Is There Gender Bias Among Voters? Evidence from the Chilean Congressional Elections

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Abstract

I exploit the unique institution of gender-segregated voting booths in Chile, allowing the use of actual voting data, instead of self-reported surveys, to test for gender bias among voters. I find evidence of a small but significant negative gender bias: women overall are less likely than men to vote for female candidates. The effect is mainly driven by center-right voters. Selection and candidates' quality do not explain away the results. These results are consistent with a model in which female and male legislators vote alike, and women voters living in municipalities where traditional gender roles are more prevalent have a preference for center-right male candidates instead of female candidates.

Keywords: Gender bias, Women and politics, Gender-segregated voting booths.

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1 Introduction

Since the enfranchisement of women, researchers have debated whether female voters would be more likely to support candidates of their same gender than would men. In his 1955's work "The Political Role of Women", Duverger analyzed a survey on the political role of women in France conducted in 1953, just 9 years after it included women in the franchise. When asked about their preferences for a male or female candidate in an election where both candidates have the same political interests and are equally competent, women were slightly more likely than men to choose a female candidate (6% vs. 1%), although a majority of women and men would still opt for the male candidate (51% vs. 60%). He argues that the reason why he finds little support for female candidates among women is that many of them "seem to be more uncompromising than men in this regard, and more anti-feminist": When asked whether standing at a municipal election would be unsuitable for women, 46% of women agreed, compared to 38% of men.

More recent articles have analyzed this question using either surveys or exit polls (e.g. Paolino, 1995; Dolan, 1998, 2008a and 2008b). Dolan (2008b) provides a comprehensive summary of the political science literature analyzing this phenomenon. She affirms that a variety of results show that women voters are more likely to support female candidates than men, but "the relationship between women voters and female candidates is often conditioned by forces beyond a shared sex identity". However, analyzing this question using survey data and exit polls can be misleading for at least two reasons. First, polls are carried out using small samples, and are usually not designed to be representative for each gender group. Second, Stout and Kline (2010) show that pre-election polls systematically underestimate support for female candidates. Third, there is evidence that the gender of the interviewer can affect the responses differentially depending on the respondent's gender, known in the literature as the gender-of-interviewer effect (Kane and Macaulay, 1993; Huddy, Billig, Bracciodieta, Hoeffler, Moynihan and Pugliani, 1997; Flores-Macias and Lawson, 2008; Benstead, 2014). Responses can be also affected by the interviewer's religiosity (Blaydes and Gillum, 2013) or the language

of the interview (Lee and Pérez, 2014).[1]

In this paper I critically examine the traditional view that voters generally prefer candidates of their same gender. Using data from a unique setup—the Chilean congressional elections in 1989–2009, where men and women vote in separate voting booths—I am able to overcome the issues endemic in previous studies relying on the use of surveys or exit polls to analyze the support for female candidates. Gender-segregated voting allows me to use *actual* voting data and avoid the shortcomings associated with surveys and exit polls.[2]

I find a negative but small gender bias among voters, i.e. women voters are slightly less likely to vote for female candidates than men voters are.[3] This effect decomposes into a positive gender bias among center-left voters and a negative gender bias among center-right voters. These results are not explained away by the inclusion of socio-demographic controls at the municipality level or by controls for candidates' political experience. The result is robust to restricting the sample to close within-coalition elections, lessening the possibility that these results are driven by differences in candidates' unobservable characteristics.

Is this result due to an intrinsic preference (or distaste) of center-right women for same-sex representation, or is it driven by gender differences on policy? I discuss potential mechanisms which could give rise to these results. First I analyze whether gender identity, defined as the existence of social norms about gender roles, could induce a distaste of women voters for female candidates (Akerlof and Kranton, 2000). This channel finds some —though not very robust— support in my data: women living in municipalities with a larger share of married couples or with a larger gap in labor force participation are less likely to vote for center-right female candidates than men. I then analyze roll-call voting data from the Chilean Chamber

[1]Surveys can present additional problems. Epstein (2006) argues that there is a systematic upward bias in turnout in surveys such as the National Election Studies (NES). Funk (2016) shows that preferences elicited by surveys can be biased when compared to preferences revealed at the ballot box, specially on issues of gender, race and gay rights.

[2] In the Online Appendix A I show that using electoral surveys in Chile to estimate voters' preferences for same-gender representation could also give a biased result. Using the Latinobarómetro Survey, I find that there is a gender-of-interviewer effect in Chile when individuals are asked to evaluate the first female president Michelle Bachelet, or when asked about women's issues or gender equality.

[3]This definition of gender bias is different from the political gender gap, which compares the relative support of men and women for the left. The literature has used the terms "gender gap" and "gender affinity" to describe a preference of voters for same-sex candidates.

of Deputies, and find that female legislators in the center-right coalition are equally likely than males to vote in opposition to the majority of their coalition. This result holds even when looking at legislation pertaining to so called women's issues (family, government, labor, education and justice). Even though I am not able to identify pro-female legislation due to the lack of voting scores for the Chamber of Deputies, the evidence suggests that center-right female legislators are not significantly more likely to deviate from their coalition by adopting a stronger pro-women stance on women's issues. Taken together, these results suggest that the negative gender bias is more likely to be explained away by female voters following the prescribed behavior given by traditional social norms.

By showing the existence of a small but statistically significant distaste of women voters for center-right female candidates in congressional elections, I add a new dimension to the discussion of gender quotas and reserved seats: women might not always prefer a female leader over a male one. The results are compatible with previous research showing that women do not always perform better when evaluated by a committee with a larger share of women (Bagues and Esteve-Volart, 2010; Bagues, Sylos-Labini and Zinovyeva, 2017).

The results also give an alternative interpretation to previous research on U.S. elections, which show that women feel more positively than men towards female Democratic candidates, but are indifferent towards female Republican candidates (Dolan, 2008b). Dolan's conjecture is that women may experience "cross pressures", with gender considerations bringing them closer to female candidates but the candidate's party (Republican) pulling them away. I suggest that these cross pressures could have the opposite sign, with women supporters of the Republican party being pulled away from female candidates because of gender considerations. Finally, I provide a cautionary tale for the use of surveys when analyzing gender differences in voting behavior.

The remainder of the paper is organized as follows. Section 2 provides the context for female enfranchisement and gender-segregated voting and describes the Chilean electoral system. Section 3 describes the sources of my data, while section 4 presents the econometric framework. Section 5 presents the main results of the paper, while section 6 analyzes possible

mechanisms using roll-call voting data and the *Latinobarómetro* Survey. Finally, section 7 states the conclusion.

2 The Chilean congressional electoral system

This section describes the several unique features of the Chilean Electoral System, which make this dataset unusually valuable. The first is that women and men vote in separate voting booths, which makes it possible to analyze voting data by gender. Secondly the structure of the two-member congressional districts and the special rules that determine the winners in each district mean that most political competition occurs within coalitions rather than across coalitions, which allows me to analyze gender bias for each coalition independently.

2.1 Women and the vote

Although the women's suffrage movement started in Chile as early as the 1870s, women were finally allowed to vote for the first time in the 1935 municipal elections, though not in either the presidential or congressional elections. As a result of this differentiation, two separate registries were created: The General Male Register, for men older than 21; and the Municipal Register, for women older than 21.[4] Both groups had to vote in different ballot booths and their votes were counted separately (Carrera and Ulloa, 2006).

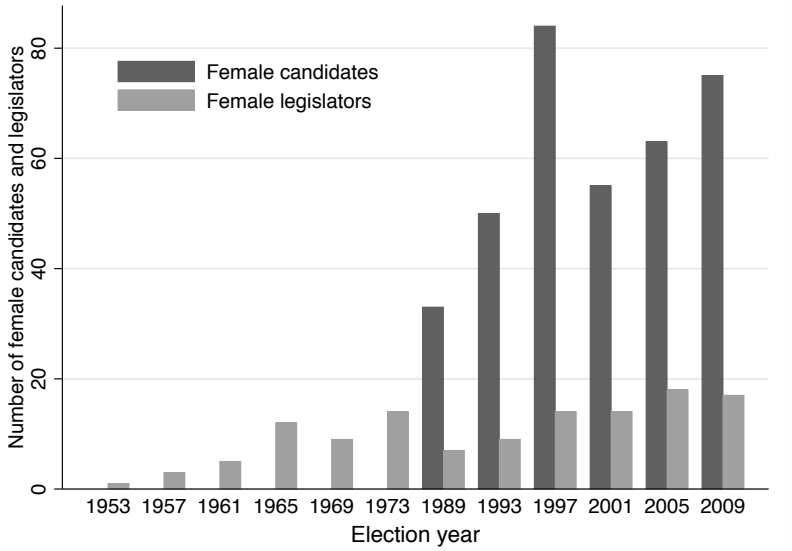
Eighteen years later in 1949, when women were allowed to vote in presidential, congressional, as well as municipal elections, the separate registers for men and women continued to be maintained. Lewis (2004, p. 720) argues that segregated polling was kept "in order to allow women more freedom to vote according to their preferences". During the dictatorship (1973–1990) the voting registers were destroyed (Garretón, 2004; Huneeus, 2016). When registers where reopened for the plebiscite in 1987, the authorities decided to keep the gender-segregated registers, as well as the gender-segregated polling stations.[5]

[4]The Municipal Register also included (men and women) foreigners.

[5]The initial bill proposed mixed-gender registers. However, it was later decided to preserve the tradition of separate registries, because that would ensure a peaceful development of the voting process, since it would

By the 1969 election women constituted almost half of the electorate. Figure 1 shows that the number of congresswomen increased gradually, from 1 out of 147 legislators in 1953, to 14 out of 150 in 1973. Since 1989 both the number of candidates and of elected congresswomen have shown an upward trend, though the number of elected women now seems to be stalled at a sixth of the seats (20 out of 120).

Figure 1: Number of female candidates and elected members, lower house.



Notes: Figure shows the number of female candidates and elected members for the lower house. There were no congressional elections between 1973 and 1989. The total number of seats was 147 between 1953 and 1965, 150 between 1969 and 1973, and 120 between 1989 and 2009. Data on the number of female candidates is available only after 1989.

2.2 The binominal system

The Chilean National Congress consists of two chambers: The *Senado* (Senate or Upper Chamber) and the *Cámara de Diputados* (Chamber of Deputies or Lower Chamber). The former has 36 members that represent 18 two-member Senate districts while the latter has 120 members representing 60 two-member congressional districts. Candidates running for these offices are presented by coalitions, which are nationwide conglomerates of parties running on

require gender-segregated polling stations (Biblioteca del Congreso Nacional de Chile, 1986).

a common policy platform. A coalition cannot present more than 2 candidates per district.[6] Each list is open, so voters can cast their vote directly for their preferred candidate (they can only vote for 1 candidate).

The two winners in each district are determined by the D'Hondt method, which stimulates most of the political competition to occur *within coalitions* rather than *across coalitions*.[7] In this method, the first seat always goes to the coalition with the largest share of votes (and within this coalition, to the candidate receiving the most votes). Typically, the second seat goes to the coalition with the next highest number of votes, and within this coalition the seat goes to the candidate with more votes. The only exception is in cases where the coalition with the most votes receives more than twice as many votes as any other coalition; in this situation, the coalition with the most votes receives both seats.[8] Since this case is unusual and difficult to obtain (roughly 12% of elections end up in a "doubling"), candidates in the two largest coalitions are forced to compete against their coalition "partner" instead of competing against candidates of other coalitions.[9] This feature allows me to analyze gender bias for each coalition independently, abstracting from ideology considerations.[10] Therefore in some specifications the sample will be restricted to one of the two main coalitions: Center-left (*Concertación*) and Center-right (*Alianza*). These are the two largest coalitions and its party members have remained unchanged in most of the elections since 1989.[11]

An additional feature of the Chilean system is that during the period of analysis voting was mandatory for registered voters, which makes selective turnout less of a concern.[12]

[6] Independent candidates can either join a coalition (in which case their party name is displayed as "Independent") or they can run as completely independent. Figure B-1 in Online Appendix B shows a ballot with an example of the former, in which candidate No. 21 is running as an independent within coalition B.

[7] Accusations of banners being destroyed by the coalition "partner" abound in congressional elections.

[8] Table B-1 in Online Appendix B shows a set of examples to illustrate all possible election outcomes.

[9] Siavelis (2002) argues that party leaders seek to avoid intralist confrontation by pairing candidates who will not engage in it. However, accounts of disputes between candidates of the same coalition, including fights among supporters and the destruction of the other candidate's posters, abound in the media.

[10] Alemán and Saiegh (2007) analyze the voting behavior of Chilean legislators in years 1997–2000, and find that the median policy position of legislators in a party is indistinguishable from the median of the coalition to which the party belongs.

[11] These two coalitions always present candidates in all districts, as opposed to smaller coalitions.

[12] Cerda and Vergara (2009) analyze voters' turnout in Chile using both aggregate and individual data, and conclude that the observed decline in turnout is mainly due to low participation of the youth. This in turn is due to under-registration of this group (registration is voluntary, though voting is mandatory once one has

Previous research using data from the Chilean elections has focused mainly on the innate bias of the electoral system towards the second-largest coalition. To the best of my knowledge, there are only two papers that take advantage of the segregated voting system in Chile. Lewis (2004) uses aggregate data from the Chilean presidential elections in 1952-1999 to analyze the political gender gap (i.e. the relative support of men and women for the left); it documented women's bias towards conservatism. Carrera and Ulloa (2006) use data from the Chilean municipal elections in 1992-2004 to show that this bias decreased in more recent elections.

3 Data

This unique dataset comes from various sources. In this section I describe the data gathering process, and present summary statistics of the variables used in the analysis.

3.1 Votes by gender

Voting data for the Chamber of Deputies at the ballot booth level was obtained from the *Tribunal Calificador de Elecciones* (Election Qualifying Court). Since controls are available at the municipality level (see below), I aggregate voting data coming from ballot booths of the same gender, within a municipality.[13] The data contain the total number of votes per candidate in each of the 6 congressional elections held every 4 years since 1989. They also include an identifier for whether the ballot booth is a male or female one.

3.2 Candidates' characteristics

The determination of candidate gender was done manually. Fortunately, names in Spanish are easy to classify across genders. Ambiguous cases were looked for in the website of the *Servicio Electoral* (Electoral Service). Panel A of Table 1 shows the summary statistics for the Chamber of Deputies' elections. On average a district has 6.78 candidates, slightly increasing

registered), and not due to a lower level of participation once registered to vote. A new change to the electoral law enacted in 2012 established voluntary voting and automatic registration.

[13] A district can contain between 1 and 15 municipalities, with an average of 6.

from 6.98 in 1989 to 7.15 in 2009. The average number of 1 female candidate per district masks significant variation across years, with 0.55 female candidates in 1989 to 1.22 in 2009. Regarding the two largest coalitions (Center-left and Center-right) they have on average one female candidate in every five districts, increasing from less than one in every 7 districts to more than one in every 4 districts. The average voteshare for women candidates is 12% on average, but it increases to about 50% when they run in one of the two largest coalitions, showing that female candidates are competitive when running for either the Center-left or Center-right.[14]

Table 1: Summary statistics: districts and candidates.

Election year	1989	1993	1997	2001	2005	2009	Average
Panel A. Districts							
No. candidates	6.98	6.40	7.37	6.35	6.43	7.15	6.78
No. female candidates	0.55	0.83	1.40	0.92	1.05	1.22	0.99
From Center-left	0.12	0.18	0.25	0.23	0.33	0.28	0.23
From Center-right	0.15	0.13	0.20	0.23	0.25	0.27	0.21
Voteshare female candidates	0.12	0.12	0.08	0.14	0.16	0.14	0.12
Within Center-left	0.49	0.54	0.49	0.58	0.53	0.48	0.52
Within Center-right	0.44	0.47	0.37	0.53	0.49	0.53	0.48
Panel B. Candidates							
Age (males)	45.99	45.99	45.63	47.98	48.62	48.08	47.01
Age (females)	46.42	44.18	42.01	45.24	46.56	46.70	44.97
Incumbent (males)	0.00	0.25	0.22	0.25	0.25	0.21	0.19
Incumbent (females)	0.00	0.08	0.06	0.20	0.19	0.21	0.13

Notes: Panel A: Sample size is 360 (6 election years and 60 districts). All numbers are district averages. Panel B: Sample size is 2,441. Age is in years, and incumbent= 1 if the candidate was elected in the same district he/she is currently running.

Few information is available for both elected and non-elected candidates. The candidates' age was obtained from the *Servicio Electoral*. In addition, I construct the dummy variable *incumbent*, which takes the value of 1 if the candidate was currently in office and running for a subsequent term in the same district. Panel B of Table 1 shows statistics for these controls. On average male candidates are 2 years older than female candidates. 19% of male candidates

[14]The only exception is year 1997, in which female candidates of the Center-right received on average 37% of the vote in the coalition.

are incumbent, compared to 13% of female candidates.

3.3 Demographic Data

I construct socio-demographic controls at the municipality level, which is a finer level of detail than electoral district level. Average age, education, share of urban and indigenous population, income, labor force participation (LFP), LFP gap (defined as the difference between male LFP and female LFP), share of women in the municipality and share of married population are constructed using the *Encuesta CASEN* (Survey of National Socio-economic Characterization), a nationally representative survey (see the Online Appendix C for details and summary statistics).

4 Empirical framework

4.1 Specification

The goal is to analyze whether there is gender bias among voters, and in particular, whether women vote more often for female candidates than do men. Let SV_{ibmt} be the share of votes to candidate i in b-type ballots ($b \in \{female, male\}$) in municipality m and in election t (I drop the sub-index t hereafter for simplicity). This vote-share is computed at the gender-municipality level as follows:

$$SV_{ibm} = \frac{V_{ibm}}{\sum_i V_{ibm}} \tag{1}$$

where V_{ibm} is the number of votes that candidate i gets. Now define ΔSV_{im} as the difference in the vote-share between female voters and male voters:

$$\Delta SV_{im} = SV_{i,b=female,m} - SV_{i,b=male,m} \tag{2}$$

I therefore consider the following specification:

$$\Delta SV_{im}^{F} = \beta + X_m\,\gamma + Z_i\,\lambda + \eta_t + \mu_d + \epsilon_{im} \tag{3}$$

where X_{mt} are municipality controls and Z_{it} are candidate controls (age and incumbency). η_t and μ_d are election year and district dummies, respectively. The supra-index F in the dependent variable indicates that the model is estimated for the subsample of female candidates. In addition, all controls are demeaned, and therefore the estimate for the constant term $\hat{\beta}$ gives the average gender bias between female and male voters, which does not change once controls are included. This is useful since it allows me to directly compare the average gender bias across the different samples analyzed in the next section.[15]

Equation (3) is estimated including candidates from all coalitions. I redefine the dependent variable to estimate the model for each coalition separately. Specifically, I restrict the denominator in equation (1) to candidates in the same coalition and re-compute ΔSV^{F}. I present the results for the center-left (Concertación) and center-right (Alianza) coalitions, since as mentioned before, these are the two largest coalitions which have remained relatively constant over time, as opposed to smaller left and right coalitions which sometimes run together but split afterwards.

4.2 Identification

The main identification strategy considers all congressional elections. Given that the focus of this paper is on the constant term $\hat{\beta}$ of equation (3), identification is straightforward since the constant term does not suffer from omitted variable bias. Nonetheless, women do not run in all districts, and even if they do, the sorting of female candidates into districts is likely to be non-random. In particular, this sorting can be due to unobservable characteristics of the candidate that in turn correlate with her relative support among men and women voters. If

[15] The specification shown in equation (3) gives identical results to regressing the share of votes computed as in equation (1), on a dummy variable taking the value of 1 when the votes come from a female ballot booth (FEMALE): $SV_{ibm} = \tilde{\alpha} + \tilde{\beta}\,\text{FEMALE}_{ibm} + \text{FEMALE}_{ibm} \times (X_m\,\tilde{\gamma} + Z_i\,\tilde{\lambda} + \eta_t + \mu_d) + \epsilon_{ibm}$. The estimate for $\tilde{\beta}$ is identical to the one for β.

this is the case, $\hat{\beta}$ will not be informative of the average relative support of female candidates. In addition, party leaders might be less inclined to choose competitive female candidates in some districts if they have a preference for male candidates and the likelihood of getting only one seat is high.

To alleviate these concerns, I re-estimate equation (3) restricting the sample of female candidates to those who face close elections within a coalition, i.e. that win or lose by a small margin against her coalition partner.[16] In these elections, winners and losers should exhibit similar characteristics. This argument has been used extensively when implementing Regression Discontinuity designs, and in particular when comparing mixed-gender races (e.g. Gagliarducci and Paserman, 2012; Ferreira and Gyourko, 2014; Brollo and Troiano, 2016).[17]

To provide further support for this argument, in the Online Appendix D I analyze whether age and incumbency of male and female candidates differ when focusing on candidates running in close elections. Age and incumbency are the only covariates available for all candidates and all elections. An imbalance on incumbency, however, can be thought as a proxy for imbalances on other characteristics.[18] Table D-1 in the Online Appendix shows no evidence of systematic differences, particularly on elections with a margin of victory below 10 percent.[19] Given that this procedure significantly reduces the sample size, its outcome should be regarded as a robustness exercise.

[16] As mentioned previously, the binominal system forces competition to occur within coalitions rather than across coalitions. Another type of close election occurs when the largest coalition has nearly double the votes of the second largest coalition (Pino, 2011). Competition among candidates of the same coalition in this case, however, need not be close.

[17] Both Gagliarducci and Paserman (2012) and Brollo and Troiano (2016) note that most of the candidates' observable characteristics converge in close elections, even those that appear unbalanced for the average sample. See Eggers, Fowler, Hainmueller, Hall and Snyder Jr (2015) for a discussion on the validity of this argument.

[18] Eggers *et al.* (2015) show that incumbency can account for most of the imbalance in U.S. House elections found by Caughey and Sekhon (2011).

[19] Notice that standard validity tests employed in the RD literature (Imbens and Lemieux, 2008) are not useful in this case, since rather than comparing outcomes of male and female candidates at either side of the threshold (and therefore only of those elected), the focus here is on comparing outcomes of winning and losing female candidates.

5 Gender bias for female candidates

5.1 All elections

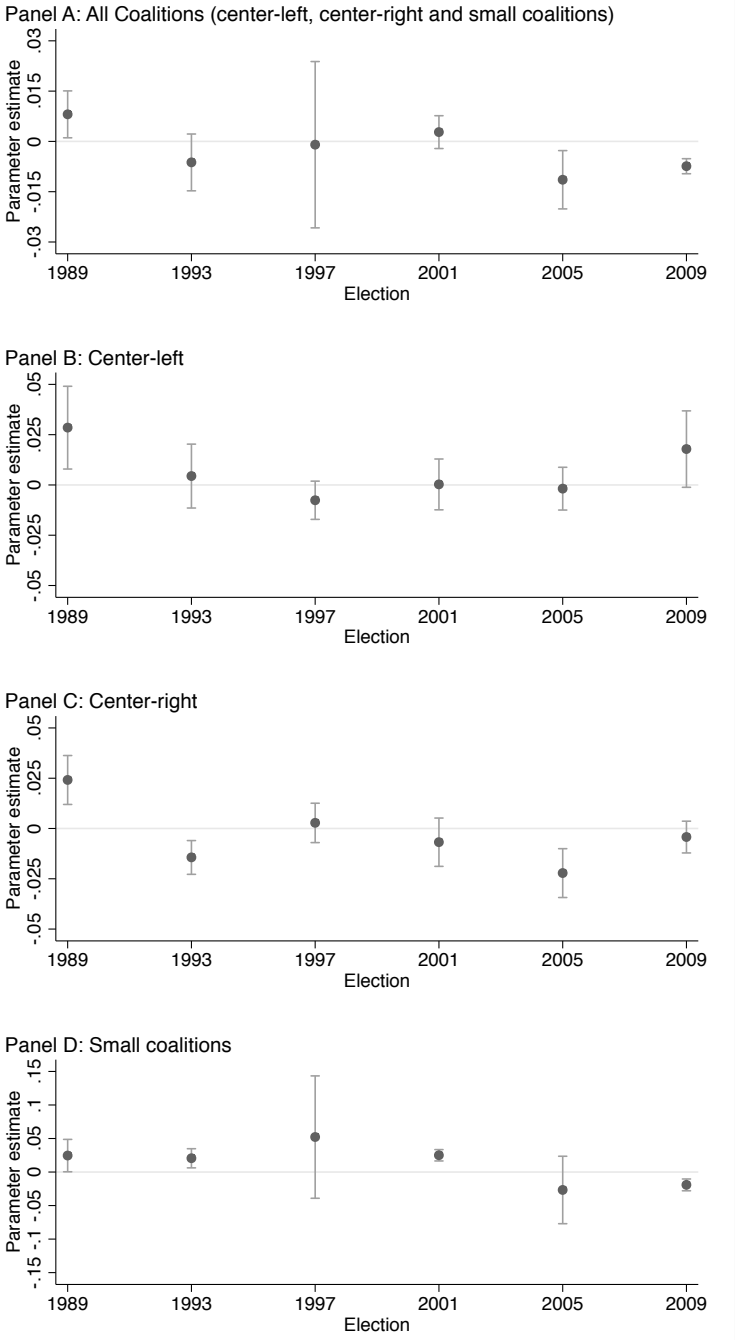
I start with a graphical representation of the results. Figure 2 shows the average gender bias for female candidates for each election in 1989-2009. The figure plots estimates of the coefficients η_t when none of the other regressors in equation (3) are included. A larger support for female candidates from women voters than from men voters corresponds to a positive coefficient.

Panel A shows the estimates when all coalitions are included. Of the six elections considered, only the first one in 1989 displays a positive and statistically significant gender bias. In the next three elections (1993, 1997 and 2001) the bias is not significantly different from zero. Finally, the estimated gender bias for the 2005 and 2009 elections is negative and statistically significant at conventional levels.

As explained before, the binominal system induces most of the electoral competition to occur within coalitions (as opposed to across coalitions). Recall that coalitions can put up at most two candidates per district, and they usually do. Therefore I now estimate equation (3) but redefining the dependent variable so that the share of votes for female candidates ΔSV^F is computed at the gender-coalition-municipality level. Panels B and C show the average gender bias for the main two coalitions: center-left (*Concertación*) and center-right (*Alianza*). These are the two largest coalitions and its party members have remained unchanged in most of the elections since 1989. Both coalitions display a positive gender bias in the 1989 election. Nonetheless, while the bias is not significantly different from zero for the center-left in the following elections, it is negative for the center-right in the 1993 and 2005 elections. Except for the 1989 election —which was the first election after the end of the dictatorship, and the first where the binominal system was in place— there is no evidence of a positive gender bias towards center-right female candidates. For completeness I also show the average gender bias for small coalitions in Panel D.[20] The four first elections feature a positive gender bias (though

[20]Notice that here ΔSV^F is computed taking into account all female candidates from small coalitions. Therefore, panels B, C and D are not an exact decomposition of Panel A.

Figure 2: Gender bias for female candidates, 1989-2009.



Notes: The figures show the estimated coefficients of regressing ΔSV^F on election dummies. Panel A includes all coalitions, while panels B and C include only the center-left and center-right coalitions, respectively. Error bars are $\pm$ 95% confidence intervals.

not statistically significant in 1997), to latter become negative and significant in 2009.

To further analyze the gender bias for female candidates, Table 2 presents regression results for all elections since 1989. The first two columns present the coefficients from estimating equation (3) including all coalitions in the sample. I add district dummies in the second column to exploit changes across municipalities while keeping district-level characteristics —such as the number of candidates on the ballot— constant.[21] The dependent variable is ΔSV^F, i.e. the difference between the vote-share that a female candidate obtains from female and male voters. The average gender bias, measured by the constant term and presented at the top of the table, is -0.3 percent, and it is significant at the 1 percent level. This means that on average female candidates get 0.3 percent less votes in female voting booths than in male voting booths. That is, they get 0.3 percent less votes coming from female voters, compared to male voters.

Columns 3 and 4 show that the gender bias for center-left female candidates is positive and statistically significant when district dummies are included (column 4). On average female candidates on the center-left get 0.5 percent more votes from women than from men voters. On the other hand, columns 5 and 6 show a negative and statistically significant gender bias for center-right female candidates. Female candidates on the center-right get 0.6 percent less votes from women than from men voters.

The table also shows how candidates and municipality characteristics affect gender bias —a positive effect on the gender bias is given by a positive coefficient. Few of the controls have a significant effect on gender bias, particularly when district dummies are included. For instance, women voters are more supportive than men of center-left female candidates in municipalities with higher income, lower average labor force participation (LFP), as well as lower LFP gap (column 3), but these effects become non-significant when exploiting the within-district variation (column 4). From the results in column 4, women voters are less likely than men to vote for female candidates in municipalities with higher education (a 1

[21] Since districts are formed by neighboring municipalities, the variance of the controls drops significantly. There is also evidence that districts were gerrymandered to increase the representation of the right (Rahat and Sznajder, 1998).

Table 2: Determinants of gender bias for female candidates

Dep. Variable:	ΔSV^F (Difference in vote-shares to female candidates)					
Sample:	All		Center-left		Center-right	
	(1)	(2)	(3)	(4)	(5)	(6)
Average gender bias	-0.003***	-0.003***	0.005	0.005***	-0.006*	-0.006***
	(0.001)	(0.000)	(0.005)	(0.000)	(0.003)	(0.000)
Candidate age	0.000	0.001	0.006	0.013	0.000	-0.003
	(0.001)	(0.001)	(0.004)	(0.010)	(0.003)	(0.005)
Candidate incumbent	-0.004	-0.003	-0.014	-0.006	0.012*	0.026*
	(0.004)	(0.004)	(0.009)	(0.012)	(0.006)	(0.015)
Age	0.020	-0.007	-0.029	-0.044	0.053	-0.063
	(0.027)	(0.026)	(0.093)	(0.086)	(0.067)	(0.055)
Age^2	-0.000	0.000	-0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education	-0.008	0.004	-0.093	-0.059*	-0.068	0.008
	(0.018)	(0.016)	(0.076)	(0.031)	(0.053)	(0.051)
Urban	0.237	-0.269	1.608	0.216	-0.227	-2.465*
	(0.436)	(0.302)	(2.161)	(1.453)	(1.358)	(1.449)
Income	0.002	0.000	0.020*	0.006	0.002	-0.004
	(0.003)	(0.002)	(0.011)	(0.006)	(0.011)	(0.013)
$Income^2$	-0.000	0.000	-0.001*	-0.000	0.000	0.001
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)
LFP	-1.858	-0.928	-13.608**	-8.267	-0.087	-7.115
	(1.163)	(1.491)	(6.474)	(7.615)	(6.615)	(6.812)
LFP gap	-0.824	0.552	-10.859**	-3.070	-3.254	-4.123
	(0.806)	(0.779)	(5.019)	(2.969)	(3.442)	(3.162)
Sex ratio	3.191	3.644	-8.077	-0.499	7.803	4.150
	(3.030)	(2.687)	(12.331)	(10.851)	(11.525)	(13.489)
Married	-1.206	-1.437	-5.896	-4.149	-8.319	-7.394
	(1.620)	(1.363)	(5.411)	(4.683)	(6.067)	(5.471)
Log(Population)	-0.000	0.000	-0.003	-0.002	0.003	0.002
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)
District dummies	no	yes	no	yes	no	yes
Observations	1699	1699	389	389	306	306
R-squared	0.157	0.260	0.076	0.240	0.212	0.472

Notes: The table reports municipality-level regressions for elections where at least one candidate in the district (columns 1–2) or in the coalition (columns 3–6) is female. Robust standard errors are reported in parentheses, adjusted for clustering at the district level. The dependent variable ΔSV^F is defined as the difference between women and men vote-shares to female candidates. All regressions include election year dummies. All controls shown except for Candidate age and candidate incumbent, are municipality averages. All controls are centered around their sample mean. ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

standard deviation increase in age increases gender bias by 1 percent). On the other hand, female candidates running for the center-right receive more votes from women than men when they are incumbent (the negative bias turns to positive when an incumbent female candidate is running), and from women that live in municipalities with less urban population (an decrease of 1 standard deviation in the share of urban population increases the gender bias in 0.8 percent). None of the other controls explains the observed gender biases with statistical significance at conventional levels.

How large are these biases? Compared to the average margin of victory in center-right and center-left races where a female candidate competes (31 and 44 percent, respectively), gender biases are small. There are, however, two caveats. First, margins of victory and gender biases are not directly comparable. The former measures the difference in the share of votes of two candidates, taking into account both female and male voters. The gender bias, by contrast, compares the share of votes of female and male voters for the female candidate. Therefore, large margins of victory can display a very small gender bias, and the opposite is also possible. Second, gender biases become larger (and therefore comparable in size to the average margin of victory) when I restrict the sample to close elections, as I show in the next section.

5.2 Evidence from close elections

As explained earlier, unobservable characteristics of the candidates might bias the results if they are correlated with the likelihood of a female candidate running in a district and with her relative support among men and women voters. This issue can be addressed by analyzing the gender bias in elections where the female candidate won or lost the election by a small margin. To this end, I re-estimate equation (3) restricting the sample to female candidates in elections where the margin of victory was smaller than a certain threshold (5, 10 or 15 percent of the total votes in the coalition). The exercise is performed for center-left and center-right coalitions only, since the other smaller coalitions do not put up two candidates in all districts, and therefore it is not always possible to compute the margin of victory.

Table 3 shows the results. In columns 1 and 4 the sample is restricted to elections whose margin is smaller than 5 percent of the votes for the coalition, while in columns 2 and 5 (resp. 3 and 6) the sample considers a 10 percent (resp. 15 percent) margin of victory. The main result shown in Table 2 is confirmed: Elections of center-left female candidates display a positive and statistically significant gender bias, while the opposite is true for center-right female candidates. For female candidates on the center-left, the positive gender bias ranges between 0.5 and 1.9 percent, depending on the specification. Female candidates on the center-right, on the other hand, exhibit a negative gender bias that ranges between 0.4 and 1.2 percent.

These results show that gender biases are not reduced when analyzing close elections in which competitive female candidates run. Even more so, the evidence suggests that gender biases increase in close elections. Another interesting result is that several candidates' characteristics have significant effects on the relative support of men and women voters, despite being balanced across candidates on average. For instance, incumbent female candidates on the center left receive significantly less support from female voters than male voters (columns 1 and 2). The same is true for center-right female incumbents though only in elections where the margin of victory is smaller than 15 percent. Also, older center-right candidates receive significantly less support from women voters than from men voters in very close races (columns 4 and 5); however this result reverses when races with a margin of victory of up to 15 percent are included (column 6).

The magnitude of the effects observed in Table 3 are comparable to the sample average margin of victory, displayed at the bottom of the table. The positive gender bias towards female center-left candidates ranges between 18 and 38 percent of the average margin of victory, while the negative gender bias towards female center-right candidates ranges between 8 and 41 percent of the average margin of victory, depending on the specification.

Table 3: Determinants of gender bias for female candidates, close elections

Dep. Variable:	ΔSV^F (Difference in vote-shares to female candidates)					
Sample:	Center-left			Center-right		
Margin of victory:	$\leq 5\%$	$\leq 10\%$	$\leq 15\%$	$\leq 5\%$	$\leq 10\%$	$\leq 15\%$
	(1)	(2)	(3)	(4)	(5)	(6)
Average gender bias	0.005***	0.018***	0.019***	-0.012***	-0.004***	-0.012***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Candidate age	-0.001	0.011	0.045	-0.025**	-0.023***	0.004***
	(0.002)	(0.006)	(0.049)	(0.007)	(0.006)	(0.000)
Candidate incumbent	-0.042***	-0.078***	0.055		-0.003	-0.041**
	(0.004)	(0.012)	(0.054)		(0.008)	(0.014)
Age	0.372	0.477	-0.039	-0.034	0.265	-0.235
	(0.300)	(0.338)	(0.110)	(0.282)	(0.361)	(0.173)
Age^2	-0.001	-0.001	0.000	0.000	-0.000	0.000
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)
Education	-0.095	-0.040	-0.078	0.120	0.067	0.143*
	(0.054)	(0.069)	(0.057)	(0.194)	(0.044)	(0.076)
Urban	4.581	2.841	1.962	-4.413**	-10.601*	-2.859
	(2.511)	(2.139)	(1.935)	(1.346)	(4.983)	(3.312)
Income	-0.001	-0.005	0.008	-0.003	-0.031	-0.024
	(0.034)	(0.011)	(0.010)	(0.022)	(0.028)	(0.014)
$Income^2$	0.000	0.000	-0.000	-0.000	0.002	0.001
	(0.007)	(0.000)	(0.000)	(0.001)	(0.002)	(0.001)
LFP	18.764	9.926	5.892	-20.587*	-51.773*	-17.813
	(9.806)	(9.288)	(10.358)	(8.259)	(23.673)	(11.947)
LFP gap	10.775	4.009	0.748	-4.881	-16.073*	1.279
	(7.108)	(5.119)	(6.409)	(2.934)	(8.157)	(4.538)
Sex ratio	-17.802	-8.006	-4.051	5.075	-29.666**	-21.905
	(16.928)	(10.629)	(11.937)	(29.938)	(9.726)	(14.342)
Married	-12.723	-13.164	-18.138*	-18.148*	-21.519	-18.410*
	(9.590)	(10.191)	(10.436)	(7.919)	(12.840)	(9.715)
Log(Population)	-0.009	-0.008*	-0.006	-0.005	0.006	-0.008
	(0.007)	(0.005)	(0.004)	(0.016)	(0.003)	(0.008)
District dummies	yes	yes	yes	yes	yes	yes
Observations	51	88	151	22	42	79
R-squared	0.569	0.651	0.519	0.953	0.917	0.786
Average margin of victory	0.028	0.047	0.078	0.029	0.048	0.091

Notes: The table reports municipality-level regressions for elections where at least one candidate in the coalition is female, and where the margin of victory of the winning candidate is either 5, 10, or 15 percent. Robust standard errors are reported in parentheses, adjusted for clustering at the district level. The dependent variable ΔSV^F is defined as the difference between women and men vote-shares to female candidates. All regressions include the log of population and election year dummies as controls. All controls shown except for Candidate age and candidate incumbent, are municipality averages. All controls are centered around their sample mean. ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

6 Intrinsic preferences or gender differences on policy?

The results in the previous section show that women do not always prefer the female candidate over the male candidate, neither in elections at large, nor when elections are close and thus candidates' characteristics other than gender are comparable. In this section I discuss possible explanations that could be driving these results.

6.1 Gender identity

One possibility is that the gender of the candidate not only signals the candidate's preferred policy platform, but also has an effect on voters' behavior which may depend on voters' identity. Akerlof and Kranton (2000) postulate that social categories, such as "man" and "woman", are associated with physical attributes and prescribed behaviors. From these prescribed behaviors individuals form their identity as a man or as a woman. Acting in a way that differs from these behaviors generates discomfort (i.e. a negative payoff) in oneself and others. In this context, women supporters of a more conservative party, such as the ones in the center-right coalition, could have conservative views of a woman's identity. They might feel their identity threatened when a female candidate runs for office (which they see as outside appropriate behaviors for a woman), and may therefore refrain from voting for her to validate or preserve the social norm. Gender identity can therefore explain why women vote less often for female center-right candidates than men do.[22]

The regressions shown in the previous section include the Labor Force Participation (LFP) gap as a regressor. This variable should be a good predictor of the prevalence of traditional gender roles.[23] The evidence from Table 2 shows that female candidates from both center-

[22]Men might also feel their identity of "breadwinners" threatened when a female candidate runs for office. Therefore an additional condition is that the gender identity effect must be larger for women than men.

[23]The LFP gap seems to be a good measure of what both men **and** women think their roles should be. Evidence to support this argument comes from Booth and Van Ours (2009), who analyze the relationship between full- and part-time work and family wellbeing. They find that women part-time workers are more satisfied with working hours than full-time women, but that their satisfaction increases if their partners work full-time. On the other hand, male's satisfaction is unaffected by their partners work decision but it increases if they themselves work full-time. This can be regarded as evidence consistent with the gender identity hypothesis, and generates a prediction for the LFP gap (once one has controlled for the average level of LFP).

left and center-right coalitions receive less votes from women voters than from men voters in municipalities with a larger LFP gap. However, the estimate is only significant in column 3, for the center-left and when district dummies are not included. Indeed, the point estimate is reduced to a third when district dummies are included (column 4), and it is no longer significant at conventional levels. The results for close elections (Table 3) are more auspicious, with the coefficient for LFP gap being negative and significant at 10 percent for elections in which the center-right coalition won by a margin of less than 10 percent (column 5). The effect is sizeable: One standard deviation increase in the LFP gap can reduce the votes to female candidates coming from women voters by 2.7 percent, compared to the votes received from men. The effect is still negative but less precisely estimated when the sample is restricted to elections won with a 5 percent margin (column 4), but it disappears when the margin of victory is increased to 15 percent (column 6).

Marriage can also be thought as a proxy for gender identity, since being married involves certain prescriptions, such as the husband having to earn more than the wife (Watson and Mclanahan, 2011; Bertrand, Kamenica and Pan, 2015). The coefficient on the dummy variable Married is negative and significant at 10 percent in columns 4 and 6, indicating that center-right women living in municipalities with a larger share of married voters are less likely to vote for the female candidate than men. In column 5 the point estimate is negative but not significant at conventional levels.

Overall there is some, though not very robust, evidence of gender identity having an effect on the support for female candidates, particularly in close elections. It is possible that the LFP gap does not capture the complexity of gender identity. It might also be the case that men voters feel that their identity as breadwinners is also threatened when a female candidate runs for office and therefore, even though it imperfectly measures traditional gender roles, the LFP gap decreases both men and women voters' likelihood of voting for a female candidate.

6.2 Legislators' Behavior

Do the findings in the previous section reflect the fact that female legislators do not differentiate themselves from their male counterparts by, for instance, not supporting different bills, or by supporting bills that are not preferred by the female electorate? To investigate this possibility I collected roll-call voting data from the Chamber of Deputies to test whether female legislators vote differently from their male counterparts. I describe the data and present summary statistics in Online Appendix C.

I look at the likelihood that a legislator voted differently from the majority of her coalition.[24] To identify those bills where it is relevant to cast a vote in opposition to the coalition I restrict the sample to include only *party unity votes*, in which the majority of the center-left coalition voted differently from the majority of the center-right coalition.[25] This leads to the following specification:

$$DIF_{iv} = \alpha + \beta\, FEMALE_i + X_i\gamma + W_v\theta + \epsilon_{iv}. \tag{4}$$

The dependent variable DIF is a dummy for whether the legislator i voted differently from the majority of her/his coalition in vote v. The dummy FEMALE takes the value of 1 for female legislators. X_i is a vector of legislators' characteristics (a dummy senior that takes the value of 1 for legislators in their second term and above, age and age squared), and W_v is a vector of controls at the vote level: a set of dummies for the primary issue of the bill, and a set of dummies with the required quorum of the bill.[26] I estimate a linear probability model and cluster standard errors at the candidate level.

Panel A of Table 4 shows the results when all bills are included, irrespective of their

[24] A similar strategy was used in Rehavi (2007) to analyze roll-call data from U.S. State Assemblies. Previous papers analyzing the voting behavior of U.S. congressmen relied on voting scores for "pro-female" legislation, or analyzed a subset of bills with a clear position on a particular issue (e.g. Lee, Moretti and Butler, 2004; Washington, 2008). This information is not available for bills discussed in the Chilean Congress.

[25] This is a well established measure of discrepancy between parties. The term was introduced by Congressional Quarterly (CQ), a company that produces reports of roll-call voting statistics.

[26] Special quorums are required when a constitutional amendment is proposed, but also for particular laws specified in the constitution which require a special quorum (Leyes Orgánicas Constitucionales). The proportion of votes that require a special quorum in my sample is only 4%.

primary issue. In Panels B and C I report estimates for FEMALE when the sample is restricted to a single issue. Of particular interest are the results concerning bills where a "women's issue" was the primary issue. These results are reported in Panel B. I consider as women's issues education, government, justice, health, labor and family.[27] Finally, Panel C reports results when the sample of bills is restricted to other issues. Columns 1-4 show results for the center-left coalition, while 5-8 show results for the center-right. Columns 1 and 5 show the main results, including bills from 3 consecutive legislative periods.[28] The other columns split the sample into separate legislative periods.

The results for the sample with all issues (Panel A) shows no evidence of female legislators voting different from the majority of their coalition more or less often than their male counterparts. The point estimates are suggestive of center-left female legislators voting more often than male legislators with the majority of their coalition, while the opposite is true for center-right female legislators. Standard errors, however, are large in all specifications.

A slightly different picture arises in Panel B, when I estimate equation (4) for each women's issue separately. When all years are included (column 1), Center-left female legislators are significantly less likely than males to vote different from the majority of their coalition in 3 of 6 issues (government, justice and family). These effects are economically significant: when voting on family issues, female legislators from the center-left are 4.8 percentage points less likely than males to vote different from the coalition. Given that the average legislator from the center-left votes different from his/her coalition on this issue in 8.2 percent of the votes, center-left women vote different 56 percent less often.

[27] There is a long literature discussing the definition of women's issues. I adopt the definition of Volden, Wiseman and Wittmer (2013), who determine women's issues as those where a larger proportion of women introduce bills in the U.S. House than do men. These issues are civil rights and liberties; education; health; labor, employment and migration; and law, crime and family.

[28] The first period covers 3/11/2002 to 3/11/2006, the second covers 3/11/2006 to 3/112010, and the third covers 3/11/2010 to 3/11/2014, though data only up to 9/7/2011 was collected.

Table 4: Voting different from own coalition

Dep. Variable:	Vote different from the majority of the coalition							
Coalition:	Center-left				Center-right			
Years:	2002-2011[a]	2002-2006	2006-2010	2010-2011[a]	2002-2011[a]	2002-2006	2006-2010	2010-2011[a]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: All issues				
Female	-0.017	-0.011	-0.016	-0.039	0.028	0.067	-0.020	0.009
	(0.017)	(0.010)	(0.013)	(0.057)	(0.030)	(0.071)	(0.026)	(0.012)
Observations	84769	30831	37010	16928	71500	26646	29840	15014
R-squared	0.039	0.046	0.035	0.018	0.040	0.050	0.047	0.035
				Panel B: By issue: women's issues				
Education	-0.015	-0.014**	0.004	-0.047	0.023	0.082	-0.040	0.012
	(0.024)	(0.006)	(0.037)	(0.064)	(0.036)	(0.091)	(0.047)	(0.010)
Observations	17680	4941	7568	5171	15762	4434	6670	4658
R-squared	0.134	0.046	0.191	0.028	0.059	0.032	0.072	0.006
Government	-0.019*	-0.014*	-0.030	-0.009	0.032	0.077	-0.080	-0.038**
	(0.011)	(0.008)	(0.020)	(0.063)	(0.052)	(0.085)	(0.051)	(0.017)
Observations	7993	4629	2646	718	7039	4191	2226	622
R-squared	0.132	0.166	0.059	0.058	0.042	0.030	0.043	0.127
Justice	-0.038***	-0.006	-0.042***	-0.105**	0.061	0.160	-0.010	0.005
	(0.014)	(0.012)	(0.012)	(0.052)	(0.053)	(0.133)	(0.033)	(0.007)
Observations	10350	3854	4230	2266	8467	3095	3362	2010
R-squared	0.073	0.085	0.010	0.084	0.084	0.034	0.072	0.003
Health	-0.037	-0.006	-0.076***	-0.131*	0.086**	0.065	0.085	0.076
	(0.038)	(0.050)	(0.029)	(0.066)	(0.040)	(0.054)	(0.073)	(0.072)
Observations	4946	3313	989	644	4241	2836	834	571
R-squared	0.137	0.188	0.046	0.196	0.075	0.059	0.099	0.070
Labor	0.015	-0.003	-0.002	0.062	0.023	0.023	-0.006	0.079***
	(0.018)	(0.019)	(0.007)	(0.056)	(0.020)	(0.047)	(0.024)	(0.018)
Observations	2992	746	1447	799	2497	633	1191	673
R-squared	0.102	0.170	0.019	0.019	0.145	0.521	0.131	0.035
Family	-0.048**	-0.039**	-0.027	-0.174*	0.075	0.043	0.163**	-0.054
	(0.019)	(0.019)	(0.023)	(0.089)	(0.109)	(0.150)	(0.068)	(0.037)
Observations	2097	1543	359	195	1753	1287	283	183
R-squared	0.038	0.041	0.052	0.035	0.145	0.166	0.123	0.012

Table 4: Voting different from own coalition (continued)

Dep. Variable:	Vote different from the majority of the coalition							
Coalition:	Center-left				Center-right			
Years:	2002-2011[a]	2002-2006	2006-2010	2010-2011[a]	2002-2011[a]	2002-2006	2006-2010	2010-2011[a]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel C: By issue: other issues								
Agriculture	-0.004	-0.010	0.009	-0.028	0.014	0.080	-0.035	-0.031
	(0.017)	(0.025)	(0.025)	(0.045)	(0.045)	(0.124)	(0.057)	(0.021)
Observations	4856	1560	1977	1319	4221	1416	1638	1167
R-squared	0.056	0.047	0.103	0.012	0.056	0.057	0.061	0.060
Defense	-0.016	-0.019	-0.032	0.102	0.030	0.027	0.058	
	(0.014)	(0.013)	(0.057)	(0.144)	(0.025)	(0.028)	(0.052)	
Observations	1994	1639	233	122	1696	1415	187	
R-squared	0.129	0.071	0.015	0.061	0.026	0.025	0.089	
Finance	-0.014	-0.009	-0.013	-0.026	-0.006	0.009	-0.022**	0.007
	(0.030)	(0.007)	(0.027)	(0.074)	(0.009)	(0.029)	(0.010)	(0.014)
Observations	22796	4990	12788	5018	18522	4291	9789	4442
R-squared	0.028	0.005	0.023	0.004	0.020	0.022	0.017	0.006
Mining	-0.016	-0.026***	-0.004	-0.073	0.035	-0.001	-0.012	
	(0.015)	(0.009)	(0.029)	(0.107)	(0.052)	(0.069)	(0.071)	
Observations	3440	1871	1405	164	2903	1673	1079	
R-squared	0.076	0.061	0.018	0.063	0.095	0.112	0.086	
Public Works	0.004	0.009	-0.011	0.020	0.038	0.058	0.011	0.054
	(0.020)	(0.030)	(0.029)	(0.074)	(0.026)	(0.059)	(0.017)	(0.078)
Observations	3724	1020	2192	512	3119	933	1743	443
R-squared	0.057	0.034	0.072	0.039	0.105	0.203	0.032	0.062
Foreign Relations	-0.012	0.025	-0.039**		0.085*	0.098*	0.040	
	(0.013)	(0.033)	(0.015)		(0.046)	(0.052)	(0.050)	
Observations	1901	725	1176		1280	442	838	
R-squared	0.063	0.056	0.081		0.135	0.275	0.137	

Notes: The table reports estimates of equation (4). Columns 1-4 show regression results for the Center-left coalition, while columns 5-8 show the corresponding results for the Center-right coalition. Panel A presents estimates of the coefficient FEMALE when bills of all issues are in the sample. Panel B restricts the sample to a single issue. Robust standard errors are in parentheses, adjusted for clustering at the legislator level. Covariates include seniority, candidate age, quorum and year dummies. ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively. [a] Data up to 9/7/2011.

There are no significant differences in education and health for the whole sample, but in the 2002-2006 congress (column 2) center-left female legislators were 1.4 percentage points less likely than men to vote different from the coalition on bills were education was the primary issue. The figure for the 2006-2010 congress (column 3) is 7.6 percentage points when looking at health bills. This evidence suggests that female legislators from the Center-left coalition are more likely to vote with the majority of their coalition than their male peers on women's issues. This is not surprising, since the center-left coalition has been traditionally more supportive of women's issues.

Center-right female legislators, on the other hand, show no significant differences with their male peers. Results when all years are included (column 5) show that only in health bills female legislators are 8.6 percentage points more likely to vote different from their male fellow legislators. There is also some evidence of center-right female legislators voting different from their coalition more often than men on family bills during the 2006-2010 congress (column 7) and on labor bills during the 2010-2014 congress (column 8). However, also in the 2010-2014 congress (when the center-right was in power) female legislators were less likely to vote different from their coalition on government bills. This result contrasts with the work of Swers (1998), who finds that female representatives in the U.S. Congress deviate more from the party line than their male counterparts, particularly on women's issues.

Finally, Panel C shows no significant differences between female and male legislators when voting on other issues. The only exception is foreign relations, where center-right female legislators are 8.5 percentage points more likely to vote different from their coalition than men. Overall, these results show that center-right female legislators do not differentiate themselves from male legislators when voting on women's issues.

7 Conclusion

Recent literature has stressed the importance of leaders, in particular female leaders, to economic outcomes. The gender of the leader can be thought of as a signal of the leader's

preferences. Therefore, if women share similar policy preferences, as a group they should show a larger support for female leaders than for male leaders. This is difficult to observe because of the secrecy of the ballot. In order to analyze women's support for female candidates, this paper makes use of a unique dataset from Chilean congressional elections where women and men vote separately.

I find that on average women vote slightly less often for female candidates than men do. This negative gender bias breaks down into a positive gender bias among center-left voters and a negative gender bias among center-right voters, both statistically significant. The results do not seem to be explained away by focusing on competitive elections; on the contrary, the biases increase in magnitude. Moreover, the analysis of the legislators' voting records provides evidence against a policy-based explanation of this gender bias.

The data presented here are consistent with a model in which female and male legislators vote alike (i.e. have similar policy platforms), but women voters living in municipalities where traditional gender roles are more prevalent have a slight preference for center-right male candidates instead of female candidates. These results underline the complexity of the process of aggregation of individual preferences.

The evidence presented in this paper does not question whether female leaders have an effect on economic outcomes, but instead challenges the mechanism through which this effect takes place. Thus, women leaders might matter not because they implement policies which are closer to female preferences, but because they perform better in other dimensions such as being less susceptible to corruption (e.g. Brollo and Troiano, 2016), or being better at negotiating for others (e.g. Bowles, Babcock and McGinn, 2005).

The paper contributes to the literature in two other aspects. First, it underlines the importance of actual voting data instead of surveys or exit polls, especially when differential response biases could be present. And second, it adds to the growing literature which finds that women do not perform better when evaluated by their gender-peers.

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ONLINE APPENDIX (NOT FOR PUBLICATION)

Is There Gender Bias Among Voters?

Evidence from the Chilean Congressional Elections

Francisco Pino

A. Gender-of-interviewer effect: Latinobarómetro Survey

In the following appendix I show, using the 2006 wave of the Latinobarómetro Survey for which the gender of the interviewer is known, that there is a gender-of-interviewer effect, and that this effect is different for male and female respondents.

The Latinobarómetro Survey is a public opinion survey covering 18 Latin American countries. The sample size for Chile is 1,200 individuals and spans over years 1995–2011, except for year 1999. The 2006 wave of the Latinobarómetro Survey includes the names of the 103 interviewers assigned to the Chilean sample. From their names I was able to identify their gender: 77 of them were female, while 25 were male.[1] Table A-1 describes the questions I have selected to analyze the existence of a gender-of-interviewer effect. These are the set of questions identified as sensitive to gender considerations and therefore most likely to display a gender-of-interviewer effect.

Table A-1: Latinobarómetro Survey, description of variables

Variable	Question	Coding
Bachelet	Evaluate Michelle Bachelet (0: very bad, 10: very good)	1 if respondent chooses 6 or above
Harassment	Have you, or someone in your family, been sexually harassed in your workplace?	1 if respondent answers yes
Violence	How do you evaluate the problem of intra household violence?	1 if respondent evaluates the problem as very important
Salary	Do you think that women are given as much opportunity as men to earn the same salary?	1 if respondent answers yes
Unprepared	Why there are not enough women in public charges? Because women are not prepared	1 if respondent selects this alternative
No-time	Why there are not enough women in public charges? Because women have no time for politics	1 if respondent selects this alternative

[1] There is one interviewer for which the firstname is not provided, and therefore it is not possible to identify the gender.

I analyze the existence of gender-of-interviewer effects by estimating the following regression:

$$\begin{aligned} y_i &= \alpha + \beta_1 \text{Female respondent}_i + \beta_2 \text{Female interviewer}_i \\ &+ \beta_3 \text{Female respondent}_i \times \text{Female interviewer}_i + X_i\gamma + \epsilon_i \end{aligned} \tag{5}$$

Female respondent$_i$ takes the value of 1 if the respondent is female, while Female interviewer$_i$ is equal to 1 if the respondent's interviewer was female. X_i is a set of respondent characteristics (age and age squared, marital status, ideology and education). I cluster standard errors at the city level.

Flores-Macias and Lawson (2008) show that the gender-of-interviewer effect can vary significantly from rural to urban settings. Since the Latinobarómetro Survey does not include a variable for urban/rural area, I divide the sample in two categories: Respondents living in large cities (above 100,000 inhabitants), and respondents living in small and medium size cities (below 100,000 inhabitants).[2]

The results of this exercise are shown in Table A-2. Panel A presents results for individuals living in large cities, while panel B shows results for individuals living in small and medium cities. Starting from panel A, column 1 shows that there is a gender-of-interviewer effect when individuals are asked to evaluate President Bachelet: While female respondents are 16.1 percentage points less likely than men to evaluate Bachelet with a score of 6 or above when they are interviewed by a man, they become 6.6 percentage points (significant at 5 percent) more likely than men to give her a good score when the same question is asked by a female interviewer. By contrast, when looking at panel B, column 1 shows no evidence of this effect.

The next columns of Table A-2 confirm the existence of the gender-of-interviewer effect, with women living in large cities and interviewed by a woman being more likely than men to evaluate intra household violence as a very important problem (column 3), and less likely

[2] 60 percent of respondents live in large cities.

Table A-2: Gender-of-interviewer effect

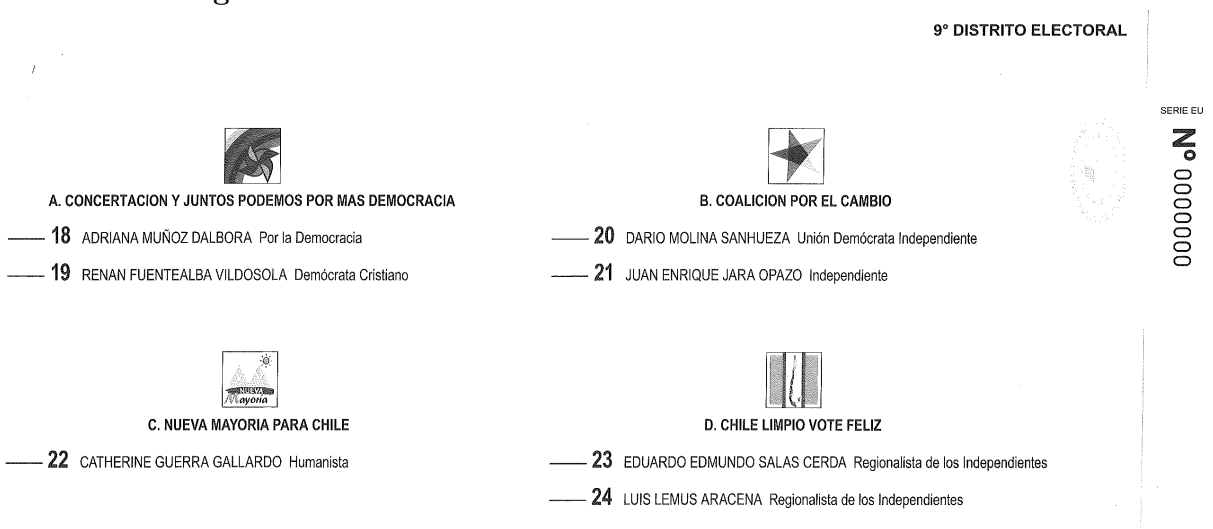
Dep. Variable:	Bachelet	Harassment	Violence	Salary	Unprepared	No-time
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: Large cities			
Female respondent	-0.161***	-0.021	-0.024	-0.055	-0.020	0.081**
	(0.040)	(0.043)	(0.023)	(0.052)	(0.037)	(0.032)
Female interviewer	-0.174**	-0.002	-0.059	0.086	-0.071	-0.068*
	(0.084)	(0.048)	(0.037)	(0.061)	(0.050)	(0.033)
Interaction	0.227***	0.051	0.070***	-0.108**	0.003	-0.067**
	(0.035)	(0.048)	(0.023)	(0.049)	(0.043)	(0.031)
R^2	0.041	0.041	0.019	0.054	0.076	0.029
Observations	692	711	713	665	699	699
			Panel B: Small and medium cities			
Female respondent	0.116	0.055*	0.133**	-0.194*	-0.008	-0.054
	(0.102)	(0.033)	(0.065)	(0.099)	(0.017)	(0.054)
Female interviewer	-0.004	0.037	0.099	0.161	0.083**	0.006
	(0.079)	(0.026)	(0.085)	(0.112)	(0.036)	(0.079)
Interaction	-0.142	-0.062*	-0.119*	0.050	-0.054*	0.020
	(0.102)	(0.032)	(0.071)	(0.109)	(0.031)	(0.061)
R^2	0.060	0.036	0.044	0.090	0.070	0.047
Observations	437	466	460	440	444	444

Notes: The table presents results of linear regressions where the dependent variable is a dummy created from questions of the Latinobarómetro Survey for Chile in 2006. Each dependent variable is defined in Table A-1. The variable *Interaction* corresponds to Female respondent × Female interviewer. All regressions include the respondent's age and age squared, marital status, ideology (location in a left-right scale of 0 to 10) and education dummies. In panel A the sample is restricted to individuals living in cities with 100,000 inhabitants or more. Panel B restricts the sample to individuals living in cities of less than 100,000 inhabitants. Robust standard errors in parentheses, adjusted for clustering at the city level. ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

than men to declare that women are given equal opportunity to earn the same salary (column 4). Also there is some evidence that women interviewed by men are more likely than men to express that women participate less in politics because they have no time, while this bias disappears when the interviewer is female (column 6).

B. Chilean Elections: the binominal system

Figure B-1: Ballot for the 9th district in the 2009 election.



Source: Chilean Electoral Service.

Table B-1: Four examples of election outcomes.

	Case 1	Case 2	Case 3	Case 4
Coalition A	40%	50%	60%	70%
Candidate A1	**30%**	**30%**	**35%**	**60%**
Candidate A2	10%	20%	**25%**	**10%**
Coalition B	40%	30%	30%	20%
Candidate B1	**22%**	**18%**	18%	18%
Candidate B2	18%	12%	12%	2%
Coalition C	20%	20%	10%	10%
Candidate C1	11%	11%	6%	6%
Candidate C2	9%	9%	4%	4%

Notes: Vote shares of elected candidates are in boldface. In cases 1 and 2 one legislator in each of the largest coalitions is elected. In case 2 coalition A "fails to double", since even though its two candidates obtain the first and second larger shares of votes, the coalition obtains less than double the votes of coalition B. In cases 3 and 4 coalition A "doubles" coalition B and gets candidates A1 and A2 elected. Case 4 is a peculiar one, since candidate B1 has a larger share of votes than candidate A2. Even though the four cases are possible, during the last 6 elections cases 1 and 2 have been the most frequent outcome with 87% of the total cases.

C. Details on data colletion

Demographic controls

The *Encuesta CASEN* is not performed every year, so I use the survey conducted the year closest to the election.[3] The survey is designed to evaluate the impact and focus of social policies, and therefore it aims at covering the entire Chilean territory. Nonetheless, even in the 2009 round there were 12 municipalities (3.5 percent of the total) that were not covered by the survey. Table C-1 shows the availability of controls by election year. I imputed the average of neighboring municipalities when they were in the same *Provincia* (Province), the next administrative unit. This procedure works for 11 municipalities in year 2009, leaving only 1 municipality without demographic controls.

Table C-1: Encuesta CASEN: availability of controls.

	Year						
Election year	1989	1993	1997	2001	2005	2009	Total
Controls at municipal level	151	244	243	304	335	334	1,611
Percent	45.07	72.84	71.05	88.89	96.82	96.53	78.74
Controls at province level	163	60	91	35	7	11	367
Percent	48.66	17.91	26.61	10.23	2.02	3.18	17.94
No controls	21	31	8	3	4	1	68
Percent	6.27	9.25	2.34	0.88	1.16	0.29	3.32
Total	335	335	342	342	346	346	2,046
Percent	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table C-2 present summary statistics for all demographic controls included in the regressions.

[3] In particular, I use rounds 1990, 1994, 1998, 2000, 2006 and 2009.

Table C-2: Demographics: summary statistics.

Election year	1989	1993	1997	2001	2005	2009
Age (years)	28.70	29.92	30.54	31.23	33.76	35.10
Education (years)	8.08	8.00	8.46	8.43	8.84	9.06
Urban (percent)	67.79	63.22	67.47	62.76	63.54	64.01
Income (10,000 pesos)	6.90	12.76	20.09	20.21	23.76	31.07
Labor Force Participation, LFP (percent)	54.13	56.69	56.19	55.98	59.16	56.22
LFP gap (percent)	62.54	61.30	54.95	54.76	49.58	48.29
Women (percent)	50.94	50.93	50.55	50.09	50.60	50.91
Married (percent)	62.83	62.89	61.75	61.53	59.12	58.72

Notes: All variables are averages constructed at the municipality level. LFP and LFP gap are computed for individuals of age between 18 and 60. Married is computed for individuals of age 18 and above.

Roll-call voting data

Data on recorded votes comes from the website of the Chamber of Deputies. I collected data for votes that took place between March 2002 and September 2011, corresponding to the 2002-2006, 2006-2010, and 2010-2014 legislative periods. The total number of votes is 6,163, but this number reduces to 4,969 when considering votes for bills that were assigned to a specific committee, which determines the broader issue of the bill (*materia*).[4] In each of these votes I record the vote (favor, against, or abstain) of each deputy that exercises her right to vote. I also have information on the name of the bill, date and time, quorum required, and the vote of each legislator present in the room (in favor, against, or abstention). Table C-3 shows summary statistics for the proportion of votes in each broader issue. Particularly interesting for my analysis are the votes on Family issues, which accounts for 6% of the votes in the first legislative period. This is due to the reform to the Civil Code in 2004, which among other changes legalized divorce, and the creation of the family courts.

Table C-4 presents the average of this variable for each of the congressional periods (2002–2006, 2006–2010 and 2010–2014), each of the coalitions and by gender of the legislator. Overall the variable ranges from 4% to 10%, but it shows important differences across coalitions and

[4]The Cámara de Diputados has 25 committees, and therefore there are 25 *materias*. I aggregate some of these to finally obtain 12 broader issues.

gender. The table also shows that in party unity votes around 10% of the legislators vote differently from their coalition, as opposed to 4% for non-party unity votes.

Table C-3: Votes in the Chamber of Deputies, summary statistics.

Congress	2002-2006	2006-2010	2010-2011[a]
Agriculture	8.92	8.89	12.14
Defense	5.11	1.94	1.97
Education	10.56	14.21	15.86
Finance	12.89	26.73	23.80
Government	10.41	8.94	9.33
Justice	14.53	12.27	12.80
Mining	4.81	3.78	4.59
Public works	5.90	5.96	5.91
Foreign relations	6.79	5.96	2.45
Health	8.38	4.02	4.04
Labor	5.65	5.56	4.39
Family	6.05	1.74	2.71
Total number of votes	2,017	2,013	951

Notes: Each number indicates the proportion of votes in each category. [a] Data up to 9/7/2011.

Table C-4: Proportion of votes differing from own coalition

Congress	2002–2006	2006–2010	2010–2014[a]
all legislators	0.063	0.066	0.077
center-left	0.043	0.065	0.121
men	0.044	0.066	0.123
women	0.037	0.059	0.109
center-right	0.086	0.067	0.028
men	0.085	0.067	0.028
women	0.101	0.069	0.029
no party unity vote	0.044	0.045	0.057
party unity vote	0.102	0.101	0.112
Observations	173,483	182,124	90,862

Notes: Each number corresponds to the proportion of votes where the legislator voted different from the majority of her own coalition. [a] Data up to 9/7/2011.

D. Close within-coalition elections: Sample averages

Table D-1 shows sample averages and mean-comparison tests for age and incumbency of male and female candidates running in close within-coalition elections. Columns 1-3 include elections with a margin of victory below 5 percent, while in columns 4-6 and 7-9 the margin of victory increases to 10 and 15 percent, respectively. The table shows that candidates' age and incumbency are balanced across gender for margins of victory of 5 and 10 percent. When less competitive elections are included, such as elections with a margin of victory up to 15 percent (columns 7-9), the table shows that the share of incumbent male candidates is significantly higher than the share of female candidates in the Center-Left. Age, however, remains similar across gender, as well as age and incumbency of Center-Right candidates.

Table D-1: Sample averages and mean-comparison tests

	Margin:	5%			10%			15%		
		Men	Women	Diff. p-value	Men	Women	Diff. p-value	Men	Women	Diff. p-value
Coalition	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Center-left	Age	43.750	49.250	0.384	46.294	48.294	0.600	47.846	48.423	0.855
	Incumbent	0.500	0.375	0.642	0.471	0.235	0.160	0.500	0.192	0.019
Center-right	Age	43.200	44.600	0.844	44.909	43.727	0.783	44.933	43.000	0.620
	Incumbent	0.400	0.200	0.545	0.182	0.364	0.362	0.333	0.333	1.000

Notes: The table shows sample averages for male and female candidates running in mixed-gender elections, as well as the p-value of a mean-comparison test, for various margins of victory. Age is the age of the candidate, in years. Incumbent is a dummy that takes the value of 1 if the candidate was in office and running for a subsequent term in the same district.