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IS THE CRYSTAL CEILING BREAKING?
EFFECT OF CAMPAIGN SPENDING AND INCUMBENCY ON WOMEN
ELECTORAL RESULTS: THE CASE OF THE CHILEAN CONSTITUTIONAL
CONVENTION.

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Abstract

Campaign spending and the participation of incumbent candidates affect the outcome of an electoral contest, but both the fundraising process and voting itself usually disadvantage female candidates. This disadvantage produces a lack of female representation in political positions, which is part of the so-called "crystal ceiling" also present in other spheres of social structure. The Chilean Constitutional Convention electoral process was a new electoral phenomenon that had no incumbents and forced entrance and exit parity, shattering this crystal ceiling. Estimations of a two-stage least squares model with data from the Chilean electoral college (Servel), show that the effectiveness of campaign spending rises in the absence of incumbency. Also, this result leaves an open door to observe if these rules could eventually change future electoral preferences, lessening the bias against female candidates.

Introduction

Even though female demands for equality and justice have been a constant in society, women continue to be underrepresented in many aspects of the social and economic structure. The underrepresentation of women in elected political office is one of them.

We focus in the Chilean case because, although gender quotas were implemented in parliamentary elections in 2017, the bias against women candidates persists. The so-called "crystal ceiling" in politics resists being broken.

One of the main reasons for this phenomenon is that women collect and spend less resources on their campaigns and that male incumbents have an important leverage during campaigns. These results have been documented for in different countries and political systems (Green 1998) (Green 2003).

The Constitutional Convention electoral process in Chile, which took place in 2021, introduced several new rules to promote gender equality and inclusivity. One significant aspect was the imposition of gender quotas at the district level, both for the entrance and exit of the process. This means that equal percentage of seats were reserved for candidates of each gender.

The electoral process also involved the presentation of gendered interleaved lists, with the requirement that female candidates be placed at the top of the lists. This was done to ensure better representation of women in the convention.

Furthermore, the Constitutional Convention was a unique institution created specifically to write a new constitution for Chile. There was no incumbency because it was a fresh assembly, unlike regular elections where incumbent candidates play a crucial role when seeking for re-election. Once the convention fulfilled its objective of drafting a new constitution, it was dissolved.

With no incumbency effects, this study can isolate the effect of gender on fundraising and electoral performance. Hence, we can use this scenario to study how different the impact of campaign spending is on the percentage of votes male and female candidates obtain.

We use previous Congress election of 2017 as a benchmark because we obtain comparable results. So, when we estimate the effect of campaign spending on share of votes obtained by candidates disaggregating the results by gender, we can focus on how reasonable our results are.

The main reasons to choose the Chamber of Deputies election of 2017 as a reference for making this comparison were, first, that both the Convention and the Congress elect 155 representatives and, second, that the representation followed the same territorial distribution as deputies' districts.

We use data from the National Electoral Service (SERVEL) on campaign expenditure, electoral performance, and personal information of candidates, together with demographic information of districts obtained from the National Institute of Statistics (INE), to apply a Two-Stages-Least-Squares Regression (2SLS) (Johnston and Pattie 2008) (Gamboa and Morales 2021), using the number of registered voters of each district as an instrumental variable.

Furthermore, we add a new feature to the estimation procedure because we use a logistic transformation of variables because both endogenous variables – percentage of votes and campaign expenditure over the campaign limit – can only take values in between zero and one and we need to ensure that the prediction are not out of range.

Results show that, effectively, women do spend a similar amount of funds than men, but the effectiveness of campaign spending in votes share was higher in the convention election than in 2017's congressional election.

The most remarkable difference is that, given the results of the exit parity rule in this election, gender disadvantage not only disappeared but became a disadvantage for male candidates that had to be corrected in favor of men instead of women. In fact, seven male candidates replaced women who obtained more votes while only five female candidates replaced men who obtained more votes because of this rule.

The methodological use of logistic transformation of variables together with the use of this non-incumbency event to find interesting results are the main contribution of this research.

Theoretical Framework

Since the Federal Electoral Campaign Act started collecting information about campaign expenditure, scholars suggested three main results: the relationship between campaign spending and electoral results is endogenous, the relationship is nonlinear and incumbents' expenditure is less effective casting votes than challengers' expenditure (Jacobson, 1978). It was followed by a rich discussion about the correct method to obtain unbiased results either by choosing the right instrumental variable or the right econometric approach (Green & Krasno, 1988) (Welch, 1981) (Erikson & Palfrey, 1998) (Levitt, 1994) (Benoit K. a., 2003). Jacobson himself summarizes various analyses and methods used over the last four decades on how money affects the number of votes that a candidate obtains in different countries and democratic organizations, considering the demographic and personal characteristics of candidates as well as the political regime of every nation (Jacobson 2015).

Gender is a remarkable characteristic of candidates which impact transcends cultural and political issues. Data from several studies has shown similar results about the effect of campaign spending on electoral results for women: the number of elected women is evidently lower than the number of elected men. Indeed, the origin of this disadvantage seems to be deep. Female candidates face a bigger challenge than their male counterparts when it comes to fundraising. They need to exert more effort than men because they rely on more sources that provide less

individual contributions (Jenkins 2007)(Sorensen and Chen 2022). This difficulty in fundraising makes women less reluctant to run competitive campaigns.

Additionally, women are often expected to conform to gender stereotypes when campaigning, which can make it harder for them to be taken seriously as candidates. Women considering political careers face additional challenges related to marriage and childcare. Married women who have children may feel that they cannot devote the necessary time and energy to a political career due to the demands of their family responsibilities. This can be especially true for women who do not have a partner who is able to provide support and take on a larger share of domestic responsibilities. (Fox, Lawless and Feeley 2001)

These stereotypes manifest in several ways, such as the perception that women are not as competent as men or that they are not as capable of handling certain issues. Gender stereotypes are widely held beliefs about the characteristics and behaviors that are considered appropriate for men and women (Sanbonmatsu and Dolan 2009). These beliefs can influence the way voters perceive and evaluate male and female candidates and can impact the success of women in elections. Research has shown that voters are more likely to support male candidates over female candidates, even when female candidates are equally qualified (Sanbonmatsu 2002) (McDermont 1997) (Besley, et al. 2017).

This situation is particularly clear in governor's races because women are more likely to financially support women candidates in congressional races, but they

are not as likely to support women running for the governor's chair. This may be due to a variety of factors, including the fact that governor's races are typically seen as more prestigious and high-profile than other political campaigns, and women may feel less confident in the ability of a woman to win in this context. (Gothreau and Sanbonmatsu 2021)

Furthermore, gender gap begins in the primary process within parties (Sanbonmatsu and Rogers 2020) (Herrick 1996) (Jenkins 2007). The main problem seems to be that it's hard for women to raise money from the parties to face campaign spending. At this stage of the process, many women desist from being candidates because of the lack of monetary support in the first place.

The assumption that the more money collected, the more votes one can get, is a strong reason to be discouraged. In fact, this nonneutral complexity of finding financial supporters in primary candidatures determines nonneutral electoral spending in the final careers of female candidates (Herrick 1996).

Moreover, political parties play a crucial role in breaking the cycle of underrepresentation and can help increase the number of women and other marginalized groups in public office. This is because political parties are often responsible for nominating and supporting candidates and can therefore play a key role in promoting diversity and inclusion within their ranks. By nominating more women and other underrepresented groups as candidates, political parties

could create a more inclusive and representative political landscape. (Fraga and Hassell 2021)

Along the same lines, when analyzing successive elections for the US House of Representatives, one important factor for women's success as candidates is political party membership, as parties that are perceived as more supportive of women's rights and gender equality may be more likely to nominate and support female candidates. This element is as crucial as candidate occupational background to obtain similar outcomes for women and men with similar amounts of campaign expenditure. In other words, it is not only necessary for women to obtain the same financial support as men to get enough votes, but they also need to be publicly related to a traditional political party. (Green 2003) (Green 1998)

Additionally, incumbency is often a significant factor in electoral outcomes since incumbent candidates have an advantage over non-incumbent candidates. This can be especially relevant when examining the electoral success of male and female candidates, as men are more likely to be incumbents than women. (Gamboa and Morales 2021)

All these disadvantages in the political arena are part of the so-called "crystal ceiling" that women must face in many aspects of social life. Discrimination against women and minorities forces these groups to duplicate efforts to win a place in decision-makers' spheres.

Therefore, there is no surprise when realizing that women running for political seats are better qualified and professionally better prepared to face the commitments of the positions that they are running for than their male counterparts. The surprise is that, in equal conditions, these over prepared women are still being dismissed by voters to hold public offices even in "women friendly" districts. So, it seems there is not gender neutrality in electoral outcomes. (Pearson and McGhee 2013)

The lack of support from voters for female candidates contradicts the popular perception of democratic legitimacy that women's presence gives to any political decision taken by Congress, particularly those that may affect women's rights and social well-being. (Clayton, O'Brien and Piscopo 2019)

In this way, gender quotas create a more levelled playing field and increase the overall quality of politicians, regardless of their gender. In fact, contrary to what quota opponents argue, there is no threat to meritocratic selection. (Chen 2010) (Lucardi and Micozzi 2022) (Gamboa and Morales 2021)

The introduction of gender quotas in the Swedish political system, for example, increased the competence of male politicians and improved competitiveness in subsequent election periods. This is because all the auto-excluded women that were competitive before the gender quota used the space that mediocre male candidates left (Besley, et al. 2017).

Moreover, some studies suggest that the participation of more women in previous political races could increase the participation of female candidates in future electoral processes, even when the rate of women elected remains below the rate of men elected. (Gilardi 2015) (Bhalotra, Clots-Figueras and Iyer 2018)

In Chile, women candidates, particularly challengers, face significant barriers in terms of access to resources for campaigning, including financial resources, media coverage, and support from political parties. This make it more difficult for women to be competitive in elections, particularly when compared to male candidates who have more established networks and access to resources. (Piscopo, Hinojosa, et al. 2022) (Gamboa and Morales 2021)

In fact, gender inequality was among the reasons for the riots that preceded the political agreement of writing a new Constitution and electing an *ad-hoc* Convention (Suarez-Cao, 2021) (Piscopo & Siavelis, 2021). The proposed institution that had the responsibility of writing a new Constitution mimicked the Chamber of Deputies: 155 representatives chosen from 28 districts. This Constitutional Convention was a total new experience, not only for the mission it was assigned but also for the electoral process that involved it. Notably, the absence of incumbency in this novel electoral experience raises intriguing implications, hinting at the potential elimination of the female underrepresentation traditionally associated with incumbency.

The second point of interest in this case is that there was not only an entrance gender quota, but there was also a mandatory exit gender parity. In other words, it was established that there should be the same number of female and male representatives in this Constitutional Convention.

Besides this new rule, a territorial adjustment was added by implementing the quota at the district level instead of the national level, as it usually was in previous elections.

Finally, the ballot paper was organized using the *zipper* style, which consists of positioning a female candidate in the first place of every candidate list and following an interleaved gender order within the next candidates.

An empirical analysis of all these theoretical approaches may clarify if all these new conditions change the expected outcome of electoral races for women or, in the new scenario, women candidates' performance remains the same.

Data and Model Specification

We assume that the number of votes cast by each candidate depends on two sets of characteristics. First, it depends on personnel characteristics such as age, gender, campaign expenditure, and political experience, and second, on some the characteristics of the district, such as average income and rurality. (Sorensen and Chen 2022)

We acquired a comprehensive dataset containing the personal information of every candidate who participated in the Constitutional Convention elections from SERVEL. These specifics were: gender, age, incumbency, declared expenditure, traditional party affiliation, party independence or new parties' affiliation, and local and political background at the district or national level.

The emergence of new political parties such as the Republican Party, the *Frente Amplio* (Broad Front Line) list, *El Partido de la Gente* (The Party of the People), and many independent candidates was the logical answer to social demands for institutional changes since traditional parties lead to the political unrest. (Piscopo and Siavelis 2021)

In addition, we included the same detailed data on candidates who ran for seats in both the 2017 and 2021 parliamentary races in order to make a comparison of campaign spending effects on the electoral results of male and female candidates.

For the same three electoral events, we obtained valuable district-level social and cultural data from the National Institute of Statistics (INE) in Chile. This dataset encompasses a wide range of socio-economic indicators that help characterize each district, including average income and the degree of rurality. By incorporating this data into our analysis, we gain a comprehensive understanding of the socio-economic context in which electoral processes unfold.

Since an important choice among voters was not voting (turnout was between 27% and 53% among districts), we focus on the percentage of votes over the total number of registered voters. This also ensures that there is no multicollinearity between observations in the sample. (Rekkas 2007)

Moreover, we use the campaign spending as a percentage of the total amount of money allowed in the campaign. This makes campaigns comparable among candidates and districts. However, the mean expenditure is 5,4% of the limit, and the median is 2,2%. The maximum spent was 80,7% while most of the candidates (99%) spent less than 50% of the limit.

Campaign expenditure is endogenous. Indeed, there are unobservable characteristics such as charisma that may both increase the amount of money a candidate can collect and the number of votes he can receive. Therefore, a promising candidate may not only get a lot of votes because she spent a lot of money, but she may also be able to spend a high amount of money because she

has a high possibility of getting many votes. (Rekkas 2007) (Benoit and Marsh 2010)

Therefore, we will use an instrumental variable approach that starts by explaining how candidates chose their campaign strategy and then studies how this campaign strategy affects the number of votes obtained in the election. (Benoit and Marsh 2010) (Sovey and Green 2011) (Gamboa and Morales 2021)

The selected instrumental variable was the magnitude of the district, measured as the number of registered voters in every district. Registered population affects campaign expenditure because it has increasing returns to scale: reaching a big audience is more expensive than reaching a little audience, but in a less than proportional relation. However, there is no reason why any candidate could get a higher percentage of votes just because she runs in a larger district.

Since many observations of expenditure are close to zero, many predicted values of expenditure in the second stage of the estimation may be negative. Hence, we use a transformation that keeps any predicted value between zero and one.

$$lnw_{cd} \equiv \ln \frac{w_{cd}}{1 - w_{cd}} = x_{cd}\beta_1 + z_d\gamma_1 + y_{cd}\alpha_1 + \mu_{cd}$$

where x_{cd} are candidate's characteristics (gender, incumbency, age, squared age, traditional party affiliation, political party independence or not traditional party affiliation, and previous experience as district or national representation) z_d are

district characteristics (average income and percentage of territorial rurality). y_{cd} is the instrumental variable (magnitude of the district in terms of registered voters) related to the campaign strategy but not the percentage of votes cast, and μ_{cd} is a stochastic error.

Using the predicted value of campaign spending from the first stage, $\widehat{w}_{cd}$, the share of the total registered voters that voted for candidate c in district d is estimated in the second stage as (Rekkas, 2007):

$$\ln v_{cd} \equiv \ln \left(\frac{v_{cd}}{1 - v_{cd}} \right) = x_{cd}\beta_2 + z_d\gamma_2 + \alpha_2\widehat{w}_{cd} + \varepsilon_{cd}$$

For the cases of Deputies elections, both in 2017 and 2021, in the second stage, we also added incumbency and its crossed effect with predicted expenditure as variables to control for that effect (which does not exist in the Conventional Convention case).

This procedure was applied to the 2021 Constitutional Convention data and to the 2017 and 2021 Deputies Chamber elections which allows us to make a comparison between the three electoral processes and observe if there is any difference in the behavior of results within them.

Although there are no standard tests to ensure endogeneity in this modified two stages least squares model, we performed modified tests (Baum, Schaffer and Stillman 2003) to prove that we actually face endogeneity (see Appendix 1).

Main Results

We present the results in three-column tables to emphasize the effects of gender in every regression, simplifying the comparison between the three electoral processes. The first column presents the effect of variables on the whole sample of candidates while the second and third column show the effect of variables only on male and female candidates, respectively. Notice that this allows to compare not only the level effect of gender on the dependent variables but also the change in parameters from one group to the other.

Table 1 shows the effects of candidate characteristics as well as district characteristics on fundraising for candidates for Conventional Representatives.

Gender has no significant effects on the level of campaign fundraising, mainly explained by double parity rule imposed to this process. All independent lists had to present at least half of female candidates to participate of the process. The gender prioritization in the ballot format was an additional incentive for parties to widely support women candidates, which should be similar in every district. Moreover, favorizing men would be counterproductive because of the exit parity rule: if only men were elected, half of them would be switched with some other female candidates.

The age of female candidates is significant and positive, showing that older women can raise more money than younger candidates. However, this effect is

strong enough to appear as an effect for the whole sample, but it has no impact on male candidates.

Traditional political party membership is significant and has a positive impact on both women's and men's fundraising. This is consistent with the relevance of political parties to getting financial support. (Jenkins 2007) (Piscopo, Hinojosa, et al. 2022). On the contrary, independent candidates had no advantage on the fundraising process.

Districts with higher income levels and backgrounds of candidates on elected political chairs at the district or national level have a significant and positive effect on fundraising for female and male candidates, even when there is no incumbency in this process. Moreover, this effect is significantly higher for male candidates than for female candidates.

Finally, as the district grows in terms of potential voters, smaller is the campaign spending, both for men and women. This could be related to rurality in the sense that is more expensive and more ineffective to campaign in rural areas, but the percentage of rural inhabitants in the district is not significant to the fundraising outcome. Magnitude has this negative effect because the bigger the district, the higher the spending limit, and as campaign spending depends on the district and not on voters, the dominant effect is negative. Moreover, as pointed out above, there may be scale effects. The relevance of this variable is crucial to use it as

instrumental variable because, in the second stage of regression, the effect of magnitude does not impact the electoral outcome in terms of vote percentage.

Table 1 Effects of Gender on Campaign Spending Limit

	(1) All	(2) Men	(3) Women
Candidate Gender	-.046		
	(.076)		
Incumbent			
Candidate Age	.04**	.029	.064**
	(.018)	(.022)	(.027)
Age Squared	0*	0	-.001**
	(0)	(0)	(0)
Traditional Left Pact	1.503***	1.796***	1.233***
	(.092)	(.123)	(.122)
Traditional Right Pact	2.567***	3.004***	2.175***
	(.096)	(.13)	(.1)
Independent Candidates	.014	.061	-.052
	(.104)	(.124)	(.141)
District Income	.613***	.879***	.315***
	(.083)	(.13)	(.084)
Background in District or Higher Elected Office	1.169***	.813***	2.065***
	(.254)	(.291)	(.734)
Percentage of Rural Population	-.08	.148	-.291
	(.309)	(.52)	(.324)
Magnitude	-1.023***	-1.176***	-.879***
	(.205)	(.349)	(.182)
_cons	-5.131***	-5.122***	-5.415***
	(.481)	(.553)	(.653)
Observations	1241	606	635
R-squared	.404	.497	.323

Standard errors are in parentheses
*** $p<.01$, ** $p<.05$, * $p<.1$

On the second stage of regression, presented in Table 2, gender plays two roles: first, it is a characteristic that increases the percentage of votes for women *per se*, and second, it changes the way other characteristics affect the electoral outcome.

The age of candidates is not significant in gaining a major proportion of votes, either for female or male candidates.

Belonging to a traditional party, for instance, improves only male and left-leaning candidate outcomes and has no effect on female candidates' success.

Political independence of candidates was a desirable characteristic for elected representatives, mainly because of the origin of the organism, which was born as a response to popular demands for social and political changes, which involved a renovation of public decision-makers. (Piscopo and Siavelis 2021)

Higher income levels in the districts did not favor neither male nor female candidates in enhancing their share of votes.

Previous experience in an elected political position is significant and positive to male candidates, but it has no impact on female electoral results.

The rurality in the district had also a positive effect on gained percentage of votes for both male and female candidates.

Finally, predicted expenditure was significant in enhancing the share of votes for all candidates, but specially for women which may be explained by the double parity rule effect.

Table 2. Effects of Money Raised on Vote Percentages

	(1) All	(2) Men	(3) Women
Candidate Gender	.146***		
	(.048)		
Incumbent			
Candidate Age	.026	.025	.034
	(.017)	(.019)	(.022)
Age Squared	0	0	0
	(0)	(0)	(0)
Traditional Left Pact	.3***	.56***	.045
	(.099)	(.114)	(.111)
Traditional Right Pact	.138	.412	-.146
	(.234)	(.279)	(.184)
Independent Candidates	.428***	.543***	.313***
	(.102)	(.124)	(.108)
District Income	-.144	-.159	-.178
	(.192)	(.223)	(.17)
Background in District or Higher Elected Office	.581*	.618**	.419
	(.293)	(.285)	(.529)
Percentage of Rural Population	1.408***	1.536***	1.299***
	(.42)	(.414)	(.469)
explimhat_a2021C	4.287**		
	(1.832)		
explimincha~2021C			
explimhat_m2021C		3.309**	
		(1.473)	
explimincha~2021C			
explimhat_w2021C			5.87***
			(1.696)
explimincha~2021C			
_cons	-6.546***	-6.657***	-6.412***
	(.392)	(.483)	(.477)
Observations	1278	629	649
R-squared	.183	.256	.128

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1

Now, we compare these results with previous and similar elections, namely the 2017 election for the Chamber of Deputies. Although that election had entry parity rule, it was softer in the sense parties had to present parity in their list at a national level, i.e., if they presented 20 candidates in 10 districts, they only needed to have

10 men and 10 women on the list, but they could present 2 men in one district and two women in another. Entry parity rule on the Constitutional Convention forced parties to present half male and half female candidates on each district. Moreover, Deputies elections had no exit parity rule, hence differences on the effects show how these harder rules impact on fundraising, campaign, and electoral outcomes. Unfortunately, this effect is mixed with the non-existence of incumbency, and we cannot identify which of these features drives our results.

In Table 3 and Table 4, we show our findings using the same involved variables and the same modified 2SLS model for the 2017 Chamber of Deputies' dataset.

Even considering the differences between these two political organisms, results suggest that softer gender parity rules should increase the fundraising difficulties for women and, consequently, worsen the electoral success of female candidates.

Indeed, in terms of fundraising, Table 3 shows that women obtained less monetary support for campaign issues than men in 2017, which is a substantial difference in comparison to the Constitutional Convention process.

The incumbency of candidates was an important factor in fundraising, especially for female candidates, which is consistent with literature (Benoit and Marsh 2010) (Green 1998). Moreover, as in the conventional process, political background enhances the fundraising ability of candidates.

The age of candidates is not significant in this case, contrary to what the conventional dataset shows.

In this case, affiliation with a traditional party is an important factor to raise more money, and not belonging to a traditional list only favors women's campaign spending.

The effect of district characteristics also differs from one election to another. Contrary to Conventional candidates, a higher average income in the district increases the fundraising of male candidates, but it decreases fundraising of female candidates.

The rurality effect remains not significant in both fundraising processes.

Table 3 Effects of Gender on Campaign Spending Limit Congress Elections 2017

	(1) All	(2) Men	(3) Women
Candidate Gender	-.226**		
	(.084)		
Incumbent	1.056***	.775***	1.816***
	(.135)	(.157)	(.236)
Candidate Age	.034	.004	.07*
	(.023)	(.035)	(.036)
Age Squared	0*	0	-.001*
	(0)	(0)	(0)
Traditional Left Pact	1.766***	1.875***	1.583***
	(.1)	(.133)	(.13)
Traditional Right Pact	2.143***	2.306***	1.891***
	(.139)	(.189)	(.173)
Independent Candidates	-.245**	-.081	-.406***
	(.095)	(.132)	(.144)
District Income	.208	.66***	-.318*
	(.133)	(.151)	(.158)
Background in District or Higher Elected Office	.419***	.531***	.428**
	(.118)	(.138)	(.196)
Percentage of Rural Population	-.388	.053	-.939
	(.359)	(.33)	(.653)
Registered Voters	-1.334***	-1.323***	-1.296***
	(.247)	(.223)	(.405)
_cons	-3.994***	-3.612***	-4.645***
	(.635)	(.841)	(.968)
Observations	919	545	374

R-squared	.536	.572	.48

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1

In the electoral outcome arena, Table 4 shows the differences that we expected because of the softer parity rules imposed on that election compared to the Constitutional Convention process.

The main difference is, precisely, the effect of gender on the percentage of votes, showing the historical disadvantage that women had faced in previous elections.

According to previous research, incumbency is a key factor in the success of candidates, especially women who compete for reelection.

In 2017, men of traditional left and right parties gained major share of votes than independent candidates, but for women the political affiliation was irrelevant.

In addition to the relevance of incumbency in Chamber of Deputies elections, the background in similar or higher political positions favored male candidates, but it was not meaningful for female candidates.

The district characteristics show that while higher income levels do not translate into a higher percentage of votes for candidates, those districts with a high percentage of rural populations favored only male candidates.

Finally, campaign spending increases the share of votes obtained by all candidates, but being an incumbent reduces this positive effect on a deeper level for female candidates.

In other words, female candidates faced disadvantages for fundraising and winning elections in 2017 that seemed not to appear in the Constitutional Convention process.

Table 4. Effects of Money Raised on Vote Percentages Congress Elections 2017

	(1) All	(2) Men	(3) Women
Candidate Gender	-.205***		
	(.067)		
Incumbent	2.544***	1.971***	3.778***
	(.289)	(.427)	(.492)
Candidate Age	.002	-.014	.027
	(.015)	(.021)	(.022)
Age Squared	0	0	0
	(0)	(0)	(0)
Traditional Left Pact	.219*	.491***	-.042
	(.117)	(.145)	(.185)
Traditional Right Pact	.567***	.947***	.233
	(.167)	(.207)	(.226)
Independent Candidates	.038	.143	-.05
	(.063)	(.089)	(.1)
District Income	-.077	.192	-.37
	(.296)	(.306)	(.326)
Background in District or Higher Elected Office	.294**	.38**	.191
	(.112)	(.151)	(.215)
Percentage of Rural Population	.515*	1.176***	-.353
	(.291)	(.259)	(.471)
explimhat_a2017D	6.817***		
	(1.637)		
explimincha~2017D	-8.33***		
	(1.496)		
explimhat_m2017D		4.405**	
		(1.72)	
explimincha~2017D		-5.566***	
		(1.772)	
explimhat_w2017D			9.301***
			(2.768)
explimincha~2017D			-12.458***
			(3.127)
_cons	-5.77***	-5.617***	-6.173***
	(.413)	(.568)	(.539)
Observations	960	563	397
R-squared	.473	.535	.348

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1

As a corollary, we consider it interesting to observe what happened with the following Chamber of Deputies elections in 2021, which occurred some months after the Constitutional Convention electoral process in 2021.

Taking the *pathbreaker hypothesis*, which establishes that regular female participation in political contests increases female participation in the next electoral process, such a change could eventually break historical underrepresentation in politics. (Bhalotra, Clots-Figueras and Iyer 2018)

Being aware that it is just one event observation and that these results are not conclusive in calling this a *path-braker event* but using the same methodology and including the same variables to make the three models comparable, we take the electoral dataset of the 2021 Chamber of Deputies elections and obtain the results shown in Tables 5 and 6.

In terms of campaign spending, behavior of variables is closer to the Constitutional Convention process than to the Chamber of Deputies contest in 2017.

The gender of candidates has no influence on fundraising; older women are more likely to receive financial support for political campaigns; traditional parties' affiliation seems to assure higher levels of collected money as well as background in similar public positions. All these coincide with the results obtained from the constitutional convention dataset.

The district percentage of rural population is equally not statistically significant, and the magnitude of the district has the same negative effect on electoral expenditure for female and male candidates.

The only difference is in the average income of the districts, which shows no effects on fundraising in chamber of deputies' election instead of the positive effect that this variable shows in the constitutional election.

Table 5 Effects of Gender on Campaign Spending Limit Congress Elections 2021

	(1) All	(2) Men	(3) Women
Candidate Gender	-.107		
	(.091)		
Incumbent	1.027***	.624***	1.767***
	(.19)	(.221)	(.215)
Candidate Age	.081***	.089**	.073
	(.026)	(.034)	(.055)
Age Squared	-.001***	-.001**	-.001
	(0)	(0)	(.001)
Traditional Left Pact	1.595***	1.646***	1.531***
	(.165)	(.205)	(.179)
Traditional Right Pact	2.118***	2.256***	1.984***
	(.131)	(.133)	(.215)
Independent Candidates	-.029	-.093	.063
	(.143)	(.19)	(.138)
District Income	.083	.285*	-.075
	(.205)	(.143)	(.363)
Background in District or Higher Elected Office	.431***	.486***	.704***
	(.121)	(.15)	(.24)
Percentage of Rural Population	.296	.077	.68
	(.464)	(.572)	(.842)
Registered Voters	-1.188***	-1.453***	-.884**
	(.281)	(.317)	(.384)
_cons	-5.811***	-5.908***	-5.928***
	(.693)	(.868)	(1.266)
Observations	1216	671	545
R-squared	.312	.36	.258

Standard errors are in parentheses

In Table 6, we can see that, even when the gender of candidates does not have the significance and positive effect on the percentage of votes in the chamber of deputies' election in 2021, it does not have the negative effect that it had in the same electoral process in 2017.

On the contrary, incumbency remains the only statistically significant and positive factor in the percentage of votes for both deputies' elections.

All the other personal characteristics seem not to be determinants of the share of votes that every candidate obtained, including the background of the candidates.

The average income of the district is not significant for the percentage of votes, but it is statistically significant and positive for the effect of the rurality of the district, which favors both female and male candidates. These are the same resulting effects obtained from the constitutional elections' dataset.

Finally, the effect of campaign spending is statistically significant and positive, with the same observed effect in the three models. The incumbency shows the same significant and reducing effect on the expenditure shown in the previous deputies' election.

Table 6. Effects of Money Raised on Vote Percentages Congress Elections 2021

	(1) All	(2) Men	(3) Women
Candidate Gender	.077 (.054)		
Incumbent	2.512***	2.254***	2.742***

	(1)	(2)	(3)
	(.144)	(.2)	(.229)
Candidate Age	.002	.033*	-.027
	(.013)	(.018)	(.021)
Age Squared	0	0**	0
	(0)	(0)	(0)
Traditional Left Pact	-.146	.317*	-.447**
	(.17)	(.185)	(.184)
Traditional Right Pact	-.399	-.047	-.392
	(.264)	(.265)	(.341)
Independent Candidates	-.096	-.051	-.154*
	(.07)	(.079)	(.084)
District Income	.239	.227	.334*
	(.234)	(.312)	(.19)
Background in District or Higher Elected Office	-.023	0	-.138
	(.114)	(.141)	(.235)
Percentage of Rural Population	1.462***	1.614***	1.442***
	(.371)	(.384)	(.439)
explimhat_a2021D	13.27***		
	(2.579)		
explimincha~2021D	-13.042***		
	(1.885)		
explimhat_m2021D		9.299***	
		(2.524)	
explimincha~2021D		-9.348***	
		(1.93)	
explimhat_w2021D			13.224***
			(3.558)
explimincha~2021D			-14.126***
			(2.868)
_cons	-5.99***	-6.709***	-5.285***
	(.402)	(.463)	(.515)
Observations	1256	691	565
R-squared	.345	.406	.27

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*

This is a very preliminary approach to the pathbreaker study using Chilean data. Following the course of gender parity and female representation would be an interesting matter for further research.

Discussion and Conclusion

The main goal of the present study is to determine if the political underrepresentation of women is related to campaign spending and incumbency in Chilean elections.

The new gender parity rules applied to the constitutional convention electoral process gave us an opportunity to observe electoral behavior towards female candidates in totally open-seat elections.

Previous studies suggested that there are two main reasons that explain the lack of female representation in political statements. The first is the low financial support that women obtain from private donors or even their own parties. This supposes a problem because women require higher levels of campaign expenditure to get the same number of votes in elections, and if the process of fundraising becomes harder, many women will desist from a political career even when they meet the requirements of the available political position.

The second reason is that, in the presence of incumbency, female challengers face a disadvantage because, even if they get enough financial support, the incumbent, who is a man with a higher probability, does not need to expend much money to make himself known.

We also proposed a new method to face endogeneity in a nonlinear structure. We used a two-stage least squares model and one instrumental variable, the

magnitude of the district in terms of registered voters but included the logistic transformation of the predicted values of endogenous variable in the interim stage to avoid predictions out of range.

With this variation of the estimation model and the constitutional convention dataset, we find that, in the absence of incumbency, fundraising was effective in increasing the percentage of votes that women obtained in the election.

These results seem to be consistent with previous research, which claims that incumbency is the main reason for female political underrepresentation.

Furthermore, when we compare these results with the similar electoral process in Chile, namely the chamber of deputies' elections in 2017, we observe how gender was a handicap both to fundraising and obtaining a bigger share of votes with that dataset.

It is also surprising how the personal and district characteristics of the candidates affect electoral results differently when there is incumbency and less stringent gender rules and when there are not. Although there are other factors that the model does not consider, such as the social and political pressure to change the way institutions favor elite groups, these two combined conditions clearly affected the voters' behavior towards female candidates.

As an additional consideration for future research, we repeated the comparison process using chamber of deputies' elections in 2021, after constitutional elections, and it was interesting to observe that there were different effects of the

same variables on the percentage of votes for female candidates, even when the gender quotas followed the same rules as in the 2017 process.

The results for the deputies' electoral process in 2021 were indeed closer to the Constitutional Convention process than to the previous deputies' electoral process of 2017.

The significancy of the present results could help authorities to diminish the gender gap in political positions by implementing simple and ephemeral rules. Since it is important to approximate a new democratic model that considers women's issues and to recognize the need to include a female vision of political authority exercise as soon as possible, these study opens the possibility that these changes could be obtained on only two or three electoral cycles.

Increasing female representation will reduce the bias on public policy focus when making political decisions, and that will increase the level of democratic legitimacy of those decisions. (Clayton, O'Brien and Piscopo 2019)

Many other excluded groups claim to be heard, but in women's demands for equity in political participation, there is the additional fact that they are not a minority group but represent half of the population.

A further study focused on the pathbreakers hypothesis should examine if this experience changed the pattern of electoral results for female candidates breaking the crystal ceiling in politics or if future elections continue to exclude

women from political positions and it will be necessary to implement still stricter

gender parity rules to achieve equal rights.

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Appendix 1

Table A.1: Endogeneity Test for the Constitutional Convention Dataset

	(1) All	(2) All	(3) All	(4) Men	(5) Men	(6) Men	(7) Women	(8) Women	(9) Women
Candidate Expenditure over Limit	1.87***	1.922***	2.519***	1.113**	1.165***	1.633***	3.432***	3.572***	4.518***
	(.322)	(.331)	(.427)	(.418)	(.418)	(.47)	(.57)	(.581)	(.792)
Expenditure over Limit times Incumbent									
Candidate Gender	.163***	.166***	.178***						
	(.034)	(.035)	(.037)						
Incumbent									
Candidate Age	.03**	.031**	.032**	.03	.029	.029	.039**	.039**	.039**
	(.014)	(.014)	(.014)	(.018)	(.018)	(.018)	(.017)	(.017)	(.017)
Age Squared	0**	0**	0**	0	0	0	0**	0**	0**
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Traditional Left Pact	.42***	.41***	.372***	.727***	.716***	.673***	.139	.127	.088
	(.064)	(.064)	(.066)	(.063)	(.064)	(.07)	(.093)	(.094)	(.097)
Traditional Right Pact	.426***	.405***	.295**	.792***	.773***	.665***	.063	.036	-.078
	(.089)	(.095)	(.109)	(.089)	(.093)	(.11)	(.104)	(.109)	(.128)
Candidates Not Affiliated to any Party	.411***	.426***	.452***	.53***	.547***	.578***	.304***	.316***	.338***
	(.079)	(.077)	(.079)	(.09)	(.088)	(.093)	(.091)	(.089)	(.087)
Average district Income	-.204	-.191	-.198	-.162	-.157	-.172	-.285*	-.271	-.277
	(.179)	(.178)	(.176)	(.198)	(.2)	(.205)	(.164)	(.163)	(.163)
Dummy for Occupied Previous District or Higher Elected Office	.954***	.945***	.887***	.86***	.863***	.852***	.858***	.812***	.591***
	(.171)	(.168)	(.169)	(.215)	(.209)	(.197)	(.165)	(.169)	(.193)
Percentage of Rural Population	1.253***	1.293***	1.327***	1.441***	1.462***	1.47***	1.121**	1.168**	1.219***
	(.374)	(.376)	(.379)	(.363)	(.366)	(.378)	(.413)	(.423)	(.424)
eps_a2021C	3.232***	1.979***							
	(.356)	(.156)							
Residuals	-.237***		.329***						
	(.065)		(.039)						
eps_m2021C				3.304***	2.115***				
				(.609)	(.192)				
Residuals				-.228*		.365***			
				(.112)		(.045)			
eps_w2021C							2.809***	1.705***	
							(.507)	(.2)	
Residuals							-.205**		.271***
							(.091)		(.053)
_cons	-8.192***	-7.599***	-6.654***	-8.414***	-7.817***	-6.752***	-7.837***	-7.32***	-6.492***
	(.4)	(.351)	(.313)	(.544)	(.486)	(.451)	(.484)	(.397)	(.375)
Observations	1241	1241	1241	606	606	606	635	635	635
R-squared	.492	.487	.463	.532	.529	.509	.449	.444	.423

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
* Running a regression of the independent variable on the exogenous variables and the residuals of the first stage should show no significance of these residuals when there is exogeneity. We perform the test of both the residuals as delivered from the first stage and logistically transformed.

Table A.2: Endogeneity Test for the Chamber of Deputies 2017 Dataset

	(1) All	(2) All	(3) All	(4) Men	(5) Men	(6) Men	(7) Women	(8) Women	(9) Women
Candidate Expenditure over Limit	1.988***	1.858**	2.335***	1.362**	1.072	1.572	3.39***	3.408***	3.815***
	(.514)	(.712)	(.839)	(.568)	(.823)	(.987)	(.475)	(.484)	(.589)
Expenditure over Limit times Incumbent	-1.709***	-1.45**	-1.471*	-1.475**	-.995	-.924	-2.964***	-2.951***	-2.974***
	(.541)	(.689)	(.815)	(.644)	(.813)	(.967)	(.891)	(.888)	(.931)
Candidate Gender	-.219***	-.226***	-.221***						
	(.039)	(.043)	(.048)						
incumbente	1.421***	1.36***	1.3***	1.137***	1.042***	.986***	2.182***	2.172***	2.07***
	(.127)	(.131)	(.141)	(.136)	(.142)	(.152)	(.232)	(.23)	(.233)
Candidate Age	.001	.001	-.001	-.018	-.019	-.02	.022*	.022*	.022
	(.008)	(.009)	(.009)	(.012)	(.012)	(.013)	(.012)	(.012)	(.013)
Age Squared	0	0	0	0	0	0	0**	0**	0*
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Traditional Left Pact	.584***	.595***	.55***	.769***	.801***	.752***	.279***	.278***	.248**
	(.088)	(.097)	(.104)	(.119)	(.126)	(.133)	(.08)	(.082)	(.089)
Traditional Right Pact	1.033***	1.042***	.972***	1.296***	1.33***	1.246***	.623***	.62***	.569***
	(.091)	(.108)	(.126)	(.128)	(.143)	(.168)	(.087)	(.088)	(.097)
Candidates Not Affiliated to any Party	-.013	-.019	-.022	.131*	.121	.11	-.142**	-.142**	-.134**
	(.054)	(.054)	(.053)	(.074)	(.077)	(.081)	(.052)	(.052)	(.053)
Average district Income	-.059	-.057	-.087	.305	.315	.26	-.465	-.465	-.473
	(.319)	(.31)	(.297)	(.335)	(.334)	(.327)	(.303)	(.302)	(.282)
Dummy for Occupied Previous District or Higher Elected Office	.5***	.481***	.433***	.634***	.608***	.541***	.409***	.408***	.393***
	(.077)	(.08)	(.085)	(.091)	(.09)	(.094)	(.136)	(.136)	(.138)
Percentage of Rural Population	.58*	.6*	.571*	1.188***	1.232***	1.195***	-.28	-.282	-.307
	(.291)	(.296)	(.294)	(.295)	(.305)	(.301)	(.333)	(.336)	(.348)
eps_a2017D	4.31***	2.434***							
	(.752)	(.222)							
Residuals	-.376**		.418***						
	(.143)		(.046)						
eps_m2017D				4.805***	2.48***				
				(.786)	(.287)				
Residuals				-.469***		.408***			
				(.151)		(.06)			
eps_w2017D							2.43***	2.189***	
							(.876)	(.221)	
Residuals							-.047		.406***
							(.189)		(.055)
_cons	-7.825***	-6.87***	-5.594***	-7.934***	-6.737***	-5.431***	-7.167***	-7.048***	-5.941***
	(.431)	(.306)	(.262)	(.5)	(.353)	(.348)	(.463)	(.382)	(.345)
Observations	919	919	919	545	545	545	374	374	374
R-squared	.752	.747	.726	.767	.758	.733	.725	.725	.719

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
* Running a regression of the independent variable on the exogenous variables and the residuals of the first stage should show no significance of these residuals. We perform the test of both the residuals as delivered from the first stage and logistically transformed.

Table A.3: Endogeneity Test for the Chamber of Deputies 2021 Dataset

	(1) All	(2) All	(3) All	(4) Men	(5) Men	(6) Men	(7) Women	(8) Women	(9) Women
Candidate Expenditure over Limit	3.054***	3.162***	5.481***	2.652**	2.688**	4.518***	3.92***	4.156***	6.938***
	(.742)	(.773)	(1.042)	(.976)	(.988)	(1.234)	(.738)	(.765)	(.937)
Expenditure over Limit times Incumbent	-2.472***	-2.488***	-3.81***	-2.303**	-2.286**	-3.199**	-2.034	-2.17	-4.152**
	(.866)	(.886)	(1.104)	(.957)	(.965)	(1.179)	(1.265)	(1.298)	(1.56)
Candidate Gender	.082*	.085*	.112**						
	(.043)	(.043)	(.046)						
incumbente	1.745***	1.737***	1.809***	1.499***	1.494***	1.58***	1.895***	1.889***	1.935***
	(.138)	(.14)	(.16)	(.188)	(.189)	(.205)	(.196)	(.202)	(.243)
Candidate Age	.029**	.026**	.019	.049***	.048***	.044**	.001	-.003	-.016
	(.011)	(.012)	(.014)	(.015)	(.015)	(.019)	(.016)	(.017)	(.02)
Age Squared	0**	0**	0	-.001***	-.001***	-.001**	0	0	0
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Traditional Left Pact	.281***	.276***	.139	.58***	.587***	.502***	-.087	-.111	-.287***
	(.077)	(.075)	(.087)	(.111)	(.108)	(.112)	(.071)	(.072)	(.078)
Traditional Right Pact	.332***	.312***	.025	.483***	.473***	.22	.162	.129	-.173*
	(.095)	(.097)	(.114)	(.156)	(.156)	(.167)	(.106)	(.107)	(.097)
Candidates Not Affiliated to any Party	-.142**	-.132**	-.095	-.113*	-.102	-.056	-.141*	-.137*	-.106
	(.059)	(.059)	(.064)	(.061)	(.063)	(.065)	(.073)	(.072)	(.073)
Average district Income	.141	.146	.11	.204	.204	.156	.107	.12	.091
	(.235)	(.232)	(.218)	(.314)	(.315)	(.301)	(.165)	(.158)	(.155)
Dummy for Occupied Previous District or Higher Elected Office	.207**	.198**	.126	.291***	.285**	.203*	.222*	.207	.111
	(.081)	(.083)	(.089)	(.104)	(.104)	(.114)	(.128)	(.131)	(.143)
Percentage of Rural Population	1.713***	1.699***	1.494***	1.724***	1.721***	1.566***	1.687***	1.659***	1.41***
	(.333)	(.339)	(.333)	(.371)	(.374)	(.37)	(.317)	(.321)	(.31)
eps_a2021D	2.287***	1.761***							
	(.217)	(.157)							
Residuals	-.086***		.137***						
	(.027)		(.038)						
eps_m2021D				2.234***	1.827***				
				(.304)	(.172)				
Residuals				-.069		.167***			
				(.045)		(.05)			
eps_w2021D							2.074***	1.544***	
							(.25)	(.239)	
Residuals							-.081**		.101**
							(.03)		(.039)
_cons	-7.79***	-7.457***	-6.36***	-8.27***	-8.03***	-6.968***	-6.978***	-6.608***	-5.486***
	(.354)	(.36)	(.392)	(.43)	(.43)	(.47)	(.417)	(.421)	(.481)
Observations	1216	1216	1216	671	671	671	545	545	545
R-squared	.575	.569	.515	.607	.604	.559	.537	.53	.479

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1
* Running a regression of the independent variable on the exogenous variables and the residuals of the first stage should show no significance of these residuals. We perform the test of both the residuals as delivered from the first stage and logistically transformed.