

Effects of Gender Quotas on Female Representation in Brazil

Karen Priscila Rocha Antunes Santos^a, Thiago Costa Monteiro Caldeira^{a,†}, Silvio da Rosa Paula^b

^aBrazilian Institute of Education, Development and Research (IDP), Brazil • ^bUniversity of Pelotas, Brazil

[†]Corresponding author: thiago.caldeira@idp.edu.br

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ABSTRACT

This article examines the underrepresentation of women in Brazilian politics and assesses the impact of a 30% gender quota, introduced by law in 2010, on the affected positions (City Councilor, State Representative, and Federal Representative). To identify the causal effect of the legislation, the difference-in-differences econometric model is used, covering the period from 2002 to 2022. The results indicate that, although the percentage of female candidates grew significantly after the enactment of the law, with a significant effect of 10.75 percentage points, this increase did not translate into greater electoral success. The share of women elected stayed stable and very low in the immediate period after the law. However, since 2018, with the official electoral body allocating mandatory funding to women's campaigns, there has been an increase in the proportion of women elected (albeit slightly), indicating the importance of financial and institutional support to increase female competitiveness.

1. Introduction

Women's political participation is often considered a reflection of democratic maturity and social inclusion in contemporary political systems. The balanced presence of women in national parliaments is one of the pillars of representative democracy (UN Women, 2025).

In Brazil, the equitable presence of women in politics is still far from becoming a concrete reality. Although there are legal mechanisms, such as gender quotas, the Brazilian political field remains predominantly male. Data from a report produced by the United Nations Program for Women (Inter-Parliamentary Union, 2025), reveal that Brazil occupies one of the last positions in the world in terms of gender political parity. Despite representing, according to the Brazilian Superior Electoral Court (TSE) data, 52.74% of the electorate, women still occupy in 2025 a timid space in political representation positions in Brazil (only 18,1% in parliament), which highlights a mismatch between social presence and institutional presence.

The underrepresentation of women in Brazilian politics reveals not only a historical inequality based on patriarchal structures, but also a contemporary challenge to the consolidation of a truly just democracy. The absence of women in positions of power compromises the plurality of perspectives in public decisions and limits the State's ability to adequately represent the diversity of the population. Given this scenario, the Brazilian legal system began to adopt affirmative action policies, such as the quota system initially provided for by Law No. 9,504 of September 30, 1997, and later reinforced by Law No. 12,034 of September 29, 2009. The latter established the mandatory minimum quota of 30% for women candidates per gender in proportional elections, with penalties for non-compliance. The measure aimed to increase female participation in the electoral process, justified by the need to ensure more equitable political representation between men and women, thereby promoting equal access to elective positions.

Considering that the mandatory quotas apply only to proportional elections, the research problem of this article is to determine whether the legal requirement of filling at least 30% of candidacies by gender has significantly altered the results in Brazilian proportional elections for city councilors, state deputies, and federal deputies.

This question is part of a broader debate, advocated by international organizations such as the United Nations Development Programme (UNDP), which recognizes women's political participation as a central element for the consolidation of democracy and warns that affirmative action, while fundamental, needs to be accompanied by structural measures to produce real change. The UNDP (UN Women, 2025) highlights that affirmative action, such as gender quotas, are important mechanism, but insufficient on its own to overcome the structural barriers that hinder female representation.

The scope of the research covers two elections before and four after the enactment of Law No. 12,034/2009, allowing for the observation of possible structural changes in electoral behavior after the establishment of the minimum 30% quota for candidacies by gender.

The analysis of the effects on proportional representation positions stems from the fact that the Quota Law applies only to these positions (it does not include majority positions). The empirical methodology adopted in this article (Difference-in-Differences) allows for a precise causal analysis of the impact of gender public policy on female representation.

We find that, although the percentage of female candidates grew significantly after the enactment of the law, with a significant effect of 10.75 percentage points, this increase did not immediately translate into greater electoral success. The percentage of women elected remained stable (and very low) in the period immediately following the legal milestone.

This research contributes by analysing two decades of proportional elections, in an empirical study that compares periods before and after the law, and differentiates between positions subject to public policy intervention (treatment group) and positions not affected by it (control group).

This article is organized as follows. In addition to this Introduction, section 2 develops the theoretical framework on women's political participation. Section 3 describes the data, methodology, and econometric strategy employed. Section 4 presents the results and empirical analyses, and section 5 summarizes the conclusions.

2. Theoretical Framework

The political participation of women and their underrepresentation in positions of power have been the subject of increasing attention and studies in the field of social sciences. In Brazil, despite institutional advances, such as the adoption of gender quotas and successive resolutions of the Superior Electoral Court, the rates of female presence in elective positions remain below the international average.

Many studies (Brollo and Troiano, 2016; Hessami and da Fonseca, 2020) demonstrate that the presence of women in political positions is associated with relevant results in public policies such as reduced corruption, greater efficiency in resource allocation, and increased attention to social policies, reinforcing the importance of understanding not only underrepresentation, but also its effects on institutional performance.

This section brings together the main theoretical and empirical debates that underpin the analysis proposed in this study.

2.1. Political Representation and Underrepresentation of Women

Political representation, from the perspective of classical theory (Pitkin, 1967), goes beyond formal presence and involves the effective participation of social groups in policy formulation. In Brazil, the low presence of elected women highlights a democratic deficit and limits the capacity of the political system to reflect social diversity (Miguel, 2021).

Given this, several studies indicate that this underrepresentation is related to cultural, institutional, and economic factors (Araújo, 2009; Smith and Monaghan, 2013; Biroli and Miguel, 2015), in addition to social stigmas that associate politics with a predominantly male space. Data from the Inter-Parliamentary Union (Inter-Parliamentary Union, 2025) reinforce that Brazil occupies a lower position in the average number of women in parliament, which highlights the need for affirmative action policies to mitigate structural barriers and expand the presence of women in positions of power.

2.2. Gender Quotas as an Affirmative Action Policy

Electoral quotas constitute a form of affirmative action to correct historical distortions in women's access to institutional politics (Htun, 2002; Krook and Restrepo Sanín, 2016). In Latin America, experiences such as those in Argentina and Mexico demonstrate more significant results when quotas are accompanied by legal enforcement mechanisms and institutional support (Gray, 2003).

In Brazil, the gender quota was established by Law No. 9,504, of September 30, 1997, and later strengthened by Law No. 12,034, of September 29, 2009, in its article 10, §3, which made it mandatory to fill at least 30% of candidacies by sex (Sacchet, 2008). Although these milestones represent important normative progress, the literature shows that gender quotas face significant limitations in the Brazilian context.

Sacchet (2018), for example, when analyzing electoral data and party practices, demonstrates that the open-list proportional representation system, combined with the absence of institutional incentives and the resistance of parties to promoting competitive female candidacies, compromises the effectiveness of quota policies. His research, based on TSE data, concludes that although legislation has increased the number of female candidates, it has not been sufficient to translate this expansion into higher rates of electoral success. Thus, these studies reinforce the need for complementary actions that ensure real conditions of competitiveness for women in electoral contests.

2.3. Effectiveness and Limitations of Quotas in Brazil

Despite normative progress, several authors question the practical effectiveness of quota policies in Brazil. Studies show that, although the number of female candidates has increased, the proportion of women elected remains low. Part of this phenomenon is attributed to the phenomenon of "fictitious candidacies," used by parties to formally fulfill the quota without real support for women (Mazzo and De Brito, 2023).

In addition, barriers such as the unequal distribution of resources and advertising time continue to limit female competitiveness (Da Silva and Nascimento, 2022). Other authors (Holman and Schneider, 2018; Barnes and Holman, 2020) also emphasize the importance of considering the intersectionalities of gender, race, income, and age.

2.4. Political Economy, Electoral System, and Gender

The institutional design and economic incentives exert a significant influence on the viability of female candidacies. Wylie (2018) demonstrates that more personalistic electoral systems, such as the Brazilian one, tend to harm the representation of women. According to the author, this occurs because personalistic systems depend heavily on individual visibility, personal networks, and the self-financing capacity of candidates, characteristics that frequently disadvantage women in contexts of structural inequality.

Political parties with low institutionalization also tend to treat female candidacies as symbolic, allocating fewer resources, advertising time, and effective political support to women (Wylie, 2018). This dynamic is reinforced by the open-list system adopted in Brazil, in which candidates from the same party compete with each other, encouraging individualistic and clientelistic practices, which end up marginalizing female candidacies, especially those without accumulated political capital or consolidated networks of influence.

Piscopo et al. (2022) highlight that asymmetry in campaign financing is one of the main obstacles to gender equality in electoral contests. Women face greater difficulties in accessing resources due to historical exclusion from political and economic power networks and party favoritism towards male candidates considered more “viable.”

Similarly, Erlich and Beauvais (2023) show that the lack of party governance and the prevalence of informal practices disproportionately affect women, who have less access to clientelist and informal support networks. Under these conditions, parties become less welcoming environments for gender equality, perpetuating exclusionary patterns.

2.5. Empirical Methodologies for Evaluating Quotas in Politics

Few studies have been dedicated to empirically evaluating the effects of gender quotas on female political representation. Jones (1998) analyzed the statistical effect, using a fixed-effects regression model, of imposing gender quotas in regional elections in Argentina, concluding that there was a 9.7 percentage point impact on increasing the proportion of women in the total number of elected officials, even though the party list system could significantly alter the result.

Htun (2002), in a comparative study (simple description of the data) between Latin American countries, demonstrated that the impact of quotas is conditioned by the institutional configuration and the degree of oversight; therefore, mandatory and monitored quotas tend to produce more significant effects. Krook (2007), in turn, when analyzing more than 100 countries, identified that the success of quotas is related to the legal design, effective oversight, and the political-cultural context in which they are implemented. In an econometric analysis of the use of quotas in 27 countries, Schwindt-Bayer (2009) identified that even the imposition of participation quotas with weak enforcement mechanisms leads to a significant effect on female representation in elective offices, with great variation between countries, however.

Sacchet (2018) combined qualitative and quantitative analysis (correlation analysis) from TSE data and concluded that the effectiveness of the quota policy in Brazil is limited by the characteristics of the open list system and the absence of real party incentives, which contributes to the underutilization of the rule and the recurrent use of fictitious candidacies.

Bagues and Campa (2021), using a regression discontinuity design, provide a comprehensive analysis of the short- and medium-term effects of gender quotas in candidate lists, using evidence from local elections in Spain. As a result, they find an increase in the share of women among council members of only 4 p.p.

Except for the last one, these studies did not employ econometric models capable of estimating the causal effects of quota policies on election results. In this sense, this article employs the Difference-in-Differences (Diff-in-Diff) model, a traditional causality assessment strategy, to address this gap, making an original contribution to the literature on evaluating of affirmative action policies in electoral politics.

2.6. Brazilian Legal Framework and Gender Quotas

Women’s political participation in Brazil has historically been limited by institutional, cultural, and economic barriers. In response, the Brazilian legal system has incorporated norms aimed at promoting gender equality in candidacies, especially through quota legislation. Thus, it becomes relevant to describe the normative path of this policy, with emphasis on the laws that underpin this study: Law No. 9,504/1997 and its mini-reform brought about by Law No. 12,034/2009, specifically in article 10, §3.

Law No. 9,504, of September 30, 1997, known as the Elections Law, regulates various aspects of the Brazilian electoral process. The innovative landmark of this norm was the introduction of the gender quota for proportional candidacies. Article 10, §3, established that political parties should reserve a minimum of 30% and a maximum of 70% of candidacies for each sex (not necessarily 30% for women). However, the original wording only provided for the reservation of positions, not their mandatory occupation, which allowed for practical non-compliance with the rule without significant penalties.

Subsequently, with the aim of increasing the effectiveness of the quota policy, Law No. 12,034, enacted in 2009, which came into force on the date of its publication, amended the wording of paragraph 3 of article 10 of the Elections Law. The new wording stipulated, starting in the 2010 election, that parties should effectively fill a minimum of 30% of candidacies with people of each sex, replacing the expression “reserve” with “fill”. This change elevated the gender quota from a programmatic provision to a binding legal requirement, subject to oversight by the Electoral Court.

This modification was considered a milestone in addressing female underrepresentation, as it formally prevented the registration of slates that did not respect the minimum proportion of female candidates. From that moment on, the TSE and the TREs should start rejecting registrations of collective candidacies that do not comply with the rule. It is important to highlight that this requirement applies exclusively to proportional elections (Federal Deputies, State Deputies, and City Councilors), not covering majoritarian positions (President, Governor, Senator, and Mayor), which are not subject to the gender quota in the candidacy registration phase.

Despite the legal progress, the material fulfillment of the quota still faces real challenges, with attempts to circumvent the rule. The main one is the practice of so-called “dummy candidates,” in which women are registered only to formally fill the 30% quota, without the intention and real ability to compete or without effective party support. This practice has been the subject of complaints and lawsuits, being considered electoral fraud in several recent judgments. One example was the decision of April 3, 2023, when the TSE annulled the election of PRTB councilors in Belo Horizonte/MG, as it

constituted quota fraud through fictitious candidacies, with women without registered campaigns, votes, or electoral expenses (TSE, [Tribunal Superior Eleitoral, 2023](#)). Another 81 cases of gender quota fraud were declared by the TSE in the years 2023 and 2024 (TSE, [Tribunal Superior Eleitoral, 2024](#)).

This shows that the Electoral Court has begun to concretely punish the practice, annulling votes, recalculating quotients, and applying sanctions such as the revocation of diplomas and ineligibility. In February 2022, the TSE (Superior Electoral Court) issued Resolution No. 23,664/2021, which defined clear guidelines for the management of the Electoral Fund in the 2022 elections, establishing that at least 30% of the resources allocated to each party's campaigns must benefit female, Black, and Indigenous candidates, proportionally to the composition of candidate registrations (TSE, [Tribunal Superior Eleitoral, 2021](#)). In February 2024, the TSE approved a specific resolution ([Tribunal Superior Eleitoral \(TSE\), 2024](#)), including gender quota fraud among the typified electoral offenses, and extending instructions to the Electoral Zones to curb such fraud in municipal elections. These advances indicate a more proactive and effective performance by the Electoral Judiciary.

In the judicial sphere, the judiciary has been applying the new Constitutional Amendment No. 117/2022, disapproving accounts of party directorates that did not transfer the resources from the gender quota, ordering the return to the public treasury and the temporary suspension of the receipt of public funds.

These advances show that the Electoral Court has been institutionalizing mechanisms to protect equal electoral conditions, pressuring parties to comply with the minimum legal percentages and strengthening the balance of power.

3. Methodology

3.1. Database

The research uses electoral data from official sources, especially the Superior Electoral Court (TSE), covering the Brazilian proportional elections of 2002, 2006, 2010, 2014, 2018, and 2022, for State and Federal Deputies, and 2004, 2008, 2012, 2016, 2020 for City Councilors. This data follows the natural logic of the Brazilian electoral process, structured in biennial electoral cycles, alternating between general and municipal elections every two years, which allows the construction of a consistent time series throughout the analyzed period. With variables that include: candidate's gender, position sought, percentage of votes obtained, campaign financing, political party, federative unit (UF), coalition, etc.

It is important to point out that Law No. 12,034/2009 was applied in the 2010 election, because, according to Article 16 of the Federal Constitution, changes in electoral legislation can only take effect if approved at least one (1) year before the election (principle of prior electoral law). As the law was enacted on September 29, 2009, and the elections took place in October 2010, the time requirement was respected. Furthermore, Article 6 of the aforementioned law determined its immediate validity on the date of its publication.

The process of compiling the database for City Councilors, State Representatives, and Federal Representatives was carried out in this study, rigorously respecting the defined methodological criteria, ensuring the reliability, reproduction, and standardization of the information. The strategy adopted prioritizes the traceability of sources and alignment with the research objectives, guaranteeing the consistency of the data presented.

The data used in this study were obtained from the Superior Electoral Court (TSE) and other official sources, through the following databases:

- **DivulgaCandContas/TSE:** financial information on electoral campaigns;
- **TSE Public Repositories:** historical series organized by election, position, and federative unit, official data on candidate registration and vote counting;
- **Instituto Brasileiro de Geografia e Estatística (IBGE):** socioeconomic indicators used for contextualization by state;
- **Portal da Legislação Federal:** consultation of electoral legislation and construction of the legal framework used in the study.

The sample covers proportional elections held before and after the Quota Law No. 12,034/2009, distributed as follows:

- **City Councilors' data:**
 - Before the Law: years 2004 and 2008.
 - After the Law: years 2012, 2016, and 2020.
- **State and Federal Deputies:**
 - Before the Law: years 2002 and 2006.
 - After the Law: years 2010, 2014, 2018, and 2022.

Thus, elections prior to the Law are considered to be those held up to 2008 for city councilors and up to 2006 for deputies. The elections following the Law are those from 2010 onwards for deputies and from 2012 onwards for councilors, respecting the constitutional requirement.

Thus, the year 2010 constitutes the cutoff point for the application of the Difference-in-Differences (DiD) technique, allowing the comparison of biennial electoral cycles before and after the mandatory implementation of gender quotas.

The frequency of the data follows the Brazilian electoral calendar, which is organized into electoral cycles, alternating general and municipal elections every two years. The information for each position changes at regular intervals of four years. In this sense, in the first year of each municipality's term, there is information on the percentage of women elected to the City Council, which remains the same for 4 years. Table 1 below shows the variables used in the study.

Table 1. Description of the variables used in the study.

Variable	Definition	Unit of Measurement
Sex	Candidate's gender	Dummy (1 = Female, 0 = Male)
Position	Position being contested	Nominal categorical title (City Councilor(s), State Representative, Federal Representative, Governor, Senator, President, and Mayor)
Proportional Position	Determines if the position is proportionate.	Dummy (1 = proportional; 0 = majority)
Elected	Election results	Dummy (1 = elected, 0 = not elected)
Percentage of votes	Proportion of valid votes received	Percentage (%)
Election year	Election year	Numerical (2002, 2004, 2006, 2008, 2010, 2014, 2018, 2022)
Political party	Party acronym	Nominal categorical
State	Federal Unit	Nominal categorical
Post-Law	Period subsequent to Law No. 12.034/2009	Dummy (1 = year $\geq$ 2010, 0 = year < 2010)

Source: Prepared by the author using data from the Database (BigQuery / TSE).

The basis used in this study is an unbalanced panel, composed of individual observations of candidacies in each election (repeated cross-section) monitored over different electoral cycles (discrete time series). This configuration allows the application of the Difference-in-Differences (Diff-in-Diff) model, suitable for identifying the causal effect of Law No. 12,034/2009.

The data were extracted from the Base dos Dados (Base dos Dados, 2025) platform, specifically from the *br_tse_eleicoes* dataset, available on Google BigQuery. This database gathers official records of candidacies declared to the Superior Electoral Court (TSE) since 1998, enabling the construction of a consistent and standardized database for longitudinal analyses.

Based on the structured database, a descriptive analysis of female participation in municipal elections between 2004 and 2020 is presented. The data show a significant evolution in the proportion of female candidates, especially after the enactment of Law No. 12,034/2009. However, the increase in the proportion of women elected was less pronounced for female councilors.

Table 2 below shows that the proportion of female candidates practically doubled between 2008 and 2012, the first electoral cycle after the implementation of Law No. 12,034/2009. This trend continued in subsequent years, with steady growth until 2020. However, although there was also an increase in the number of women elected, the gains in the percentage of women elected were modest, indicating a possible barrier to converting candidacies into mandates.

Table 2. Proportion of Women Candidates and Elected in Municipal Elections for City Council Member(s) (2004–2020).

Year	Women Candidates (%)	Women Elected (%)	Difference After the Law (pp.)
2004	12.4	5.2	–
2008	13.1	5.7	0.2
2012	28.9	9.3	3.9
2016	31.0	10.1	4.6
2020	33.4	11.2	5.7

Source: Data extracted from the candidates table (Database / BigQuery).

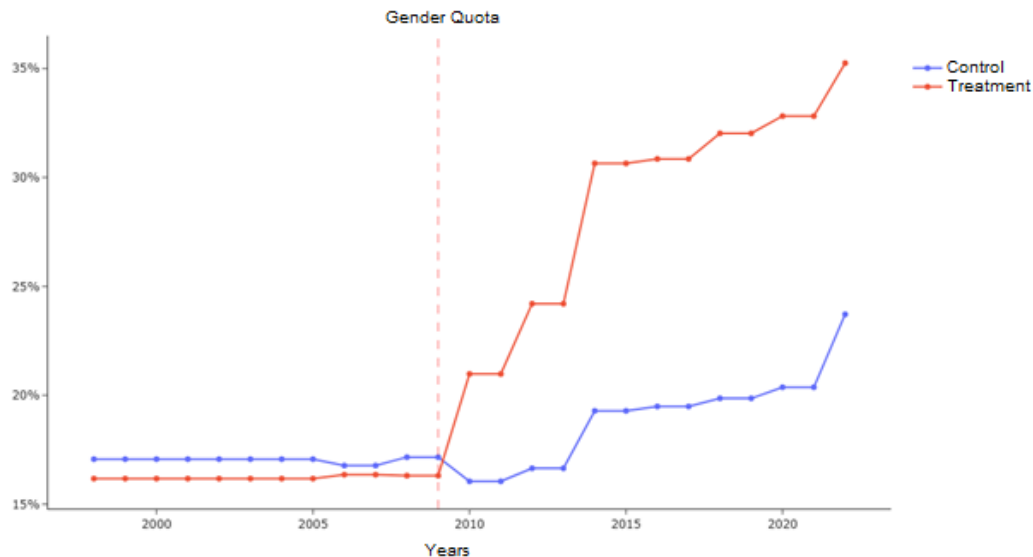
Table 3 below shows the evolution of female participation in proportional elections for the positions of State Representative and Federal Representative in Brazil, from 2002 to 2022. The data refers to the proportion of women among the total number of candidacies and mandates actually won in each election.

Table 3. Proportion of Women Candidates and Elected in Elections for State and Federal Representative (2002–2022).

Year	Candidates State (%)	Elected State (%)	Candidates Federal (%)	Elected Federal (%)
2002	13.8	10.2	13.1	5.7
2006	14.1	11.1	13.3	8.4
2010	24.7	11.6	21.6	8.6
2014	29.6	12.2	28.0	9.3
2018	32.2	15.0	31.5	15.0
2022	33.7	19.2	33.4	17.7

Source: Prepared by the author using data from the Database (BigQuery / TSE).

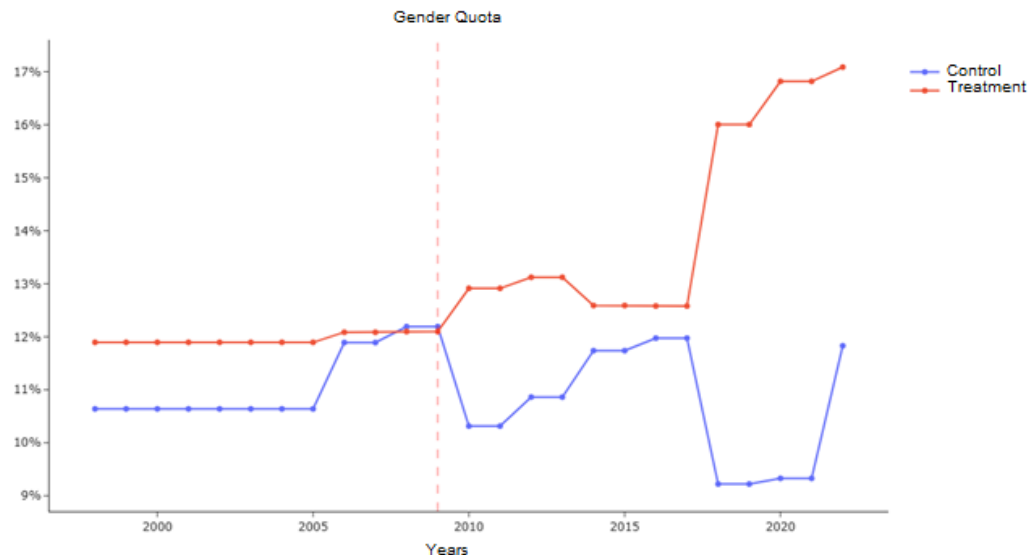
The following figure shows the evolution in the proportion of women in the total number of candidates, for all proportional positions (treatment group) and all majority positions (control group).

Figure 1. Evolution of the Proportion of Female Candidates.

Note: In the control group, the average percentage of women candidates for majoritarian positions (mayor, senator, governor, president) is considered. In the treatment group, the percentage of women candidates in elections for proportional positions (city councilor, state and federal representative) is considered. The information is updated every two years, considering that elections are held for at least one of the positions in both the treatment and control groups every two years. *Source:* Prepared by the author using data from the Database (BigQuery / TSE).

The curve shows stagnation until 2009, and strong growth in proportional representation positions from 2010 onwards, with the first election under the law, reaching the minimum percentage imposed by the law from 2014 onwards.

Figure 2 below shows the evolution in the percentage of women elected (total number of women elected divided by the total number of available positions), for all proportional positions (treatment group) and all majoritarian positions (control group).

Figure 2. Evolution of the Percentage of Women Elected.

Note: In the control group, the average percentage of women elected to majoritarian positions (mayor, senator, governor, president) is considered. In the treatment group, the percentage of women elected in elections for proportional positions (city councilor, state and federal representative) is considered. The information is updated every two years, considering that elections are held for at least one of the positions in both the treatment and control groups every two years. *Source:* Prepared by the author using data from the Database (BigQuery / TSE).

As shown, it was only in 2018 that we observed a turning point, that is, a more pronounced change in the growth rate. This indicates that female candidacies gained momentum with the TSE resolutions, as presented below.

3.2. Methodological Strategy

This research employs the difference-in-differences (Diff-in-Diff) method as the main econometric approach. This model is widely used for causal inference in contexts where there is an intervention (in this case, the implementation of Law No. 12.034/2009) and the aim is to compare the performance between a treatment group (in this study, proportional

positions subject to gender quotas) and a control group (majority positions that were not affected by the gender quota) over time.

Difference-in-differences econometric specification allows isolating the effect of legislative change by controlling for temporal trends common to both groups and observable individual characteristics. In this way, the model enables a robust assessment of the impact of mandatory gender quotas on women's electoral viability in Brazilian proportional elections.

Furthermore, the difference-in-differences model, applied through Ordinary Least Squares (OLS) linear regression, allows for the control of unobservable fixed effects that could simultaneously influence both groups over time, reducing estimation bias and increasing the robustness of the results. The empirical literature in social and economic sciences recognizes the difference-in-differences model as one of the most popular approaches for causal inference in public policy evaluations, reinforcing its suitability for the objectives of this study (Roth et al., 2023).

The difference-in-differences econometric model can be represented in a simplified, didactic, and conceptual way by the following formal equation:

$$Y_{it} = \alpha + \beta_1 \text{Proportional}_i + \beta_2 \text{PostLaw}_t + \beta_3 (\text{Proportional}_i \times \text{PostLaw}_t) + \gamma' X_{it} + \varepsilon_{it} \quad (1)$$

Where:

- Y_{it} : two dependent variables are analyzed: (1) percentage of women elected in the federative unit i (Municipality or State) at time t ; (2) percentage of candidates who are women in the federative unit i (Municipality or State) at time t ;
- α : is the intercept of the regression;
- β_1 : captures average differences between proportional and majority positions before the law, and the variable "Proportional" is a dummy variable that takes the value 1 for proportional positions (city councilor, state and federal representative) and 0 for majority positions (mayor, governor, senator, president);
- β_2 : captures general trends over time that affect all positions, and the variable "Post-Law" is a dummy variable that takes the value 1 for elections held after the enactment of Law No. 12,034/2009 (2010 onwards for deputies and 2012 onwards for councilors);
- β_3 : the coefficient of interest for this article, which measures the causal effect of Law 12.034/2009 on the treatment group (proportional positions), corresponds to the Difference-in-Differences estimator;
- $\gamma' X_{it}$: is the vector of control variables (the covariates): the proportion of women in the population and indicators of the Municipal Human Development Index (life expectancy at birth; education; per capita income);
- ε_{it} : is the random error term (difference not explained by the model).

The parameter β_3 constitutes the main variable of interest in the research, as it indicates whether there was — and to what extent — an impact on the electoral performance of women in proportional representation positions, compared to their performance in majority representation positions, after the aforementioned Law came into effect.

However, this formulation corresponds to the basic Differences-in-Differences model. The final empirical model used in this work adopts the more robust structure proposed by Callaway and Sant'Anna (2021), appropriate for contexts with multiple post-treatment periods and different adoption cutoffs. This approach allows for the estimation of specific effects over time, respecting the dynamics of biennial electoral cycles and the differences between positions and federative units.

In other words, this article uses a more advanced version of the Differences-in-Differences method, which allows for the analysis of the impact of a public policy over time and among different groups. The methodology, developed by Callaway and Sant'Anna (2021), is particularly suitable when the policy (in this case, Law No. 12,034/2009) affects at different times.

The Control Variables (X_{it}) used in this article, which include observable characteristics of the candidates that may influence their electoral performance, are as follows:

- Proportion of women in the population;
- Indicators of the Municipal Human Development Index (MHDI): life expectancy at birth; education; per capita income.

These variables control for observable characteristics of the region that can influence electoral performance, reducing potential estimation biases. Previous studies (Ferreira & González, 2014; Samuel, 2001) demonstrate that factors such as age, party affiliation, campaign resources, and geographic location have a significant impact on electoral competitiveness.

The inclusion of the control vector (X_{it}) ensures that the effect attributed to Law No. 12,034/2009 is not confused with structural determinants of electoral success.

4. Results

Table 4 summarizes the estimated effects of Law No. 12,034/2009 on the percentage of female candidates and the percentage of women elected.

Table 4. Estimated Impact.

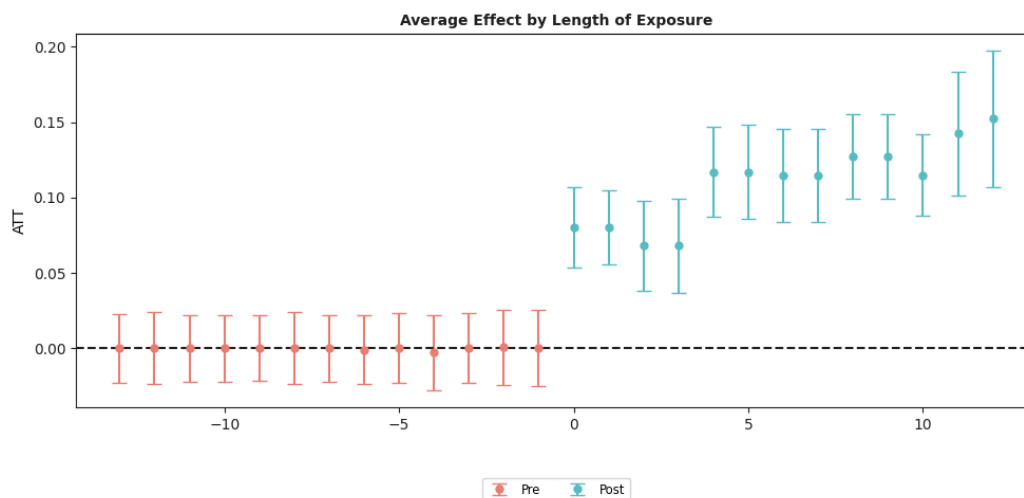
Models	(1) Candidates	(2) Candidates	(3) Elected	(4) Elected
ATT (DiD)	0.107*** (0.008)	0.107*** (0.009)	0.032 (0.019)	0.031 (0.018)
Effect (pp)	10.75 pp	10.75 pp	3.16 pp	3.08 pp
Covariates	No	Yes	No	Yes

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Values in parentheses are robust standard errors. The “Effect (pp.)” line reports ATT in percentage points ($ATT \times 100$), since the dependent variable is at the level (ratio 0–1). All models include fixed effects of state and year. Covariates = proportion of women in the population and indicators of the Municipal Human Development Index. DiD using the Callaway & Sant’Anna method. Source: Prepared by the author using data from the Database (BigQuery / TSE).

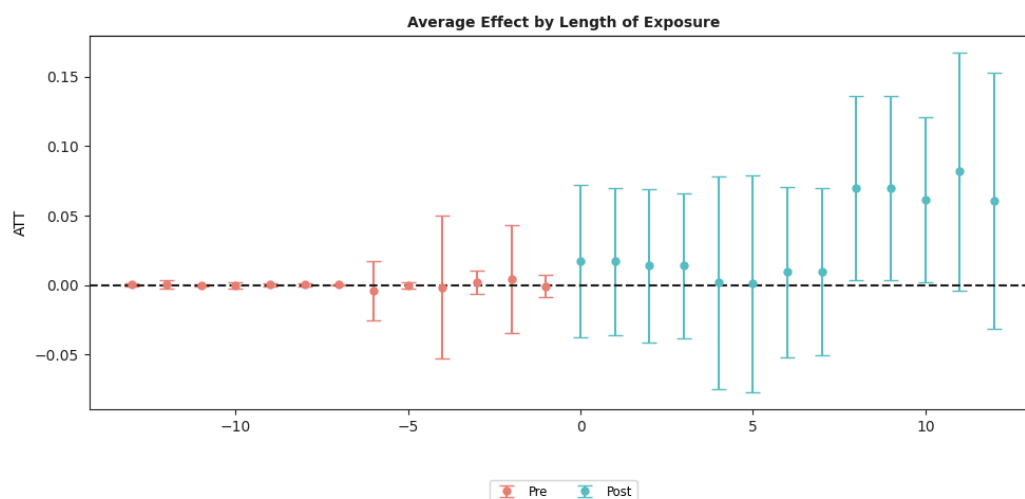
The table above presents the results of the Difference-in-Differences estimation using the csdid method, proposed by Callaway and Sant’Anna (2021). The average impact of Law No. 12,034/2009 on the proportion of female candidates is positive and statistically significant in both models, with and without covariates, reaching an increase of 10.75 percentage points. The jump seen in the crude statistics (Tables 2 and 3) is therefore confirmed in the causal effect of the difference-in-differences method.

The impact on the proportion of women elected shows positive estimates, but not statistically significant, with estimated effects between 3.08 pp and 3.16 pp. Thus, the small advance is not robust, suggesting that the law changed the supply, but did not guarantee greater electoral success.

Figures 3 and 4 below present the event study, common in difference-in-differences models, which indicates the existence of a dynamic effect, with the analysis of the effect on the proportion of women candidates (Figure 3) and women elected (Figure 4). The dynamic effect explores the temporal variation in the onset of treatment (*treatment timing variation*), comparing the effects of Law No. 12,034/2009 between groups with different exposure times, such as the positions of city councilor (treated in 2010) and state representative (treated in 2012). This approach allows identifying whether the effects are generalizable and consistent over time and between different treated groups, in addition to mitigating risks of bias due to coincidental events (Callaway and Sant’Anna, 2021).

Figure 3. Dynamic Effect (Event Study) on the Proportion of Female Candidates.

Source: Prepared by the author.

Figure 4. Dynamic Effect (Event Study) on the Proportion of Elected Female Candidates.

Source: Prepared by the author.

Even though the increase in elected women wasn't significant, the graph shows relevant growth starting in 2018. This finding coincides with the practical application of rules for allocating campaign funds. This indicates that incentive policies began to take effect, promoting more female candidacies with real chances of competing. One possible explanation for the jump in 2018 is the issuance of TSE resolutions (No. 23,553/2017 and No. 23,575/2018), which guaranteed mandatory financial resources for female candidates (TSE, *Tribunal Superior Eleitoral*, 2018). That year was the first time the 30% quota had a "financial backing", that is, it ceased to be just a rule on paper and began to offer real support to women in politics.

4.1. Treatment Cutoff Analysis

To assess the consistency of the results, Table 5 presents the results of the estimated effect of Law No. 12,034/2009 on female participation in elections, with two distinct treatment cohorts: the first, composed of candidates for city councilor (2010 cohort), and the second, of candidates for state representative (2012 cohort). This approach allows for the identification of possible differentiated effects of the legislation, depending on the level of the electoral contest (municipal or state/federal) and, as demonstrated in Table 5, the previous findings are confirmed: there is a statistically significant positive effect on the percentage of female candidates (stronger for municipal city councilor elections), but a statistically null effect on the percentage of women elected.

Table 5. Estimated Effect of Law No. 12,034/2009 on Female Participation by treatment cohort (2010 = City Councilors, 2012 = State Representatives).

	Overall	2010 (City Councilors)	2012 (Deputies)
Candidates – No covariates	0.106*** (0.009)	0.121*** (0.011)	0.074*** (0.011)
Effect (pp)	10.58 pp	12.12 pp	7.39 pp
Candidates – With covariates	0.106*** (0.007)	0.122*** (0.01)	0.073*** (0.011)
Effect (pp)	10.57 pp	12.16 pp	7.28 pp
Elected – No covariates	0.03 (0.018)	0.041 (0.029)	0.009 (0.025)
Effect (pp)	3.05 pp	4.09 pp	0.88 pp
Elected – With covariates	0.03 (0.019)	0.039 (0.026)	0.01 (0.025)
Effect (pp)	2.97 pp	3.94 pp	0.97 pp

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Values in parentheses are standard errors robust to heteroscedasticity. Since the dependent variable is at level (0–1 ratio), we report: (i) Effect (pp.) = $100 \times \text{ATT}$ and (ii) Increase (%) vs. pre-average = $\text{ATT} / \text{pre-law average} \times 100$. Source: Prepared by the author using data from the Database (BigQuery / TSE).

5. Interpretation of Results and Conclusions

When comparing the findings obtained in this study with the literature, it is observed that they partially confirm what has been identified in previous research on the effectiveness of gender quotas. As Brollo and Troiano (2016) point out, the creation of Law No. 12,034/2009 had a positive impact on increasing the proportion of female candidates, especially in municipal elections.

On the other hand, as [Sacchet \(2012\)](#) points out, this growth in candidacies has not yet translated significantly into a greater number of women elected. These authors emphasize that, even with more women running, important inequalities persist — such as unequal access to party resources, advertising time, and political visibility — which continue to limit women's electoral success.

Based on the estimates obtained, the article indicated a positive and statistically significant impact of Law No. 12,034/2009 on the proportion of female candidates, with robust effects in both models with and without covariates. The estimated magnitude — approximately 10.75 percentage points — indicates a significant increase in female representation in candidacies after the implementation of the law.

On the other hand, the effects on the proportion of women elected, although positive (between 3.08 and 3.16 percentage points), were not statistically significant, suggesting that the increase in the number of female candidates did not automatically translate into greater representation in elected positions.

These findings indicate that, despite the law's effectiveness in increasing female participation in the candidacy process, significant barriers to the effective election of women persist—possibly related to factors such as unequal allocation of campaign resources, media visibility, or party structures.

From 2018 onwards, a more visible increase can be observed, coinciding with the entry into force of the TSE resolutions that guaranteed specific funding for female candidates.

These results confirm findings from the literature, such as those of [Brollo and Troiano \(2016\)](#), regarding the role of quotas in increasing female representation in candidacies, especially when combined with an institutional context that favors their implementation.

The results obtained reveal that Law No. 12,034/2009 was effective in increasing the proportion of female candidates, producing significant growth immediately after its implementation. However, this increase did not translate proportionally into greater electoral success. The rate of women elected remained modest, indicating that the expansion of female candidacies, by itself, was not sufficient to reduce the historical underrepresentation of women in positions of political power.

Another relevant aspect concerns the normative limitation of the law, which applies exclusively to proportional elections, not reaching the majoritarian positions (President, Governor, Mayor, and Senator). This exclusion contributes to maintaining inequality in the occupation of positions with greater decision-making power. The absence of rules aimed at parity in majoritarian slates may be restricting the possibilities of women's ascension to the highest positions in national politics.

It is concluded that Law No. 12,034/2009 constituted a relevant normative milestone, but its effects were limited when not accompanied by institutional support instruments. The most significant advances occurred only when legal norms began to be associated with mandatory financial resources, which demonstrates that formal equality, although necessary, is insufficient to overcome structural gender asymmetries in Brazilian politics.

Finally, the literature review indicates that, to date, there have been no studies that applied a robust causal inference model to the analysis of gender quota policies in elections in Brazil. Thus, this work contributes methodologically to the national literature by introducing a more rigorous empirical approach, offering new evidence on the effectiveness of quota policies and pointing the way for future research and necessary democratic reforms.

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