{1i} is the random error term. Regarding the second equation, the dummy variable *Elected*$_i$ assumes value 1 if the candidate for federal deputy was elected in 2018, while ε_{2i} represents the error term of the second estimation. Both specifications were modeled by logistic regression that uses maximum likelihood as an estimation method.

4. RESULTS

This section presents the study's empirical results. First, a descriptive analysis of the data is performed, followed by the presentation and discussion of the results of the estimated logistic regressions.

4.1 Descriptive Statistics

Table 1 presents the descriptive statistics of the sample of candidates for federal deputy in the 2018 elections. The sample was divided into those who used and those who did not use crowdfunding during the campaign. The descriptive analysis proposed here does not seek to test statistical significance but to find punctual differences of means and proportions (case of binary variables). More in-depth statistical analyzes will be carried out in the next subsection.

First, it appears that only 11% (813/7,484) of the candidates used crowdfunding. This group of candidates raised an average of BRL 6,000 each through this funding strategy.

Regarding the profile of candidates who used crowdfunding, compared to those who did not use this strategy, it was observed a higher proportion of parties operating for less than 5 years (25% versus 5%), left-wing (11% versus 8%), center-left (29% versus 22%) and right-wing (29% versus 11%). Candidates from larger parties with greater representation in the Chamber of Deputies and with fewer parties in the coalition were more likely to use the campaign crowdfunding strategy. While the average party caucus of those candidates who used crowdfunding was 19.86 Federal Deputies per party, for candidates who did not use crowdfunding, the average size of their party's caucus in the Federal Chamber was 16.27. Likewise, candidates who used crowdfunding belonged to electoral coalitions with an average of 1.79 parties, while those who did not use crowdfunding belonged to coalitions with an average of 1.87 parties. Finally, candidates for re-election were more likely to use crowdfunding (12% versus 5%).

The total campaign revenue of the candidates for federal deputy in 2018 present in the sample was about BRL 1.3 billion, with crowdfunding counting approximately BRL 5.2 million. On average, crowdfunding revenue represented 10% of the total revenue of each candidate who used this strategy. Although crowdfunding is still not significant compared to other sources, it is, on average, more common for those with the highest total campaign revenue (BRL 331,000 versus BRL 164,000).

The social profile of candidates who used crowdfunding is shown in Table 2. Descriptive statistics indicate that those who used the strategy were, on average, more educated (14.47 years of schooling versus 12.95) and younger (47.39 versus 48.34) when compared with those who did not use crowdfunding. They were also white (73% versus 58%) and married (58% versus 55%).

TABLE 1   **DESCRIPTIVE STATISTICS**

	Variable	With crowdfunding		Without crowdfunding	
		Mean	Standard deviation	Mean	Standard deviation
Binary variables	Party less than 5 years-old	0.25	0.43	0.05	0.22
	Left-wing party	0.11	0.32	0.08	0.27
	Center-left party	0.29	0.45	0.22	0.42
	Center party	0.19	0.39	0.24	0.43
	Center-right party	0.12	0.32	0.36	0.48
	Right-wing party	0.29	0.45	0.11	0.31
	White	0.73	0.45	0.58	0.49
	Married	0.58	0.49	0.55	0.50
	Incumbent running for re-election	0.12	0.32	0.05	0.21
	Parties forming the coalition	1.79	2.21	1.87	2.10
	Party's size	19.86	25.47	16.27	20.73
Quantitative variables	Campaign's Crowdfunding revenue (in BRL 1,000,000.00)	0.006	0.014		
	Campaign net revenue (in BRL 1,000,000.00)	0.331	0.523	0.164	0.418
	Crowdfunding revenue/ Total revenue	0.10	0.15		
	Years of schooling	14.47	1.53	12.95	2.76
	Age	47.39	11.74	48.34	11.40
	Observations	813		6,671	

Source: Elaborated by the authors.

4.2 Determinants of using crowdfunding

The descriptive data analysis allows us to suggest some hypotheses about the profile of candidates who used crowdfunding. Based on these preliminary relationships, a logistic regression model was built, according to equation (1), which estimates the probabilities associated with each determinant in isolation. The results of the marginal effects of each determinant are shown in Table 2.

According to estimates, the only variables that do not statistically affect the likelihood of using crowdfunding are the variables identifying whether the candidate belongs to a center-right party, if the candidate is incumbent seeking re-election, and if the candidate is married. All other variables analyzed are statistically significant, with at least a 10% significance level.

The mean marginal effects of the logistic regression indicate that candidates who competed for parties active for less than 5 years have an increase of 31.81 percentage points (pp) in the probability of using crowdfunding. As for the political spectrum, candidates from left-wing, center-left, and right-wing parties are more likely to use crowdfunding, 21.76, 10.78, and 12.53 pp, respectively, compared to center parties. The dummy variable that identifies center parties was removed from the model as it is the reference category. Similarly, candidates from larger parties, with more parties in their coalition, campaigns with higher revenues, more years of schooling, younger, and White, are more likely to use crowdfunding. The same specification was tested with campaign revenue discounting crowdfunding, with no sign or magnitude changes in the estimates, suggesting that a possible endogeneity of the independent variable does not alter the interpretations.

**TABLE 2**   **RESULT OF ESTIMATION FOR DETERMINANTS OF USING CROWDFUNDING**

Marginal effect (Standard error) –logistic regression			
Dependent variable: probability of electoral success – Pr(elected)			
Party less than 5 years-old	0.3181*** (0.0255)	Party's size	0.0226 (0.0182)
Left-wing party	0.2176*** (0.0280)	Incumbent running for re-election	0.0401*** (0.0087)
Center-left party	0.1078*** (0.0142)	Campaign net revenue (in BRL 1,000,000.00)	0.0231*** (0.0027)
Center-right party	0.0102 (0.0140)	Years of schooling	-0.0009*** (0.0003)
Right-wing party	0.1253*** (0.0169)	Age	0.0189** (0.0075)
Parties forming the coalition	0.0040** (0.0020)	White	0.0098 (0.0067)
Party's size	0.0011*** (0.0002)		
Brazilian state fixed effect	Yes		
Pseudo-R2	0.2058		
Observations	7,484		

Notes: Estimated marginal effects and robust standard errors in brackets.
Statistical significance: * P-value < 0.1; ** P-value < 0.05; *** P-value < 0.01.
Source: Elaborated by the authors.

The results in Table 2 help to understand the determinants of a candidate's choice to use crowdfunding. Logistic regression allows analyzing possible heterogeneous and nonlinear effects of these determinants.

The empirical exercise in Graph 1 seeks to capture non-linear relationships between the determinants "party orientation" and "years of schooling." The graph shows that the more educated the candidate, the more likely they are to use crowdfunding. This effect seems to be accentuated when the candidate is from left-wing, center-left, and right-wing parties. For example, a candidate with a degree (15 years of schooling) and from a left-wing party is 25 percentage points (pp) more likely to use crowdfunding than a candidate from the center with the same level of education. When compared with a center-left or right-wing candidate, the difference is lower than 15 pp. For lower levels of education, the party's political spectrum does not seem to have this impact. However, it is important to emphasize that there is no significant difference – analyzed by the 95% confidence intervals – between the results for the center-left and right-wing parties within each year of schooling.

GRAPH 1   **DETERMINANTS OF USING CROWDFUNDING: PARTY POLITICAL SPECTRUM AND YEARS OF SCHOOLING**
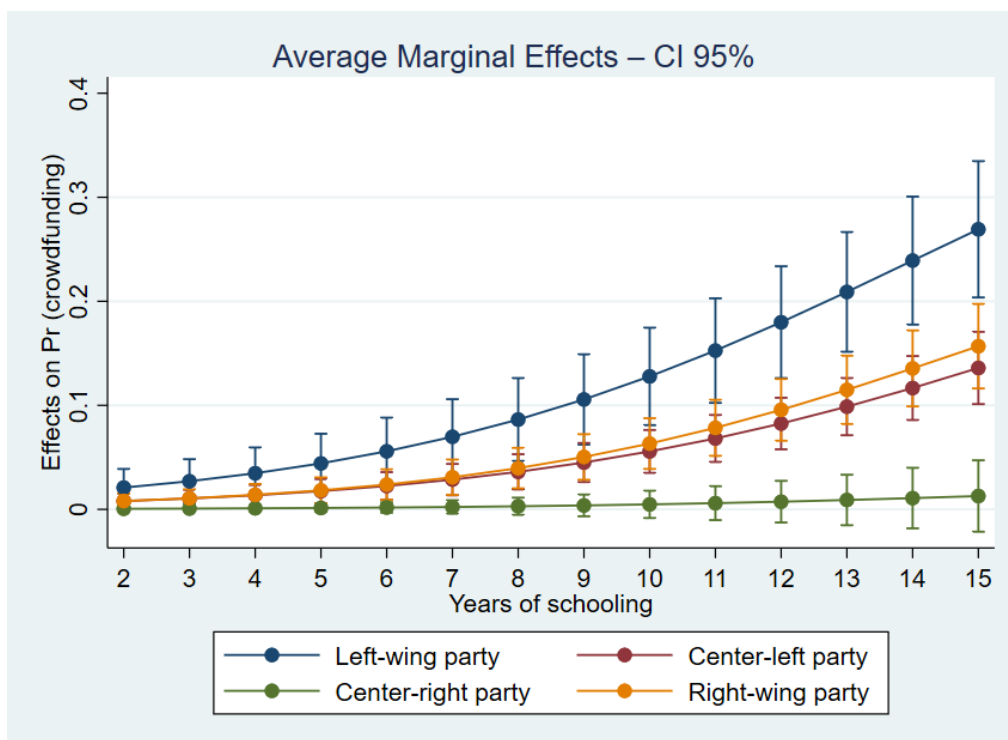
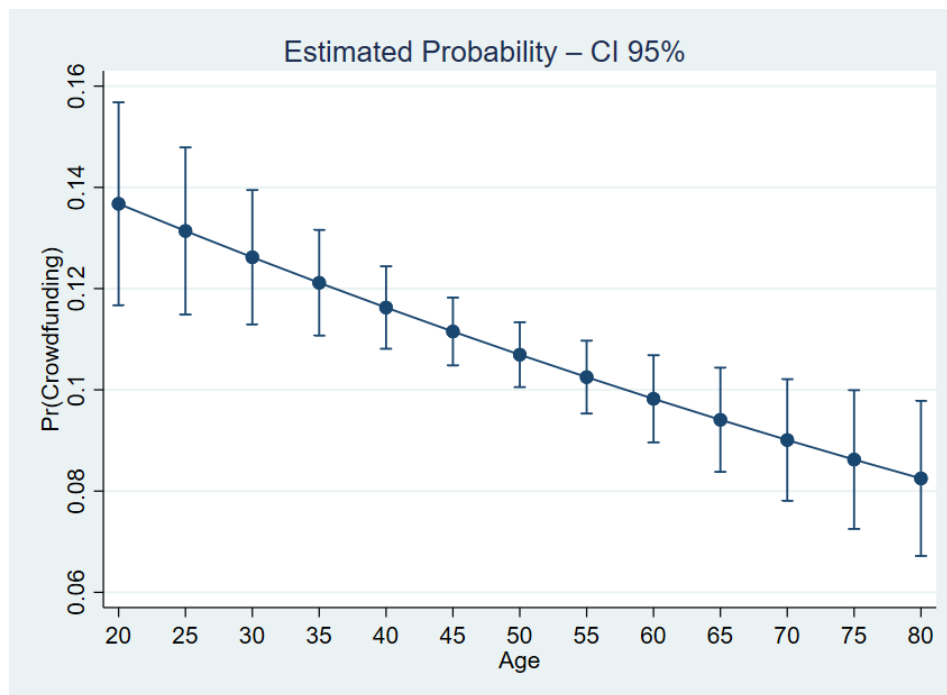**Source:** Elaborated by the authors.

Graph 2 presents another empirical exercise, considering the probability of using crowdfunding estimated per country region. Candidates from the North region are the least likely to use crowdfunding (a little over 5%), while the candidates from the South region present a 17.5% probability. It appears that the estimated likelihood of using crowdfunding is higher for candidates from the South and Central-West, and the differences in comparison to other regions are statistically significant.

GRAPH 2   ESTIMATED AVERAGE OF THE PROBABILITIES OF USING CROWDFUNDING, PER REGION OF BRAZIL
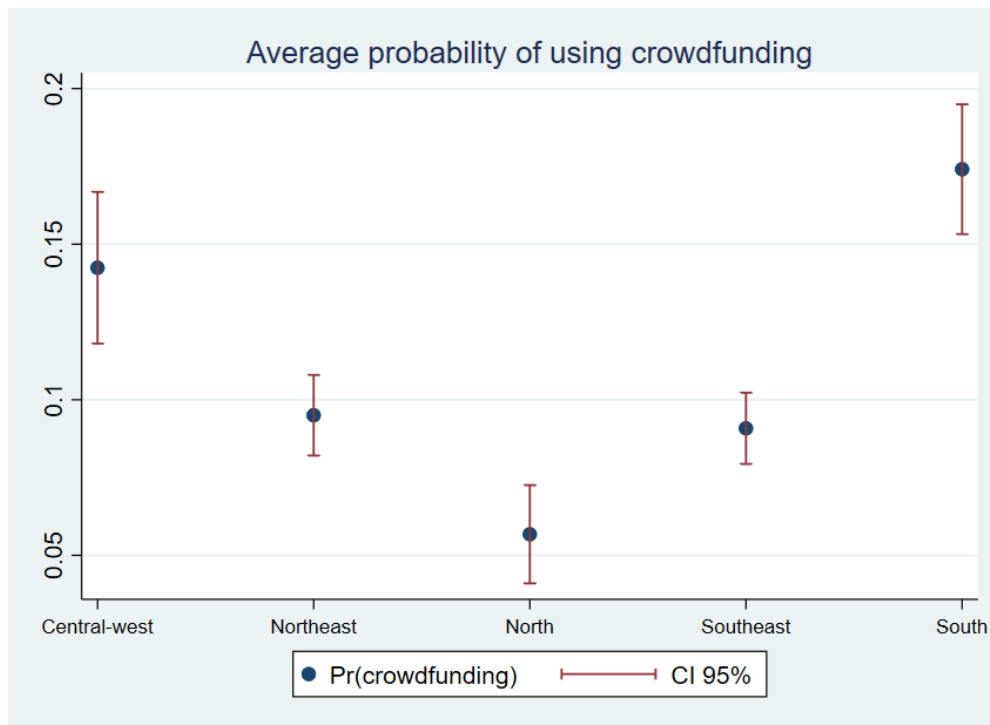
Source: Elaborated by the authors.

Finally, based on the model shown in Table 2, the last empirical exercise analyzes possible heterogeneities in the relationship between the probability of using crowdfunding and the candidate's age. Graph 3 presents these results. It appears that the candidate's age is inversely related to the chance of using crowdfunding. For example, a 20-year-old candidate has, on average, a 14% chance of using crowdfunding, while an 80-year-old candidate would have about 8%. These differences are statistically significant.

GRAPH 3   **ESTIMATED AVERAGE OF THE PROBABILITIES OF USING CROWDFUNDING, PER AGE**

Source: Elaborated by the authors.

Although the main objective of this subsection is to analyze the profile of the candidates who used crowdfunding, an alternative empirical exercise is to estimate the determinants of success when adopting this strategy. Table 3 presents the empirical strategy's coefficients – estimated by ordinary least squares (OLS) – that seek to explain fundraising via crowdfunding. The same independent variables from the model shown in Table 2 are used, replacing the campaign revenue with the net revenue, which discounts the revenue obtained via crowdfunding. The sample was restricted to only 813 candidates who used crowdfunding.

According to the estimates presented in Table 3, younger, white, left-wing candidates and those with higher net campaign revenue were more successful in crowdfunding. These same variables had already been shown to be significant predictors of a candidate's probability of using crowdfunding (Table 2). However, candidates running for re-election and belong to center-right parties – characteristics that were not related to the probability of using crowdfunding (Table 2) – seem to present a poorer performance when adopting this fundraising strategy.

TABLE 3   RESULT OF THE ESTIMATION FOR THE DETERMINANTS OF USING CROWDFUNDING

Coefficients – OLS			
Dependent variable: using crowdfunding (in BRL)			
Party less than 5 years-old	941.89 (1682.23)	Incumbent running for re-election	-5338.21* (3004.82)
Left-wing party	5512.60** (2366.28)	Campaign net revenue (in BRL 1,000,000.00)	8462.04*** (2308.49)
Center-left party	1047.38 (1306.89)	Years of schooling	269.31 (241.48)
Center-right party	2971.71** (1374.66)	Age	-123.95*** (47.18)
Right-wing party	2449.64 (1495.10)	White	2507.83*** (941.65)
Parties forming the coalition	66.97 (235.14)	Married	-865.42 (1041.34)
Party's size	-30.58 (19.61)	Constant	-1204.16 (4796.42)
Brazilian state fixed effect		Yes	
R2		0.1182	
Observations		813	

Notes: Estimated coefficients and robust standard errors in brackets. Sample limited to candidates that used crowdfunding.
Statistical significance: * P-value < 0.1; ** P-value < 0.05; *** P-value < 0.01.
Source: Elaborated by the authors.

4.3 Crowdfunding and electoral performance

Previous research on the determinants of electoral performance in Brazil have focused on candidates seeking a position in the executive branch (Cavalcante, 2015, 2016; Dias et al., 2018; Dufloth et al., 2019; I. F. A. L. Fernandes & G. A. A. L. Fernandes, 2017; Sallaberry & Flach, 2019). Among the determinants with a positive influence are the search for re-election, fiscal performance, public investment in periods close to the election, in addition to personal attributes such as the candidate's gender and profession.

This study expands the research agenda by analyzing candidates seeking a seat in the legislative branch, incorporating the influence of the crowdfunding strategy. In this sense, the question is: does crowdfunding increase the chances of electoral success? The model proposed in equation (2) tests

this hypothesis by isolating the effects of other observed characteristics. The results of the average marginal effects of each candidate's characteristics on the probability of being elected to a seat in the Brazilian Chamber of Deputies are presented in Table 4.

TABLE 4 **RESULT OF ESTIMATION FOR THE EFFECT OF CROWDFUNDING ON THE PROBABILITY OF ELECTORAL SUCCESS**

Marginal effect (Standard error) –logistic regression			
Dependent variable: probability of electoral success – Pr(elected)			
Funds raised via crowdfunding (in BRL)	0.0555*** (0.0099)	Party's size	-0.00001 (0.0001)
Party less than 5 years-old	-0.0398*** (0.0083)	Incumbent running for re-election	0.0551*** (0.0138)
Left-wing party	0.0050 (0.0144)	Campaign net revenue (in BRL 1,000,000.00)	0.0829*** (0.0052)
Center-left party	0.0388*** (0.0099)	Years of schooling	0.0029** (0.0013)
Center-right party	0.0217** (0.0091)	Age	-0.0014*** (0.0002)
Right-wing party	0.0723*** (0.0165)	White	0.0074 (0.0054)
Parties forming the coalition	0.0033*** (0.0012)	Married	0.0162*** (0.0049)
Brazilian state fixed effect		Yes	
Pseudo-R2		0.4301	
Observations		7,484	

Notes: Estimated marginal effects and robust standard errors in brackets.
Statistical significance: * P-value < 0.1; ** P-value < 0.05; *** P-value < 0.01.
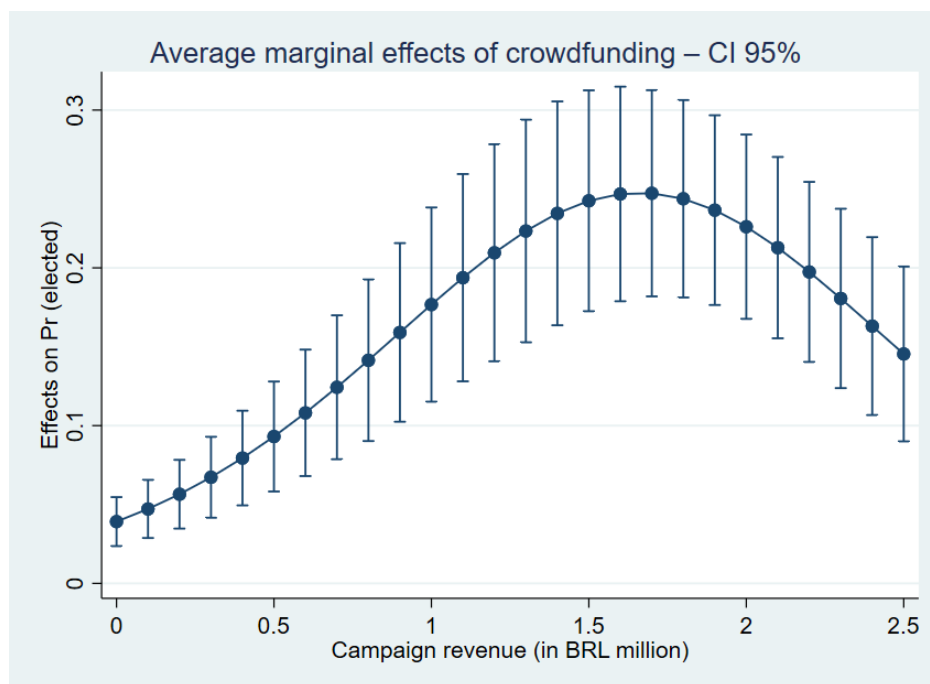**Source:** Elaborated by the authors.

The variable of interest is the dummy of using crowdfunding. The result indicates that the probability of electoral success is, on average, 5.55 pp higher for candidates who use this strategy to finance the political campaign. This estimate controls the impact of other explanatory variables. In other words, for the same amount of revenue raised in a campaign, same party and political spectrum, same age, and so on, the strategy of using crowdfunding is positively associated with electoral success.

This relationship can be more easily understood by observing Graph 4, which shows the effect of using crowdfunding on the probability of electoral success, considering different amounts of campaign

revenues. The use of crowdfunding, as already indicated, increases electoral chances. However, this result can be enhanced based on the total amount raised. For example, a candidate who raised BRL 1.7 million and used crowdfunding has approximately 25 pp more chances of electoral success. Hypotheses arise that the financial contribution from individuals to political campaigns may have an engaging effect, making the donor feel part, co-producer of the campaign, and co-responsible for electoral success. Another hypothesis is that crowdfunding has an argumentative power in voters' perception, supporting an electoral marketing narrative of a candidate that counts on many donors instead of using public resources (FEFC), resources from the political party, and self-financing their own campaign.

However, the positive effect of crowdfunding has no linear relationship for different amounts of total campaign revenue. The estimates show that the impact of crowdfunding on the probability of electoral success peaks for campaign revenues of around BRL 1.7 million. This result does not mean that there is an optimal campaign fundraising point. It suggests that the effect of crowdfunding on electoral success diminishes for campaigns that raise substantial amounts of funds.

GRAPH 4   EFFECTS OF USING CROWDFUNDING ON THE PROBABILITY OF ELECTORAL SUCCESS, PER LEVEL OF REVENUE IN THE ELECTORAL CAMPAIGN

Source: Elaborated by the authors.

With regard to the other variables in the model, being an incumbent running for reelection is one of the factors that most increase the chances of electoral success (5.5 pp), which is a result also found by Sallaberry and Flach (2019). In general, candidates with more years of schooling, younger,

married, from older parties, from the center or left-wing, candidates with more parties in the coalition, and who raised more funds are more likely to be elected to the position of federal deputy. According to estimates, the candidate's race and the caucus size in the Chamber of Deputies do not have a significant relationship with electoral success.

Another possible analysis to offer robustness to the evidence found is related to the effect of the amount raised via crowdfunding on electoral success. For this purpose, we estimate the same specification as in Table 4, changing only the qualitative variable of crowdfunding by a variable of funds raised via crowdfunding and a variable of total campaign revenue minus the funds raised via crowdfunding (campaign net revenue). The result of this specification is shown in Table 5, both for the sample of candidates who used crowdfunding and for the full sample.

The results presented in Table 5 indicate that the amount raised via crowdfunding is also a predictor of electoral success. The estimated marginal effect for this variable indicates that, on average, raising BRL 1,000.00 means an increase of 0.3 pp in the probability of electoral success when analyzing only candidates that used crowdfunding. For the full sample, this estimate is similar: 0.2 pp. The other variables of the models presented in Table 5 are in line with the evidence already obtained in the specification in Table 4.

TABLE 5   **RESULT OF THE ESTIMATION FOR THE EFFECT OF CROWDFUNDING ON THE PROBABILITY OF ELECTORAL SUCCESS**

Marginal effect (Standard error) –logistic regression					
Dependent variable: probability of electoral success – Pr(elected)					
(1)			(2)		
Funds raised via crowdfunding (in BRL)	Party's size		Funds raised via crowdfunding (in BRL)	Party's size	
0.000003***		0.0004	0.000002***		0.0001
(0.000001)		(0.0005)	(0.0000004)		(0.0001)
Party less than 5 years-old	Incumbent running for re-election		Party less than 5 years-old	Incumbent running for re-election	
-0.1553***		0.2019***	-0.0362***		0.0599***
(0.0346)		(0.0686)	(0.0095)		(0.0142)
Left-wing party	Campaign net revenue (in BRL 1,000,000.00)		Left-wing party	Campaign net revenue (in BRL 1,000,000.00)	
0.1605*		0.1550***	-0.0001		0.0795***
(0.0881)		(0.0336)	(0.0147)		(0.0050)
Center-left party	Years of schooling		Center-left party	Years of schooling	
0.2159***		0.0006	0.0422***		0.0034**
(0.0670)		(0.0053)	(0.0099)		(0.0013)

Marginal effect (Standard error) –logistic regression						
Dependent variable: probability of electoral success – Pr(elected)						
(1)				(2)		
Center-right party	0.1998** (0.0812)	Age	-0.0021** (0.0011)	Center-right party	0.0218** (0.0090)	Age	-0.0013*** (0.0002)
Right-wing party	0.3413*** (0.0768)	White	0.0265 (0.0252)	Right-wing party	0,0717*** (0.0167)	White	0.0073 (0.0054)
Parties forming the coalition	0.0002 (0.0062)	Married	-0.0300 (0.0223)	Parties forming the coalition	0.0033*** (0.0012)	Married	0.0174*** (0.0048)
Sample	Only candidates that used crowdfunding			All candidates		
Brazilian state fixed effect	Yes			Yes		
Pseudo-R2	0.3832			0.4296		
Observations	791			7,484		

Notes: Estimated marginal effects and robust standard errors in brackets.
Statistical significance: * P-value < 0.1; ** P-value < 0.05; *** P-value < 0.01.
Source: Elaborated by the authors.

5. CONCLUSION

This study analyzed the relationship between political crowdfunding and electoral success in the 2018 Brazilian general elections, examining data from candidates running for a seat in the Chamber of Deputies. The analysis considered the candidates' socioeconomic and demographic characteristics associated with their decision to use crowdfunding to finance their political campaigns.

The international literature (Bonneau, 2007; Hindman, 2005; Sebold et al., 2012) and research carried out in Brazil (Cervi, 2013; Mancuso & Speck, 2015; Sacchet & Speck, 2012) found evidence of the influence of funds raised in a political campaign on electoral success. This research contributed to this topic in political science by focusing on the influence of political crowdfunding as a novelty in the Brazilian context, assessing whether the use of crowdfunding influences the electoral performance of candidates seeking a seat as federal deputies.

Therefore, a logistic regression methodology was used, considering two different dependent variables. First, the study explored the socioeconomic and demographic determinants of a candidate's decision to use crowdfunding. Then, we analyzed the effect of using crowdfunding on electoral success. The results suggest that crowdfunding was statistically more used by white and younger candidates, with more years of schooling and running for states in the South of Brazil. The results showed that crowdfunding was an electoral strategy used especially by candidates from newly created, left-wing, center-left, or right-wing parties (candidates from parties at the center and center-right in the political spectrum were less likely to use crowdfunding). Also, candidates from parties with large caucuses

in the Chamber of Deputies and those running in coalitions with more political parties were more likely to use this fundraising strategy.

Regarding electoral success, the empirical strategy suggested that, on average, the probability of electoral success is 5.55 pp higher for candidates who used political crowdfunding. This estimate was obtained by considering several other determinants as control variables. In other words, for the same amount of resources raised in a campaign, if part of these funds were raised via crowdfunding, there is, on average, a higher probability of electoral success. Alternative empirical exercises treating crowdfunding as a quantitative variable (funds raised via crowdfunding) were carried out and showed the robustness of the results obtained in this research.

An increase of 5.55 pp in the chances of electoral success is not negligible. This indicates that crowdfunding is a strategy that goes beyond mere fundraising. It may touch behavioral aspects such as symbolic gains (represents a less traditional campaign, for example), present motivational factors, inspire donors with a sense of belonging (collective campaign), and inspire trust and perception of the quality of the candidate and their proposals (Kusuramani & Zo, 2019).

As for the study's limitations, the variable referring to the parties' political spectrum represents a fragility in this analysis since this item can assume different forms depending on the classification adopted, among the many available in political science. Furthermore, the parties themselves vary in ideology over the years as new electoral cycles occur (Zucco & Power, 2021). However, we believe that the potential effect of this variable is not strong enough to invalidate the causal relationships found between the use of crowdfunding and electoral success.

Another limitation worth pointing out is that we did not use a causal identification strategy of the estimated relations. Thus, the estimates presented cannot be interpreted as causal impacts but as associations. There may be unobserved or omitted variables that are related both to crowdfunding and to electoral success. If this happens, the estimated marginal effects will be biased.

Therefore, future research could propose a causality assessment method to establish more accurate estimated effects. One possibility is to verify the influence of crowdfunding on the number of votes or the proportion of votes received, isolating the effects of Brazilian rules for proportional elections considering an open list, which often ends up electing candidates who did not necessarily receive the greatest number of votes. Furthermore, qualitative research is suggested to assist in the interpretation of empirically verified results.

Likewise, these effects should be studied focusing on local elections, observing the candidates for seats in the municipal legislative branch (city councilors). Gathering data from the 2020 local elections in Brazil, it is possible to obtain findings leading to a more robust conclusion about the effects of crowdfunding on electoral performance in general and local elections.

Finally, Constitutional Amendment 97/2017, which instituted the end of party coalitions in proportional elections (rule already implemented in the 2020 local elections), will have its first application in general elections in 2022. The effects of this type of configuration on the electoral and party system are already known (Carreirão & Nascimento, 2010; P. Silva, Davidian, Freitas & Cazzolato, 2015). Notwithstanding, the combination of this new electoral rule with the fundraising dynamics and whether the effects of crowdfunding on electoral success will be maintained is still unknown.

Recent changes in the financing patterns of electoral campaigns in Brazil have led candidates and political parties to debate forms of replacing the corporate financing model that prevailed until 2015. This article showed that crowdfunding can be beneficial and help to increase the chances of electoral success. The research findings brought practical directions, demonstrating that candidates and parties must adapt their funding strategies in forthcoming political campaigns.

Although little used in the country, political crowdfunding deserves attention as a solution to raise funds from individuals and stimulate voluntary participation. It is an emerging strategy with the potential of being institutionalized as an important part of political campaign financing in Brazil.

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APPENDIX

BOX A   CRITERIA TO CATEGORIZE POLITICAL PARTIES ACCORDING TO IDEOLOGY

Abbreviations in 2010	Abbreviations in 2020	Classification Tarouco and Madeira (2015)	Categorization
PCO	PCO	1.1	Left-wing
PSTU	PSTU	1.2	Left-wing
Psol	Psol	1.4	Left-wing
PCB	PCB	1.5	Left-wing
	UP	Autonomous categorization	Left-wing
PCdoB	PCdoB	2.3	Center-left
PT	PT	2.9	Center-left
PSB	PSB	3	Center-left
PDT	PDT	3.3	Center-left
PV	PV	3.5	Center-left
	Pros	Autonomous categorization	Center-left
	Rede	Autonomous categorization	Center
PPS	Cidadania	4	Center
PMDB	MDB	4.2	Center
PMN	PMN	4.4	Center
PSDB	PSDB	4.6	Center
PT do B	Avante	4.7	Center
PTB	PTB	5	Center
	SD	Autonomous categorization	Center
	PMB	Autonomous categorization	Center
PTC	PTC	5.1	Center-right
PTN	Podemos	5.1	Center-right
PRB	Republicanos	5.1	Center-right
PSC	PSC	5.2	Center-right
PRTB	PRTB	5.3	Center-right
PSDC	DC	5.4	Center-right

Abbreviations in 2010	Abbreviations in 2020	Classification Tarouco and Madeira (2015)	Categorization
PR	PL	5.4	Center-right
	Patriota	Autonomous categorization	Center-right
	PSD	Autonomous categorization	Center-right
PP	PP	6	Right-wing
PSL	PSL	Autonomous categorization	Right-wing
DEM	DEM	6.2	Right-wing
	Novo	Autonomous categorization	Right-wing

Source: Elaborated by the authors.

BOX B   **POLITICAL PARTIES INCORPORATED (THE CLASSIFICATION OF THE INCORPORATED PARTY PREVAILED)**

PHS	Incorporated to Podemos
PRP	Incorporated to Patriota
PPL	Incorporated to PCdoB

Source: Elaborated by the authors.