LEVELING THE PLAYING FIELD: UNDERSTANDING GENDER DISPARITY IN GUBERNATORIAL ELECTIONS AND POLICIES TO COMBAT IT

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ABSTRACT:

Women have traditionally been underrepresented as governors across the U.S., although their vote shares have been increasing on average since the early 1990s. This paper shows that efforts to increase female electoral performance and participation through public campaign finance laws may be misguided. On the other hand, increasing the frequency of open elections via term limits has the potential to raise female vote shares and boost female enrollment in primaries. Compared to head-to-head elections against incumbent men, females perform at least 8.3 percentage points better when facing non-incumbent men. This result supports claims made about open elections in previous research.

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1. Introduction

Despite comprising over half of the American population, women currently hold only six out of 50 state governorships. This pattern of gender disparity persists even after broadening the lens: only 22.4% of all statewide elective executive offices are filled by women (CAWP 2011).[1] Perhaps most interestingly, this proportion is at its lowest since 1993 [D3].

These facts raise a beguiling question: why are women not better represented as governors? Several explanations are possible. First, voters could be biased to vote against women. If the electorate systematically views men as more fit for office than equally capable women, this imbalance could occur. Second, fewer women run for governor than do men. Since fewer women than men enter primary races, most primaries tend to send males to the general election. Third, states' electoral environments might be set up to prevent women from facing an equal opportunity of electoral success. Private fundraising, for example, might suit men more than women if men have more connections to wealthier backers or party elders. Additionally, incumbents generally outperform challengers by a wide margin. They enjoy broad name recognition and the valuable experience of running previous successful gubernatorial campaigns. As most incumbents are male, the advantage that incumbents face disproportionately favors men.

With respect to the third point about electoral institutions, some states have taken steps to make elections more equal for all participants. For example, in 2009, 13 states had some type of public funding available for gubernatorial candidates [D4, D5]. These laws are in part aimed to prevent candidates with deep pockets or savvy fund-raising expertise from enjoying an undue

[1] The measure includes governors, lieutenant governors, attorney generals, secretary of states, state treasurers/chief financial officers, state auditors, state comptroller, chief state education officials, commissioners of insurance, commissioners of labor, corporate commissioners, public service commissioners, public regulation commissioners, public utilities commissioners, and railroad commissioners.

advantage in the campaign. Whatever financial advantage men might have over women would be at least diminished, if not eliminated, with public campaign finance laws. Regarding the "incumbency advantage," 36 states now limit the number of terms a governor can spend in office (National Governors Association, 2012). Term limits have the effect of increasing gubernatorial turnover, resulting in more elections in which no candidate is incumbent. Men may or may not outperform women in these elections, but without a (typically male) incumbent on the ballot, women may fare better than they otherwise would have.

This thesis has two central aims. It will first identify the magnitude and nature of the vote share disparity between male and female gubernatorial candidates. It will then explore the effectiveness of public funding and term limits in leveling the playing field for women. If access to public campaign funds causes the vote share gap between men and women to shrink, states seeking fairer gubernatorial elections will have further impetus to enact or preserve this type of law. Moreover, if the male-female vote share gap narrows in open elections relative to elections with an incumbent, states that lack term limits will have more reason to enact them. Voters' gender biases need not lead to female underrepresentation if counteracted with appropriate policy. Although societal animus towards women in power is a problem in its own right, this paper will attempt to provide policy recommendations to mitigate this potential prejudice and prevent it from keeping capable women out of office.

Female underrepresentation in the governor's mansion is problematic for three main reasons. Primarily, women as a group might have political demands that only female governors can sufficiently address. As a result, underrepresentation might skew policy priorities and legislative outcomes to suit men more than women. Chattopadhyay and Duflo's (2004) research,

explained below, demonstrates that this effect occurs in India. Additionally, men can perpetuate their electoral advantage by ensuring that electoral processes favor them and disfavor women.

Secondly, the position of governor prepares its officeholders well for a future in higher-level federal positions: throughout history, many Senators, Presidents, cabinet members, and other high-ranking federal officials were once governors. In many cases, their role as governor helped them move forward in their career, because of the leadership experience gained, political connections formed, and name recognition garnered while in office. Inequality at the level of governor can consequently have the knock-on effect of unequally preparing men for future positions elsewhere in government vis-à-vis women.

Finally, if institutionalized discrimination does exist, the outcome is both inefficient and morally troubling. Asymmetrical outcomes across gender in any context, especially for positions of power, are a social problem. Here, bias against women governors implies that more effective female candidates might be passed over for their male opponents. Additionally, feedback effects can exacerbate and reinforce the situation: barriers to entering state government disincentivize females who would otherwise be interested in politics to invest in human capital. These three issues—unequally met political demands across gender, knock-on effects for higher positions, and inequitable and inefficient outcomes—all speak to the importance of exploring gender disparity among gubernatorial candidates.

This paper finds evidence that men tend to outperform women on average across gubernatorial elections. This vote share gap has followed a non-linear trend over time, increasing from 1977 to 1992 or 1993, and narrowing ever since. Despite its potential benefits in other contexts, public funding for gubernatorial candidates does not appear to have any positive effect on female vote shares or female participation in primaries. When females participate in open

general elections, they tend to perform as well as when they are incumbents and over 8.3 percentage points better than when facing a male incumbent. Moreover, open primaries are shown to draw in more females than primaries with an incumbent, although the gender composition of the primaries does not change. Female challengers in general elections also enjoy on average a 1.7 to 1.9 percentage point vote share increase when they increase their share of total spending in the election by 10%. The results point to the potential gender equity gains that could result if states enacted or enhanced their current gubernatorial term limit laws and helped challengers raise sufficient funds.

2. Literature Review

Much of the literature on American female electoral outcomes comes from the field of political science. Here, scholars have examined the causes and consequences of political underrepresentation of females in politics at a theoretical level, often analyzing issues of culture, institutions, legitimacy, and sex-role socialization (e.g. Sabonmatsu 2002; Windett 2011). Although these papers' theoretical claims may have merit, the most relevant literature for this exercise employs technical, testable approaches, given their explanatory power. Many economists (or economic-minded political scientists) have tackled similar questions of disparity while incorporating rigorous econometric techniques. Although their methodology sometimes fails to answer the broader social questions broached by political scientists, it nonetheless estimates precise measures of underrepresentation and voter choice.

Two distinct strands of thought are evident in the literature that assesses unequal female representation in government. One analyzes the way institutions and electoral processes are set up, and how they preclude female success at the ballot box. Welch et al. (1985) find that, controlling for party, urbanization, and incumbency status, women are equally likely to win U.S.

Congressional elections as men. Underrepresentation persists because the advantage that (predominantly male) incumbents enjoy, and because of the dearth of female candidates who enter elections. If women could be convinced to run for more open seats, they argue, proportionally more would be voted into office. Andersen and Thorson (1984) reach similar conclusions about the role of incumbency in systematically preventing women from entering Congressional office. Their model's results predict that even doubling the number of female nominees will not lift their representation in office much, because of incumbents' advantage. Increasing incumbent turnover, on the other hand, would substantially assist women vying for office. These conclusions, taken with Welch et al.'s (1985), suggest that increased female representation will occur most rapidly if women target open seats. Their analyses also imply that term limits might equivalently reduce gender disparity, since term limits increase the frequency with which open seats appear.

Lee (2008) tests this issue of incumbency advantage more directly. Although he does not analyze the effect of gender, Lee employs a regression discontinuity approach to estimate the advantage that candidates from incumbent parties in U.S. House elections enjoy. Incumbent party advantage is slightly different than incumbent candidate advantage, which is a focus of my research, because the latter effect is a subset of the former. Regardless, his findings are relevant because the two concepts are similar. In fact, incumbents tend to run for reelection 88% of the time, so the incumbent party advantage is usually identical to the incumbent candidate advantage. Lee's results show that if a candidate's party barely won the previous election, he will receive between 7 and 8 percentage points more in the current election that if his party barely lost. This corresponds to a 45 percentage point increase in the probability of winning. As most incumbent candidates are male, this incumbency effect ought to be distinguished from a

gender effect. I pay special attention to the possible entanglement of the two in the results section below.

U.S. House elections might be systematically different than gubernatorial elections, however: gubernatorial elections involve entire states, whereas House elections occur in smaller, typically more homogenous congressional districts. To understand the wide range of electoral successes for female gubernatorial candidates across states, Oxley and Fox (2004) employ a model that quantifies four general social characteristics within each state: its political system, party recruitment processes, candidate supply, and gatekeeper demands. Most notable for my research, they find that the supply of female candidates is the most influential out of the four broad measures in predicting the number of women candidates and the number of women officeholders. As shown below, public funding does not expand the supply of candidates but open elections do. Therefore, increasing the number of open elections through term limits might increase the number of female governors. Those states which have a higher than average percentage of female lawyers and lower than average moralistic and traditional cultures should see a higher supply of female candidates in races for governor.

Windett (2011) considers a similarly defined "female socio-political subculture" within each state to measure its effect on female candidate success specifically for gubernatorial races. His findings echo Welch et al. (1985) and Andersen and Thorson (1984) in that open seat elections have a statistically significant effect on predicting whether primaries feature a female candidate. My research goes one step further, showing that open seat general elections help predict whether a Democratic (but not Republican) female will appear in the general election. Additionally, he shows that a state's cultural history and attitude towards gender equality are robust predictors of the frequency with which females run for governor and win. Over time, he

predicts that the interstate difference will fade, and women's experience across states will not be as varied. Given the importance of state culture in determining female participation and success, Windett's (2011) findings imply that my specifications should employ state fixed effects to prevent unobservable cultural characteristics from biasing my results.

The second relevant line of inquiry in the literature explores biases specific to the voting bloc, which addresses the issue of gender discrimination. In her paper exploring how stereotypes and bias affect female politicians, Lawless (2004) conducts a survey and finds strong evidence of gender bias when voters evaluate candidates; that is, men and women in office have different perceived strengths. When war, foreign policy, and terrorism are made salient—as they were following the attacks of September 11, 2001—Lawless's model predicts that women running for President are disadvantaged compared to otherwise equal men. This suggests, at least for national elections, voters employ biases when making decisions at the ballot box. Dolan's (2008) paper demonstrates that biases such as these are not uniform across the population. Although voters tend to favor own-sex candidates, this effect differs across party: it is accentuated when the candidate is a Democrat and muted when a Republican. Taken together, Dolan's (2008) and Lawless's (2004) results illustrate that gender bias exists among voters, but it is not uniform across voters or across political environments.

Several findings from India indicate that increasing gender parity in office have broader social benefits, although their relevance may be limited given the substantial differences between Indian and American political environments. Chattopadhyay and Duflo (2004) and Beamen et al. (2012) both take advantage of a natural experiment in India. A constitutional amendment in 1993 required a third of all chief positions to be reserved for women, randomly applied across villages. The former paper found evidence that women invested in infrastructure more demanded by

women than men. This result suggests that, at least in the two states studied in India, women and men in office pursue policies favored by constituents who share their gender. The latter paper provides evidence of a "role model effect." The authors compared parents' aspirations for their children, children's own aspirations, and children's time use and educational outcomes across villages. Gender gaps existed in villages where the position of chief was never reserved for a female. In the other villages, however, the gaps were often reduced. For example, the difference between grade completed for boys and girls dropped in these villages relative to villages without seats reserved for women. The authors conclude that when a woman leads a village, she provides a role model for the female children in her village, who subsequently raise their aspirations (as do their parents) and invest in themselves. This suggests that girls lacking role models of women in political power suffer relative to boys. Nevertheless, it is important to note that these papers analyze India's culture and political structure, which is distinct from America's. One must therefore take these findings with a grain of salt when hypothesizing the positive impact from increasing female gubernatorial representation on youth in the U.S.

Most relevant to my research is Werner and Mayer's (2007) analysis of the interaction between public funding and gender in state legislature races. In Maine and Arizona, two places that had recently enacted public campaign finance legislation, the authors show that "clean elections" affected neither the gender makeup of state primaries nor the gender makeup of the state assemblies themselves. These results align with the findings presented below. The focus of their paper then shifts to predicting the likelihood of accepting public funds for election. For state house races, being female positively predicts whether a candidate will take advantage of public funding. The result is statistically and economically significant, but the effect disappears for state senate races.

Much of the literature on gender equality in state elections has analyzed female performance in legislative elections and their subsequent representation in the legislature. This paper will add to the field by focusing on gubernatorial gender disparities, an area that has received less attention. In doing so, it will highlight the similarities and differences between the two branches, with regards to female electoral outcomes. Furthermore, by testing two policies, it will evaluate the role each play in ensuring equal electoral outcomes across gender. Its findings will be meaningful for practitioners and academics alike.

3. Data

3.1 Data sources

The data for this paper comes from several different sources. Additional supplementary sources were sometimes used, and they are noted throughout the text. The following details the most important ones.

Gubernatorial Campaign Expenditures Database

Beyle and Jensen's [D1] Gubernatorial Campaign Expenditures Database make up the bulk of data in this study. The two scholars have compiled information on gubernatorial candidate expenditures for both primary and general elections across all 50 states dating back until 1977. (More data is available as far back as 1968, but it is not as complete.) The dataset includes information on a given candidate's name, state, party, primary election spending, general election spending, primary election vote share, and general election vote share. A variable that denotes the candidate's previous occupation is also included, although is missing in many cases. The dataset is organized by year. Beyle and Jensen aggregated this information from publicly available publications, and they cite their primary sources in the codebook of the

dataset. The sources are too various to name here, but include the Congressional Quarterly Weekly Report and the office in each state that oversees election reports.

Congressional Quarterly's Guide to U.S. Elections

The Gubernatorial Campaign Expenditures Database lacks vote share information on a handful of state elections. Congressional Quarterly's *Guide to U.S. Elections*, 4th ed. [D2] fills in these gaps, providing general election vote share data for the candidates of these elections.

Center for American Women and Politics

At Rutgers University, the Eagleton Institute of Politics runs the Center for American Women and Politics (CAWP), which provides a wealth of current and historical information on women at all level of politics. Their fact sheet entitled "Women Candidates for Governor 1970-2008" [D3] identifies all general election races involving a female candidate. Moreover, the fact sheet describes whether the female was challenging an incumbent, running for an open seat, or defending her seat as an incumbent.

CommonCause.org

CommonCause.org [D4] is a nonpartisan advocacy group whose self-described aim is to help citizens "make their voices heard in the political process and…hold their elected leaders accountable to the public interest." To this end, they pay close attention to campaign contributions' effect on policy. Their website summarizes the public campaign finance environment across states. In addition, the website lists the links to these states' enforcement agencies and the text of the law. Also available for several cases is the year in which the law was passed.

National Conference of State Legislatures

Although this organization [D5] focuses on state assemblies, it provides details on the type of public financing laws across states. In this sense, it supplements and verifies the data from CommonCause.org [D4]. Moreover, this resource has information on the specific type of public funding programs, denoting whether a state's program provides full or partial funding for candidates' campaign expenditures.

3.2 Data and Descriptive Statistics

The data contains statistics on 424 general gubernatorial elections in the US and their respective primaries, dating from 1977 through 2009. Most of the 50 states have quadrennial elections, though several change from biennial to quadrennial at some point in this date range (Table 1). The most popular year to have an election is two years off of the presidential election cycle (i.e. 1978, 1982, 1986,...), which is when 36 states currently hold their elections (Figure 1). Although each observation in the raw data set is a candidate, I aggregate this information to the election level for most of my analysis. In total, there are 3,523 candidates in the data, representing the entire universe of primary and general election candidates over this 33 year time period. Of the 3,523 candidates, approximately 24% appeared in—and received at least 20% of the vote in—their respective general election (Table 2). Those candidates who received less than 20% of the general vote are not counted as general election candidates in my analysis for several reasons. For one, the election data taken from the Congressional Quarterly's *Guide to U.S. Elections* [D2] only have information for candidates receiving over 5% of the general vote. To maintain consistency, therefore, I forced any general candidate's vote share in my existing data to zero if it was less than 5%. Additionally, those candidates who received between 5 to 20% of the vote were generally fringe candidates or irrelevant to the race. They were not likely to be viable contenders. Public campaign financing laws and term limits would have done little to increase

their chances of winning. Once candidates receiving under 20% of the vote are dropped from my sample, I reweight the vote shares for the remaining "contending" candidates such that they add to 100%. For example, if three candidates entered a general election and received 45%, 45%, and 10% of the vote, I dropped the candidate receiving 10% and tagged the election as a two-person election. Finally, I reweighted the remaining candidates' vote shares from 45% each to 50% each.

Because candidate gender was only available for general election candidates, I had to manually denote primary candidates' gender. Of these, women comprised at least 10.6% of the pool. The gender of another 2.4% of the pool is indeterminate, making this 10.6% figure a lower bound. The CAWP fact sheet [D3] allowed me to identify the gender of every general election candidate. Of general election candidates, the composition is quite similar—women comprised 10.4% of the pool, and men the remaining 89.6% (Table 3).

Between 1977 and 2009, 40.5% of all primary candidates were Democrat and 35.7% were Republican (Table 4a). The remaining 23.8% were either Independent or a third party (the two types of candidates are treated as members of the same "non-major party" group). Restricting the scope exclusively to general elections, the share of third party and independent candidates in the candidate pool dropped dramatically to 1.6%. This occurred because relatively few of these candidates mustered enough support to gain at least 20% of the general vote, preventing them from being counted as general candidates in accordance with my methodology. Democrats and Republicans split the remaining general candidates evenly, representing 49.4% and 49.0% of the candidates respectively (Table 4b).

Looking across all primary candidates, women represented a relatively large proportion of third party and independent candidates (at least 13.6%) and small proportion of Republican candidates (at most 9.0%) (Table 5a). Because the gender of a small part of the sample is

unknown, these percentages cannot be pinned down precisely. Looking within gender, one interesting characteristic is evident: at the primary level, more women were third party and independent candidates than were Republicans (30.5% to 26.2%). For men, that distribution was 22.4% to 37.4%. Regardless, a plurality of primary candidates within each gender were Democrats. Slightly different results appear for general elections (Table 5b). Women were relatively better represented as Democratic candidates (13.5%) than as Republicans (7.4%) or third party/independent (7.1%). Looking within gender, a man was more likely to be a Republican (50.7%) than a Democrat (47.7%). The reverse was true for females, by a wide margin: 64.0% were Democratic candidates, and 34.8% were Republican.

As would be expected, the vast majority of the 424 general elections—95.1%—featured only two candidates that received at least 20% of the vote (Table 6a). Candidates receiving below 20% are not considered, as mentioned above, since they are an unlikely threat to win the general election. The remaining non-two-person elections had either one candidate (1.7%) or three candidates (3.3%). Looking only at the two-person elections, just two of them, or 0.5%, featured two female candidates (Table 6b). 19.6% pitted a man versus a woman, and the remaining 79.9% featured two men. Every single two-person election featured two candidates from the major parties. If a third party or independent candidate ran in these two-person general elections, he received less than 20% of the raw vote. Most candidates—73.8%—in three person elections received less than 40% of the reweighted vote (Table 7).

239 candidates, representing 6.8% of all primary candidates and 28.0% of all general candidates, were incumbents and ran in the general election (Tables 8a and 8b). 18 incumbents were defeated in their own party's primary and failed to advance to the general election. This is a relatively rare occurrence, happening to only 7.0% of incumbents who chose to stand for

reelection. Therefore, a total of 257 incumbent candidates entered their state's primary elections. One conclusion to draw from this information is that incumbents had an extremely high chance of making it beyond the primary round, conditional on their choice to run for reelection. A challenger, on the other hand, must fight two significant battles: one in the primary, against a field of other non-incumbents, and another in the general election, against an established incumbent. This fact—that incumbents entering the primary are quite likely to advance to the general election—complements Lee's (2008) finding that candidates from the incumbent party perform better than otherwise similar candidates from the non-incumbent party in general elections. This issue of incumbency is discussed further in the results section.

Turning now to male and female vote shares, Table 9a demonstrates that women received a lower proportion of the vote across all general elections, 50.0% to 46.1%. Omitting non-major party candidates, men continued to outperform women by a similar margin: 50.2% versus 46.4% (Table 9b). Splitting these figures into party, the gender gap persists. Republican, Democrat, and third-party/independent women all still underperformed men within their own party (Table 9c). These tables suggest that female underperformance relative to men was not symptomatic of one party in particular.

Focusing only on one male vs. one female elections—which do not feature any third party or independent candidates—women still lagged behind men (Table 10a). They received over 5 points less than men on average (52.6% to 47.4%). Women's unequal vote shares vis-à-vis men exist within party. Interestingly, races with a female Democrat facing a male Republican were closer on average than a female Republican facing a male Democrat (Table 10b). These one male vs. one female elections had another wrinkle when including the effect of incumbency. Women performed better when running in an open election, compared to an election with an

incumbent, shown in Table 11. This phenomenon, analyzed in the results section, likely occurs because more incumbents are men than women, so men are typically the beneficiaries of the incumbency advantage. As anticipated, incumbents solidly outperformed challengers by a 12 point margin, supporting Lee's (2008) findings (Table 12a). Moreover, incumbent males received a higher vote share than incumbent females, and challenger males did better than challenger females (Table 12b). On average, male incumbents defeated their female challengers by over 20 points, but female incumbents barely defeated their male challengers by 14 points. A woman tended to get the most votes as a Republican incumbent, and the least as a Republican challenger (Table 12c).

I now turn to the issue of public funding, again focusing only on one male vs. one female general elections. On average, the gap between women and men's vote share was slightly smaller in elections featuring public campaign finance laws, compared to elections without similar laws (Table 13a). It is hard to infer causality, obviously, since a number of unobservables could be driving both, such as the progressivity of a state or a time trend. In the next section, I explore in more depth whether any statistically significant effect of public funding on vote shares. In elections with incumbents, this effect is pronounced. Men outperformed women by a 8.0 point margin without public funding, but this margin dropped to 4.7 points when the laws were in effect (Table 13b). Surprisingly, the gender gap slightly widened in open elections, however. In other words, public campaign finance laws were correlated with a slightly larger average male vote share when looking only at open elections.

4. Results

4.1 Trends over time

Before estimating the impact of policy on female vote shares, it would be helpful to understand how the magnitude of gender disparity has changed over time. Table 14a shows the results from a series of regressions that estimate women's performance with time. Specifically, the dependent variable is the female vote share for a particular two-person (one male vs. one female) general election. The results from columns 1-3 suggest that for two-person elections, women's vote shares have been improving mildly over time at a rate of about 0.2 percentage points a year. This increase is statistically different than zero at the 10% level in column 1, but the significance disappears after adding state fixed effects in column 2 and including party controls in column 3. Under these specifications, therefore, I cannot rule out a lack of female improvement over time.

Shown in Figures 2 and 3, a glance at the residuals from the regressions featured in columns 1 and 2 suggests that a non-linear specification might be more appropriate. In both figures, the error terms are generally negative in the middle third of my time period, and generally positive at the beginning and end. A functional form that allows for a non-linear time trend might therefore be more suitable. Such a method yields the results shown in columns 4-6 of Table 14a. The coefficients imply a convex trend in female vote shares, reaching a low point in either 1992 or 1993. Figure 4 plots the relationship between female vote share and time, which looks generally positive. Furthermore, the lowest female vote shares appear between 1986 and 1999, consistent with the convexity in female vote shares suggested by the results in columns 4-6. Column 6 also indicates that female Democratic candidates' vote shares have been about 4.4 percentage points higher than female Republican candidates' over time, which is significant at the 10% level.

These findings are puzzling, since they imply that women's electoral outcomes were worsening for the first half of my sample, on average. Indeed, this finding might be an artifact of my eligibility specifications. As mentioned above, I eliminate any candidate receiving under 20% of the vote and reweight the remaining candidates' vote shares, to more clearly analyze the two-person, head-to-head interactions between prominent male and female candidates. It could actually be the case that women have been improving over time at a linear pace, and that a higher proportion of female candidates early on in my sample received below 20% of the vote, compared to later on in my sample. Throwing these candidates out could have consequently biased my sample. To test this, I include candidates that received between 5% and 20% of the vote and run the same regressions shown in Table 14a. The results of this robustness test appear in Table 14b. Again, under a linear specification, I cannot reject the hypothesis that women's vote shares have been stagnant over time, given the statistically insignificant coefficient estimates in columns 1-3. Rather, even after including these fringe candidates—which include third party contenders—it seems that female performance has been following a convex path over time, as the coefficient estimates in columns 4 and 5 are significantly different than zero at the 10% level. Adding party controls in column 6 decreases the t-statistic on the coefficient estimate of *time* too low to be significant at conventional levels, but this is likely a product of variability in vote shares and a small sample size. Despite this last result, the convexity of female vote shares over time is generally robust across a number of specifications. The non-linear models presented above predict that female vote shares of general election candidates in two-person elections were dropping on average until between 1992 and 1994, before turning upwards.

Table 14c and Figure 5 both give additional evidence that female vote share has a convex shape over time. Across each year in my data, I calculate the average female vote share in that

year's general gubernatorial elections. Some years, particularly years with only a handful of elections, lack female candidates. Additionally, this exercise gives only a rough depiction of female performance over time, since years with one female candidate are treated the same as years with many female candidates—i.e., as one point on the scatterplot or as one data point in my regression. Despite these caveats, the general convex shape of female performance over time is supported by the coefficient estimates in Table 14c and the scatterplot in Figure 5.

A potential explanation of this convex relationship between female vote share and time is the national political context.[2] From the start of the sample period (1977) until 1981, the President of the U.S. was Jimmy Carter, a Democrat. In 1981, Ronald Reagan, a Republican, was sworn in, and Republicans controlled the White House until the 1992 election. That year, Democrat Bill Clinton was elected to the White House, where he served until 2001. To the extent that a conservative political climate coincides with poorer female electoral outcomes, these shifts from Democrat to Republican to Democrat again might potentially explain the initial drop in female vote shares, before reversing in the early 1990s. Even if this relationship is not causal, it supports the notion that Americans might generally have favored male candidates during the 1980s, when female vote shares are predicted to be lowest in the sample. Future research could investigate this dip in female vote shares more fully than the cursory hypothesis presented above.

4.2 Effects of public campaign finance

Public campaign finance might increase female vote shares in two-person elections if, on average, men have an easier time raising funds or have more personal wealth to spend in an election than women. If candidates are given access to public funds, women might benefit more than men and experience more success. Table 15 displays the results from a series of regressions

[2] The following hypothesis was suggested to me by my advisor, Professor Richard Ball.

designed to test this hypothesis. Across all specifications, the effect of public funding is not statistically different than zero. These findings expand Werner and Mayer's (2007) to all states, specifically that public funding does not significantly impact electoral outcomes differently across genders. Column 1 in Table 15 shows the results of a simple correlational regression between the availability of public funding and female vote share. The coefficient is statistically insignificant, which initially implies that there is no correlation between taxpayer-funded campaign finance and female vote share. After including a party dummy and a party-public funding interaction in column 2, the results remain insignificant. Public funding, however, is endogenous in these equations, since states with state-funded campaign laws might be expected to be more progressive and be more willing to vote for women. Alternatively, this correlation could exist because female governors, once elected, might be more likely to enact public campaign finance laws. In both of these hypothetical examples, public funding does not cause higher female vote shares, so I am forced to employ additional specifications to test for causality.

Between 1977 and 2009, seven states enacted some type of public campaign finance law, one state repealed its law, and another state did both. To account for the issue of endogeneity raised above, I therefore restrict my scope to these states that changed their public campaign finance laws at some point in time during my sample. This method drops states that always had the laws, or never had the laws. The sudden change to the electoral landscape can be used to estimate the effects, if any, of public funding on women's performance. In other words, assigning a causal link between public funding and female vote share becomes more plausible. The results are presented in column 3. Unfortunately, I cannot reach any conclusions from the regression due to sample size constraints: only 18 elections featuring one male and one female

occurred in these 9 states during the sample time period. The coefficient on public funding is negative, which is unexpected, but with a t-value of -1.35, it is indistinguishable from zero.

An alternative method of testing the effect of public campaign finance employs state and time fixed effects across all states, even those that did not experience a change in policy. The model, borrowed from Angrist and Pischke (2009), takes into account states' changing characteristics over time, whereas basic state fixed effects does not. For example, a state might have become more accepting towards female candidates over time. This could translate into an increasing female vote share over time on average for the given state. A traditional state fixed effects technique, however, imposes the assumption that cultural attitudes towards women do not change with time. Using Angrist and Pischke's framework, the basic model is presented below:

$$FVS_{st} = \alpha\gamma_{s|t=0} + \beta\sigma_t + \eta\gamma_s{*}t + \delta D_{st} + \varepsilon_{st}$$

The female vote share of an election in state *s* and year *t* is the dependent variable (*FVS*). This is regressed on a binary variable for public funding *D*. The model includes a fixed effect term for time (σ_t) and for state (γ_s), in addition to an interaction term between the state fixed effect and time. This interaction term allows for differing trends in female vote shares across states over time, as explained above. The coefficient estimate for δ is of interest. A positive estimate would support the hypothesis that women perform better in elections in which public campaign finance is available.

Displayed in column 4 of Table 15, the results do not yield any meaningful conclusions. Because of the variability in vote shares and the limited sample size, the t-values are miniscule. One cannot infer that public funding has any effect on female vote share in two-person elections. Moreover, at -26.9, the coefficient estimate on public funding is too large to be credible. The Angrist-Pischke methodology is not helpful in this case.

Females across different types of races—open, male-incumbent, and female-incumbent—may face experience different effects when public campaign finance is available. In order to allow for this possibility, columns 5-7 include dummy variables for male-incumbent elections and female-incumbent elections, which are also interacted with the public funding dummy. For all three types of general elections listed above, public campaign finance does not have a statistically significant effect on female vote share. This finding supports the results above.

Throughout this analysis, I have treated public funding laws as identical across states. By failing to account for differences in the laws, I could be treating what is really a heterogeneous variable as binary. On the other hand, my sample size is limited; I cannot break up the public funding variable into too many categories and still maintain sufficient power to infer causality from my estimates. Nevertheless, I split public funding laws into two categories to test for heterogeneous effects: partial funding laws and full funding laws. The former type supplies only a fraction of a candidate's campaign funds. These laws make available for candidates either matching grants—whereby the candidate's private fundraising is matched by the state government—or a flat subsidy. Full funding laws go further and prohibit a candidate from spending privately raised cash on a campaign. Column 8 presents the coefficient estimates of a specification that uses these two variables in lieu of the blanket "public funding" variable. Column 9 does the same, but with a sample limited only to those 9 states whose laws were enacted or repealed over the sample period. Neither specification produces statistically significant coefficient estimates for either type of campaign finance variable. In column 9, the point estimates of both are economically significant and negative, but are statistically indistinguishable from zero.

The evidence from the exercises above does not support the notion that the availability of public funding improves women's outcomes in gubernatorial elections. Of course, the data does not make note of whether candidates exploited the potential public funding available to them. Because of this fact, the results in Table 15 represent intent-to-treat estimates, as opposed to estimates of treatment on the treated. Data on the uptake of public funds would be necessary to the find latter, which unfortunately was unavailable for this project. Whereas the results presented above do not demonstrate that the *availability* of public campaign finance affects female vote share, additional data would be necessary to estimate the effects of the *provision* of public campaign finance on female performance.

4.3 Open elections

In order to test the effect term limits might have on equitable gender representation, I shall explore how the differential between men and women's vote shares is affected by the presence of an incumbent. Incumbency confers many advantages to candidates running for reelection, including name recognition and a record of leadership. Incumbents often do not face a challenger in the primary election, allowing them to focus their campaign's efforts and money on defeating their general election opponent(s). As indicated by Table 16a, an overwhelming majority (93.3%) of incumbents are males. Male candidates, therefore, disproportionately enjoy the incumbency advantage compared to women. Because term limits reduce the number of elections featuring an incumbent, this inequality across genders might be lessened with appropriate term limit policy. Furthermore, data from Table 16b demonstrates that open elections are more likely to feature a female candidate than elections with incumbents.

Table 16c shows the results from a series of regressions testing how women performed in open elections, compared to elections with incumbents. In open elections, neither candidate

benefits from being an incumbent since there are no incumbents competing. The specifications in columns 1 and 2 regress the reweighted female vote share in a two-person election on a dummy variable for an open election. A dummy for Democratic candidates and a Democrat-open election interaction term are added in columns 3, 6, and 9. Time controls are added in the specifications shown in columns 4-9. Specifications 7-9 add a dummy for elections in which the male was incumbent. Additionally, specifications 2, 3, 5, 6, 8 and 9 employ state fixed effects.

According to the specifications in columns 1-4 in Table 16c, competing in an open election (as opposed to one with an incumbent) has a statistically neutral effect on female vote share. This finding is robust across parties. Although the point estimates are all positive, their t-statistics are too small to be significant. Including both state dummies and time controls, however, the coefficient on *open* becomes significant at the 10% level, as shown in column 5. The result suggests that competing in an open election increases a female's vote share by 3.9 percentage points compared to competing in an election with an incumbent. This finding becomes statistically insignificant after controlling for parties in column 6, but this is likely a result of the data's small sample size.

The results in columns 7-9 decompose this "open-election" effect further. Generally, candidates can be in three different types of elections: open elections, elections with a male incumbent, and elections with a female incumbent. Up until now, the latter two types of elections were not distinguished from each other. Columns 7-9 make this distinction by adding a dummy variable for elections with a male incumbent (so the omitted category is elections with a female incumbent). According to columns 8-9, which use state fixed effects, women receive 3.4 to 3.8 fewer percentage points when the election is open compared to elections with a female incumbent, yet this effect is not statistically significant. Women receive 12.1 to 12.6 fewer

percentage points when the male is incumbent compared to when the female is incumbent, which is significant at the 0.1% level. Finally, women receive 8.3 to 9.1 fewer points on average when facing a male incumbent, compared to open elections. An F-test confirms that this gap is statistically significant at the 0.1% level in column 8 (without party controls) and at the 5% level in column 9 (with party controls). These results indicate women do not perform significantly better as incumbents than when the general election is open, but they do perform markedly better in both cases, by at least 8.3 percentage points, compared to elections with a male incumbent. Similarly, when *men* face other men in open elections, their vote share increases by 8.5 percentage points compared to when they face incumbent men, as illustrated by Table 16d. In other words, females' gains when switching from elections with incumbent males to open seat elections are comparable to (challenger) males' gains when switching from elections with incumbent males to open seat elections. Consequently, there is no evidence that term limits would hurt female outcomes, since female performance as incumbents is statistically indistinguishable from female performance in open elections. In fact, the effect of term limits would likely be benign, since female performance in open elections is much better than in elections featuring a male incumbent.

4.4 Increased female participation

Increased female entry into races represents another potential benefit from electoral laws. Considering primary elections, an uptick in female participation after public funding is enacted would suggest that the legislation "pulls" women into politics. Additionally, females might enter primaries more often when the election is open, as compared to when it has an incumbent, if women believe their chances of winning the election have increased relative to men's. The data shows that, over time, females became better represented in the pool of general election

candidates, although their representation has stagnated since the late 1990s (Figure 6). This trend hints that female participation at the primary level might also have been following a similar pattern.

First, I test (i) whether public funding increases the share of female candidates in primary elections, and (ii) whether public funding increases the absolute number of female candidates in primary elections. Table 17a shows the results, where columns 1 and 2 address the first question, and columns 3 and 4 address the second. All four specifications control for party as well as time. There is no evidence from these regressions that public campaign laws have any effect on increasing the share of female candidates in primary elections, or on increasing the number of female candidates in primary elections. This finding generalizes that of Werner and Mayer (2007) to all states, since it fails to show that the availability of public campaign funds has any effect on the gender makeup of the pool of primary candidates. Over time, however, female participation has been increasing. With each passing year, women make up 0.3 percentage points more of the primary candidates, ceteris paribus. Democratic primaries also feature a larger share of female candidates compared to Republican primaries, on the order of 5.0 percentage points.

Second, I test (i) whether open elections feature a greater share of female candidates in primary elections, and (ii) whether open elections feature a greater absolute number of female candidates. The evidence is presented in Table 17b. As columns 1 and 2 demonstrate, females are not disproportionately encouraged to run for governor when a primary election lacks an incumbent candidate, compared to men. The coefficients have a positive sign, indicating that open primaries may feature a slightly greater share of female candidates than primaries with incumbents, but the t-statistic in both cases is too small to be distinguishable from zero. On the other hand, in columns 3 and 4, the absolute number of women running in primary elections is

significantly higher for open elections. On average, an open primary election attracts 0.13 more female candidates than if the primary were to feature an incumbent. Although this estimate is statistically significant at the 1% level, its economic significance is modest: it represents an increase of only 0.18 standard deviations of the average number of female candidates in a primary. The coefficients across all four specifications on *time* and *democrat* are similar to those from Table 17a.

The specifications whose results are presented in Table 17c approach the issue of female participation slightly differently. These specifications use a probit model to anticipate how open general elections and the existence of public funding might increase the probability of a woman appearing in the general election. The probit regressions in the even columns (2, 4, and 6) use state fixed effects, forcing some states to be omitted from the sample if they never had a female general election candidate. The coefficient estimates in all probit tables presented represent the marginal effects at the average of each independent variable. Holding time constant, women are no more likely to appear in open election than an election with an incumbent (columns 1 and 2), nor are they more likely to appear in an election if public campaign funding is available (columns 3 and 4). This is effect is robust after including both *open* and *public funding* as controls (columns 5 and 6).

These findings suggest that open elections and public funding fail to exhibit a significant effect on the probability of female appearance in general elections. These election characteristics might induce heterogeneous outcomes on candidates from different parties, however. Tables 17d and 17e show the results from the same probit regressions as above, but specify the party of the female candidate appearing in the general election. In Table 17d, open elections appear to have a statistically significant influence on the likelihood of a female Democratic candidate appearing in

the general election. Without state fixed effects, open general elections are associated with a statistically significant 34.0 to 34.1 percentage point increase in the probability of a female Democrat appearing in the general election (columns 1 and 5). With state fixed effects, this effect increases to between 58.1 and 58.7 percentage points, significant at the 1% level (columns 2 and 6). The regressions that use state fixed effects have to drop over a quarter of the sample, however, because some states never featured a female Democratic general election candidate (who received over 20% of the raw vote share). Consequently, the true effect of open elections on female general Democratic candidate appearance is likely somewhere between the two estimates presented above. Throughout the specifications, on the other hand, public funding's effect on female Democratic candidate appearance is negligible, supporting the findings in Table 17c.

Female Republican general candidate emergence, on the other hand, does not appear to be affected by the open general elections. With and without state fixed effects, open elections do not significantly increase the probability that a female Republican will appear in the general election (Table 17e, columns 1 and 2). This finding is robust when adding a control for public funding (columns 5 and 6). Public funding itself, however, initially appears to have a large positive impact: columns 3 and 5 suggest that the availability of campaign funds is associated with a 53.2 to 53.3 percentage point increase in the likelihood of a female Republican participating in the general election, significant at the 1% level. Once state fixed effects are used, this coefficient loses statistical significance. In other words, looking within each state, the existence of public funding is not associated with a higher likelihood of a female Republican general election candidate. This casts doubt on the 53 percentage point boost observed without fixed effects, since this coefficient is possibly so large because states with public funding are also

the same types of states where female appearance in general elections would be relatively high anyway. Consequently, one cannot conclusively assert that public funding causes a higher prevalence of female Republican general election candidates.

4.5 Campaign spending

The Gubernatorial Campaign Expenditures Database [D1] has limited information on candidates' spending over the course of an election. Unfortunately, this data is missing for many elections, which limits the sample of data even further than before. To the extent that the elections with spending data systematically differ from the elections without data, this sample may provide an inaccurate picture of the true effects of campaign spending in state gubernatorial elections. In Table 18a, all two-person, "co-ed" general elections since 1977 are displayed, separated into two groups: for one group, data on general election spending is available in the Gubernatorial Campaign Expenditure Database, and for the other, it is not. A handful of states appear in both groups, and there are no obvious differences in terms of years represented. Nonetheless, I proceed in my analysis with caution, as my results should be interpreted carefully in light of the small and incomplete sample at hand.

The spending information is useful to determine if spending by women has a different effect on vote share than spending by men. If so, targeting public funds towards women might be a useful tool in increasing female outcomes at the ballot box. Table 18b shows the results from a series of regressions that analyze the link between vote share, spending, and gender. In columns 1 and 2, female vote share is regressed on the log of female campaign spending. Column 1 shows the results without state fixed effects; column 2 shows the results with state fixed effects. In both cases, female spending has a positive effect on female vote share, significant at the 10% and 5% level, respectively. According to the coefficient estimates, increasing a female's spending

amount by 10% would increase her vote share by 0.22[3] to 0.60 percentage points. Although this increase is statistically significant, its implications are minimal. Gubernatorial elections often cost hundreds of thousands of dollars to run, so a female candidate might not find it worthwhile to increase her expenditures by 10% to capture less than one additional percentage point of the vote.

Moreover, the regression above makes no attempt to control for male candidate spending. A woman might be reluctant to sink more cash into a campaign if her male rival will match her spending. In columns 3 and 4, I therefore add male candidate spending as a control. The coefficient estimates are little changed, however. Even holding male spending constant, a woman who increases her spending by 10% would still expect to see her vote share increase by an anemic 0.43 to 0.61 points. Again, these increases are statistically significant, but not economically so.

Alternatively, it might be helpful to contextualize the issue of spending into one of shares rather than absolute amounts. Columns 5 and 6 display the coefficient estimates for a female's share of total spending. Without state effects, the coefficient estimate is significant at the 0.1% level and has a moderate, positive magnitude. If a female increases the share of her spending (out of total candidates' spending) in a given election by 10%, she can expect a 2.1% increase in vote share. This increase is enough to tip an election in her favor in tight races. With state fixed effects, the same increase in share of spending is associated with an estimated 1.7% increase in vote share, which is significant at the 10% level.

Spending might have different effects for incumbents compared to challengers or open seat pursuers. The regressions in Table 18c therefore add controls for incumbency status and

[3] This value is computed from 2.350*ln(1.10). Future estimates of spending effects are calculated in a similar manner.

interactions between spending and incumbency. Holding incumbency constant, the log of female and male spending has no significant effect on female vote shares (column 1). These results persist when controlling for time as well, in column 2. Across both specifications, increasing a female's spending by 10% in a two-person election is not associated with a rise in vote share, regardless if the election has a male incumbent, a female incumbent, or is open. Columns 3 and 4 focus on female spending as a share of the total. According to the estimates in column 3, increasing a female's spending share in a general election by 10% is associated with a *decrease* in vote share by 1.8 percentage points, although this effect is not statistically significant. Similarly, if the female is an incumbent, increasing spending is not associated with a significant effect on her vote share. On the other hand, a 10% increase in spending when facing a male incumbent—i.e. as a challenger—is associated with 1.9 percentage point increase in vote share, significant at the 10% level.[4] Adding state fixed effects in column 4 does not change the statistical significance of this estimate, although it lowers slightly to 1.7 percentage points. This finding extends the work of Jacobson (1992), whose research showed that spending by challengers has a much greater effect than spending by incumbents on name recognition among voters. The results above show that for female challengers, Jacobson's purported increase in name recognition also coincides with increases in vote share. The data therefore shows no statistically significant relationship between spending and vote share for females who are incumbents or who are vying for open seats. As challengers, however, females who increase by 10% their share of total campaign spending relative to their rival enjoy a 1.7 to 1.9 percentage point boost in vote share, on average.

[4] (38.34-18.89)*ln(1.1)=1.854

5. Conclusion

Women have historically been underrepresented and performed poorly in elections for political office in the U.S., and gubernatorial elections are no exception. Between 1977 and 2009, female vote shares exhibited a secular, convex trend. Initially, average female vote shares fell, reaching a critical point around 1992 or 1993. This finding is robust across all specifications but one, and could be symptomatic of larger, national trends that favored male Republican candidates. Future researchers might explore this change in female outcomes over time more.

Although public funding might have positive effects for marginalized candidates, its effect is not felt differently across gender. This paper provides no evidence to policymakers enacting public campaign funding legislation will improve female success in gubernatorial elections. There might be other equity or public externality arguments to pass public campaign finance laws, but there is no proof that they will enhance female outcomes. Additionally, similar to Werner and Mayer (2007), this paper finds no support for the hypothesis that public funding changes the composition of the primary candidate pool or of the total number of female primary candidates. These programs do not change the gender composition of the general election, either, an effect that persists across both parties. Because of data limitations, this paper could only estimate the intent-to-treat effects of public funding laws. Estimates of treatment on the treated might yield different results and hold different policy implications. For this type of analysis, data on take-up rates of public funds would be necessary.

Turning to open elections, women who face a male incumbent perform at least 8.3 percentage points worse than women who run for an open seat and over 12 points worse than women who are incumbents. Similar to Lee's (2008) findings, this incumbency advantage is statistically significant. However, comparing the experience of women in open elections to

women who are incumbents challenges his results, since women's performance across the two types of elections are not statistically different. The incumbency advantage might differ for men versus women, or for U.S. House elections versus state gubernatorial elections. Moreover, open primary elections "pull in" roughly 0.13 more female candidates than primaries with an incumbent, although this effect does not significantly increase the female share of total primary candidates. Open general elections are associated with a 34 to 59 percent increase in the probability of a female Democratic candidate's appearance, but there is no such effect for female Republicans. My results indicate to the extent that term limits increase incumbent turnover, they would potentially increase women's vote shares and candidate participation as a whole, at least in the short run until more equitable electoral outcomes prevailed. Additionally, there is no evidence that female incumbents would be hurt by these term limits.

Finally, additional spending by female candidates was found to minimally increase vote share, although this effect disappeared after controlling for incumbency. For challenger females facing incumbents, however, increasing their share of total spending by 10% is associated with a ceteris paribus 1.7 to 1.9 percentage point lift in vote share. In short, this paper found that female vote shares and female participation are surprisingly resilient to potential policy remedies. There is no proof providing access to public finance will increase their electoral outcomes in gubernatorial elections. Targeting challengers with fund-raising efforts might help females in the short run. Additionally, the results support Welch et al. (1985) and Andersen and Thorson (1984), who show that increasing the frequency of open elections will decrease the gender disparities in public office. Enacting term limits in the 14 states currently lacking them, and tightening such laws in the remaining states, would likely help reduce gubernatorial gender imbalances.

DATA APPENDIX

Variable name: *year*
Data source: Gubernatorial Campaign Expenditures Database
Name of variable in original source: *Year*
Missing observations: 0/3523
Variable description: The year of a candidate's election
Frequency distribution/Descriptive statistics:

By candidate:

Year of election	Freq.	Percent	Cum.
1977	19	0.54	0.54
1978	299	8.49	9.03
1979	32	0.91	9.93
1980	79	2.24	12.18
1981	25	0.71	12.89
1982	306	8.69	21.57
1983	29	0.82	22.40
1984	87	2.47	24.87
1985	11	0.31	25.18
1986	295	8.37	33.55
1987	30	0.85	34.40
1988	67	1.90	36.30
1989	16	0.45	36.76
1990	282	8.00	44.76
1991	19	0.54	45.30
1992	98	2.78	48.08
1993	10	0.28	48.37
1994	340	9.65	58.02
1995	34	0.97	58.98
1996	92	2.61	61.60
1997	10	0.28	61.88
1998	288	8.17	70.05
1999	30	0.85	70.91
2000	86	2.44	73.35
2001	16	0.45	73.80
2002	342	9.71	83.51
2003	38	1.08	84.59
2004	103	2.92	87.51
2005	23	0.65	88.16
2006	296	8.40	96.57
2007	29	0.82	97.39
2008	70	1.99	99.38
2009	22	0.62	100.00
Total	3,523	100.00	

By general election:

Year of election	Freq.	Percent	Cum.
1977	2	0.47	0.47
1978	36	8.49	8.96
1979	3	0.71	9.67
1980	13	3.07	12.74

1981	2	0.47	13.21
1982	36	8.49	21.70
1983	3	0.71	22.41
1984	13	3.07	25.47
1985	2	0.47	25.94
1986	36	8.49	34.43
1987	3	0.71	35.14
1988	12	2.83	37.97
1989	2	0.47	38.44
1990	36	8.49	46.93
1991	3	0.71	47.64
1992	12	2.83	50.47
1993	2	0.47	50.94
1994	36	8.49	59.43
1995	3	0.71	60.14
1996	11	2.59	62.74
1997	2	0.47	63.21
1998	36	8.49	71.70
1999	3	0.71	72.41
2000	11	2.59	75.00
2001	2	0.47	75.47
2002	36	8.49	83.96
2003	3	0.71	84.67
2004	11	2.59	87.26
2005	2	0.47	87.74
2006	36	8.49	96.23
2007	3	0.71	96.93
2008	11	2.59	99.53
2009	2	0.47	100.00
Total	424	100.00	

Variable name: *state*
Data source: Gubernatorial Campaign Expenditures Database
Name of variable in original source: *State*
Missing observations: 0/3523
Variable description: The state in which a candidate is participating
Frequency distribution/Descriptive statistics:

By candidate:

State of election	Freq.	Percent	Cum.
AK	110	3.12	3.12
AL	84	2.38	5.51
AR	60	1.70	7.21
AZ	63	1.79	9.00
CA	131	3.72	12.72
CO	52	1.48	14.19
CT	40	1.14	15.33
DE	30	0.85	16.18
FL	75	2.13	18.31
GA	73	2.07	20.38
HI	96	2.72	23.11
IA	62	1.76	24.87
ID	51	1.45	26.31
IL	59	1.67	27.99
IN	42	1.19	29.18
KS	73	2.07	31.25
KY	76	2.16	33.41

LA	96	2.72	36.13
MA	50	1.42	37.55
MD	50	1.42	38.97
ME	68	1.93	40.90
MI	58	1.65	42.55
MN	85	2.41	44.96
MO	76	2.16	47.12
MS	69	1.96	49.08
MT	55	1.56	50.64
NC	76	2.16	52.80
ND	32	0.91	53.70
NE	65	1.85	55.55
NH	114	3.24	58.79
NJ	115	3.26	62.05
NM	60	1.70	63.75
NV	113	3.21	66.96
NY	71	2.02	68.98
OH	46	1.31	70.28
OK	71	2.02	72.30
OR	101	2.87	75.16
PA	59	1.67	76.84
RI	53	1.50	78.34
SC	49	1.39	79.73
SD	42	1.19	80.93
TN	103	2.92	83.85
TX	79	2.24	86.09
UT	56	1.59	87.68
VA	37	1.05	88.73
VT	112	3.18	91.91
WA	87	2.47	94.38
WI	58	1.65	96.03
WV	88	2.50	98.52
WY	52	1.48	100.00
Total	3,523	100.00	

By general election:

State of election	Freq.	Percent	Cum.
AK	8	1.89	1.89
AL	8	1.89	3.77
AR	10	2.36	6.13
AZ	8	1.89	8.02
CA	8	1.89	9.91
CO	8	1.89	11.79
CT	8	1.89	13.68
DE	8	1.89	15.57
FL	8	1.89	17.45
GA	8	1.89	19.34
HI	8	1.89	21.23
IA	8	1.89	23.11
ID	8	1.89	25.00
IL	8	1.89	26.89
IN	8	1.89	28.77
KS	8	1.89	30.66
KY	8	1.89	32.55
LA	8	1.89	34.43
MA	8	1.89	36.32
MD	8	1.89	38.21
ME	8	1.89	40.09
MI	8	1.89	41.98

```
                                    MN |          8        1.89       43.87
                                    MO |          8        1.89       45.75
                                    MS |          8        1.89       47.64
                                    MT |          8        1.89       49.53
                                    NC |          8        1.89       51.42
                                    ND |          8        1.89       53.30
                                    NE |          8        1.89       55.19
                                    NH |         16        3.77       58.96
                                    NJ |          9        2.12       61.08
                                    NM |          8        1.89       62.97
                                    NV |          8        1.89       64.86
                                    NY |          8        1.89       66.75
                                    OH |          8        1.89       68.63
                                    OK |          8        1.89       70.52
                                    OR |          8        1.89       72.41
                                    PA |          8        1.89       74.29
                                    RI |         12        2.83       77.12
                                    SC |          8        1.89       79.01
                                    SD |          8        1.89       80.90
                                    TN |          8        1.89       82.78
                                    TX |          8        1.89       84.67
                                    UT |          8        1.89       86.56
                                    VA |          9        2.12       88.68
                                    VT |         16        3.77       92.45
                                    WA |          8        1.89       94.34
                                    WI |          8        1.89       96.23
                                    WV |          8        1.89       98.11
                                    WY |          8        1.89      100.00
---------------------------------------+-----------------------------------
                                 Total |        424      100.00
```

Variable name: *female*
Data source: Lexis-Nexis; self-generated
Name of variable in original source: --
Missing observations: 84/3523
Variable description: The candidate's gender
Variable values and coding:

0: Male
1: Female

Frequency distribution/Descriptive statistics:

```
Dummy for a |
     female |
  candidate |      Freq.     Percent        Cum.
------------+-----------------------------------
         -9 |         84        2.38        2.38
          0 |      3,065       87.00       89.38
          1 |        374       10.62      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

Variable name: *party*
Data source: Gubernatorial Campaign Expenditures Database
Name of variable in original source: *party*
Missing observations: 0/3523

Variable description: The candidate's political party
Variable values and coding: Takes 3 values: "D" for Democrat, "R" for Republican, and "3rd/Ind." for a third-party or Independent candidate
Frequency distribution/Descriptive statistics:

```
Candidate's |
      party |      Freq.     Percent        Cum.
------------+-----------------------------------
   3rd/Ind. |        839       23.81       23.81
          D |      1,426       40.48       64.29
          R |      1,258       35.71      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

Variable name: *incumbent*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: Under occupation/job listing in original source, the following denoted an incumbent: : I; i; ia; i,l; i,ine; i, rea; i, ph; i, law; i, l; i, j; i, fce (Pierce); i, f; i, ed; i, bdc; i (did not run)
Missing observations: 0/3523
Variable description: The candidate's incumbent status in the primary election
Variable values and coding:

0: Candidate is not incumbent in the primary election
1: Candidate is an incumbent in the primary election

Frequency distribution/Descriptive statistics:

```
  Dummy for |
         an |
  incumbent |
  candidate |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      3,266       92.71       92.71
          1 |        257        7.29      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

Variable name: *incumbent_in_general*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: Under occupation/job listing in original source, the following denoted an incumbent: I; i; ia; i,l; i,ine; i, rea; i, ph; i, law; i, l; i, j; i, fce (Pierce); i, f; i, ed; i, bdc; i (did not run)
Missing observations: 0/3523
Variable description: The candidate's incumbent status in the general election
Variable values and coding:

0: Candidate is not incumbent in the general election
1: Candidate is an incumbent in the general election

Frequency distribution/Descriptive statistics:

```
  Dummy for |
```

```
        an |
  incumbent |
  candidate |
  who makes |
  it to the |
    general |
   election |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      3,284       93.22       93.19
          1 |        239        6.78      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

Variable name: *open*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: --
Missing observations: 0/3523
Variable description: Whether the candidate's general election has an incumbent running
Variable values and coding:

0: No incumbent is running in general election
1: Incumbent is running in general election

Frequency distribution/Descriptive statistics:

By candidate:

```
  Dummy for |
    an open |
    general |
   election |
   (i.e. no |
 incumbents |
   running) |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,734       49.22       49.47
          1 |      1,789       50.78      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

By general election:

```
  Dummy for |
    an open |
    general |
   election |
   (i.e. no |
 incumbents |
   running) |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        239       56.37       56.60
          1 |        185       43.63      100.00
------------+-----------------------------------
      Total |        424      100.00
```

Variable name: *pubfnc*
Data source: CommonCause.org, National Conference of State Legislatures
Name of variable in original source: --
Missing observations: 0/3523
Variable description: Whether the candidate had public campaign funding available in the election
Variable values and coding:

0: Candidate did not have access to public campaign funding
1: Candidate did have access to public campaign funding

Frequency distribution/Descriptive statistics:

By candidate:

```
  Dummy for |
  some type |
  of public |
   campaign |
finance law |
  in effect |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      2,799       79.45       79.45
          1 |        724       20.55      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

By general election:

```
  Dummy for |
  some type |
  of public |
   campaign |
finance law |
  in effect |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        337       79.48       79.48
          1 |         87       20.52      100.00
------------+-----------------------------------
      Total |        424      100.00
```

Variable name: *general_vote*
Data source: Gubernatorial Campaign Expenditures Database
Name of variable in original source: *genvot; genvote; generalvote*
Missing observations: 2160/3523
Variable description: The candidate's vote share in the general election
Frequency distribution/Descriptive statistics:

```
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
general_vote |      1363    30.17709    24.82476          0         82
```

Variable name: *reweight*
Data source: Gubernatorial Campaign Expenditures Database

Name of variable in original source: *genvot; genvote; generalvote*
Missing observations: 2160/3523
Variable description: The candidate's recalculated vote share in the general election, after eliminating marginal candidates (i.e. candidates receiving under 20% of the vote).
Frequency distribution/Descriptive statistics:

```
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
    reweight |      1363    31.10785    25.66656          0        100
```

Variable name: *gen_cand*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: --
Missing observations: 0/3523
Variable description: Whether the candidate participated in the general election
Variable values and coding:

0: Candidate did not participate in general election
1: Candidate did participate in general election

Frequency distribution/Descriptive statistics:

```
  Dummy for |
 candidates |
       that |
appeared in |
the general |
   election |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      2,668       75.73       75.73
          1 |        855       24.27      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

Variable name: *n_gen_cand*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: --
Missing observations: 2668/3523
Variable description: The number of candidates in the candidate's general election
Variable values and coding: Ranges from 1 candidate to 5 candidates
Frequency distribution/Descriptive statistics:

By candidate:

```
  Number of |
    general |
   election |
 candidates |      Freq.     Percent        Cum.
------------+-----------------------------------
```

```
          1 |          7        0.20        0.20
          2 |        806       22.88       23.08
          3 |         42        1.19       24.27
          . |      2,668       75.73      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

By general election:

```
  Number of |
    general |
   election |
 candidates |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |          7        1.65        1.65
          2 |        403       95.05       96.70
          3 |         14        3.30      100.00
------------+-----------------------------------
      Total |        424      100.00
```

Variable name: *democrat*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: *party*
Missing observations: 0/3523
Variable description: Whether the candidate was a Democrat
Variable values and coding:

0: Candidate was not a Democrat
1: Candidate was a Democrat

Frequency distribution/Descriptive statistics:

```
Dummy for a |
   Democrat |
  candidate |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      2,097       59.52       59.52
          1 |      1,426       40.48      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

Variable name: *republican*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: *party*
Missing observations: 0/3523
Variable description: Whether the candidate was a Republican
Variable values and coding:

0: Candidate was not a Republican
1: Candidate was a Republican

Frequency distribution/Descriptive statistics:

```
Dummy for a |
 Republican |
  candidate |      Freq.     Percent        Cum.
```

```
------------+-----------------------------------
          0 |      2,265       64.29       64.29
          1 |      1,258       35.71      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

Variable name: *third_party*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: *party*
Missing observations: 0/3523
Variable description: Whether the candidate was a third party or independent
Variable values and coding:

0: Candidate was not a third party or independent candidate
1: Candidate was a third party or independent candidate

Frequency distribution/Descriptive statistics:

```
Dummy for a |
third party |
  candidate |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      2,684       76.19       76.19
          1 |        839       23.81      100.00
------------+-----------------------------------
      Total |      3,523      100.00
```

Variable name: *lntotal_spend_real*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: *total; totalspent*
Missing observations: 2746/3523
Variable description: The natural log of the candidate's total amount spent on the campaign, in 2009 USD

Frequency distribution/Descriptive statistics:

```
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
lntotal_sp~l |       777    12.53868    4.273822          0   18.32599
```

Variable name: *_total_spend_real*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: *total; totalspent*
Missing observations: 2746/3523
Variable description: The candidate's total amount spent on the campaign, in 2009 USD

Frequency distribution/Descriptive statistics:

```
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
_total_spe~l |       777     4046439     8155826          0   9.10e+07
```

Variable name: *_2persontype*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: --
Missing observations: 2599/3523
Variable description: The type of 2 person general election the candidate faced
Variable values and coding: Takes 4 values: "mvf" if a male vs. female election; "mvm" if a male vs. male election; "fvf" if a female vs. female election; and "_multi" if more than 2 candidates were in the general election.
Frequency distribution/Descriptive statistics:

By candidate:

If 2 person general election, this was the gender composition	Freq.	Percent	Cum.
.	2,668	75.73	75.73
_multi	49	1.39	77.12
fvf	4	0.11	77.24
mvf	158	4.48	81.72
mvm	644	18.28	100.00
Total	3,523	100.00	

By general election:

If 2 person general election, this was the gender composition	Freq.	Percent	Cum.
_multi	21	4.95	4.95
fvf	2	0.47	5.42
mvf	79	18.63	24.06
mvm	322	75.94	100.00
Total	424	100.00	

Variable name: *pct_pri_fem*
Data source: Self-generated
Name of variable in original source: --
Missing observations: 885/3523
Variable description: The gender composition of the candidate's primary election (if the candidate is of a major party)

Frequency distribution/Descriptive statistics:

Variable	Obs	Mean	Std. Dev.	Min	Max
pct_pri_fem	2638	9.855952	16.92083	0	100

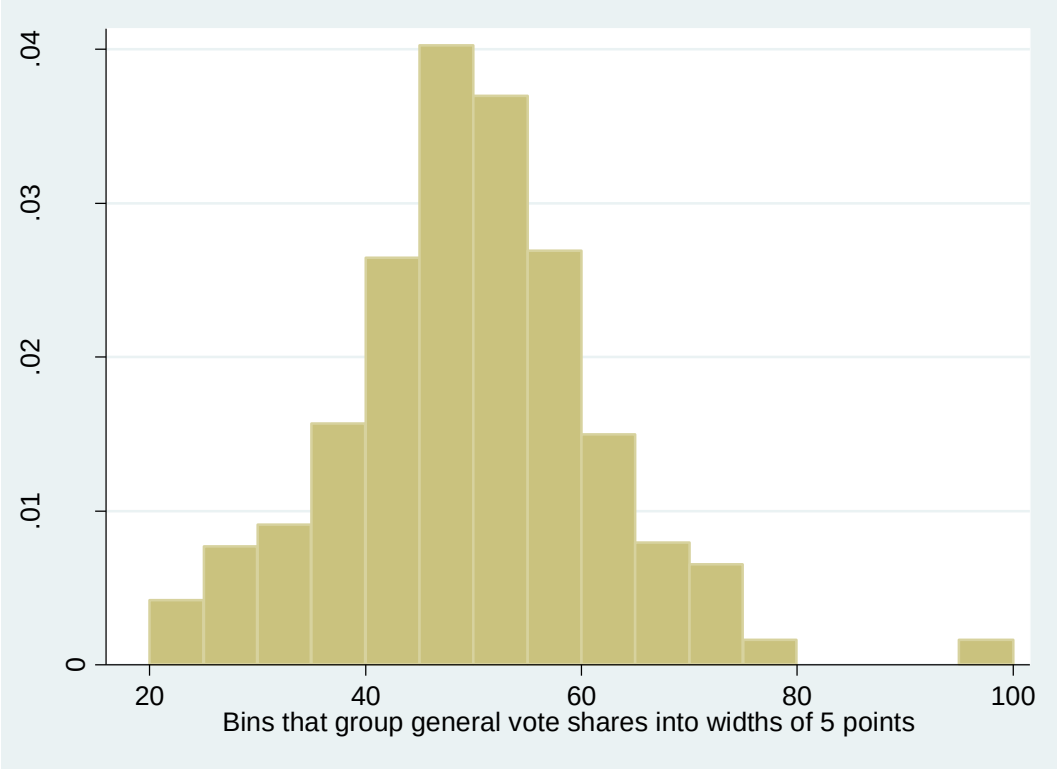
Variable name: *vsbin*
Data source: Generated using Gubernatorial Campaign Expenditures Database
Name of variable in original source: --
Missing observations: 2668/3523
Variable description: Groups general election candidates into bins

Variable values and coding:

20 to 80, where 20 indicates that a candidate received 20 to 24% of the reweighted vote, 25 indicates a candidate received 25 to 29% of the reweighted vote, etc.

Frequency distribution/Descriptive statistics:

Bins that group general vote shares into widths of 5 points	Freq.	Percent	Cum.
20	18	2.11	2.11
25	33	3.86	5.96
30	39	4.56	10.53
35	67	7.84	18.36
40	113	13.22	31.58
45	172	20.12	51.70
50	158	18.48	70.18
55	115	13.45	83.63
60	64	7.49	91.11
65	34	3.98	95.09
70	28	3.27	98.36
75	7	0.82	99.18
100	7	0.82	100.00
Total	855	100.00	



Variable name: *pfswitch*
Data source: CommonCause.org, National Conference of State Legislatures
Name of variable in original source: --
Missing observations: 0/3523
Variable description: Whether a candidate was competing in a state that changed its public funding laws at some point between 1977-2009

Variable values and coding:

0: Candidate was not in a state that changed its public funding laws at some point between 1977-2009
1: Candidate was in a state that changed its public funding laws at some point between 1977-2009

Frequency distribution/Descriptive statistics:

By candidate:

pfswitch	Freq.	Percent	Cum.
0	2,863	81.27	81.27
1	660	18.73	100.00
Total	3,523	100.00	

By general election:

pfswitch	Freq.	Percent	Cum.
0	344	81.13	81.13
1	80	18.87	100.00
Total	424	100.00	

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Table 1: Number of elections by state (1977-2009)

State	Number of elections	State	Number of elections
AK	8	NC	8
AL	8	ND	8
AR	10	NE	8
AZ	8	NH	16
CA	8	NJ	9
CO	8	NM	8
CT	8	NV	8
DE	8	NY	8
FL	8	OH	8
GA	8	OK	8
HI	8	OR	8
IA	8	PA	8
ID	8	RI	12
IL	8	SC	8
IN	8	SD	8
KS	8	TN	8
KY	8	TX	8
LA	8	UT	8
MA	8	VA	9
MD	8	VT	16
ME	8	WA	8
MI	8	WI	8
MN	8	WV	8
MO	8	WY	8
MS	8		
MT	8	*N*	424

Table 2: Number of candidates in a general election

	Freq.	Percent
Did not participate in general election	2,668	75.73
Did participate in general election	855	24.27
N	3,523	100

Table 3: Number of candidates in a general election, by gender

	Male	Female	Unknown	Total
Did not participate in general election	2,299	285	84	2,668
	86.17	10.68	3.15	100
Did participate in general election	766	89	0	855
	89.59	10.41	0	100
N	3,065	374	84	3,523
	87.00	10.62	2.38	100

Frequencies listed above row percentages

Table 4a: Number of candidates by party, primary

	Freq.	Percent
3rd/Ind.	839	23.81
D	1,426	40.48
R	1,258	35.71
N	3,523	100

Table 4b: Number of candidates by party, general

	Freq.	Percent
3rd/Ind.	14	1.64
D	422	49.36
R	419	49.01
N	855	100

Table 5a: Number of candidates by party and by gender, primary

	Male	Female	Unknown	Total
3rd/Ind.	687	114	38	839
	81.88	13.59	4.53	100
	22.41	30.48	45.24	23.81
D	1,233	162	31	1,426
	86.47	11.36	2.17	100
	40.23	43.32	36.9	40.48
R	1,145	98	15	1,258
	91.02	7.79	1.19	100
	37.36	26.2	17.86	35.71
N	3,065	374	84	3,523
	87	10.62	2.38	100
	100	100	100	100

Row percentages listed above column percentages

Table 5b: Number of candidates by party and by gender, general

	Male	Female	Total
3rd/Ind.	13	1	14
	92.86	7.14	100
	1.70	1.12	1.64
D	365	57	422
	86.49	13.51	100
	47.65	64.04	49.36
R	388	31	419
	92.6	7.4	100
	50.65	34.83	49.01
N	766	89	855
	89.59	10.41	100
	100	100	100

Row percentages listed above column percentages

Table 6a: Number of candidates in a given election that received over 20% of the vote

	Freq.	Percent
1	7	1.65
2	403	95.05
3	14	3.30
N	424	100

Table 6b: Gender breakdown in 2 person elections

	Freq.	Percent
1 female vs. 1 female	2	0.50
1 male vs. 1 female	79	19.60
1 male vs. 1 male	322	79.90
N	403	100

Table 7: Distribution of vote shares in 3-person elections

Percentage of vote	Freq.	Percent	Cum.
20 to 24	11	26.19	26.19
25 to 29	7	16.67	42.86
30 to 34	7	16.67	59.52
35 to 39	6	14.29	73.81
40 to 44	6	14.29	88.10
45 to 49	3	7.14	95.24
50 to 54	0	0.00	95.24
55 to 59	2	4.76	100.00
N	42	100	

Table 8a: Incumbent breakdown, contingent on advancing past primary

	Did not participate in general election as incumbent	Participated in general election as incumbent	Total
Challenger	3,266	0	3,266
	100	0	100
Incumbent	18	239	257
	7.00	93.00	100
N	3,284	239	3,523
	93.22	6.78	100

Frequencies listed above row percentages

Table 8b: Incumbent breakdown among general election candidates

	Freq.	Percent
Challenger	616	72.05
Incumbent	239	27.95
N	855	100

Table 9a: Average vote shares for general election candidates, by gender

	Mean vote share	Std. Dev.
Male	49.99	12.19
Female	46.14	9.62

Table 9b: Average vote shares for general election candidates, by gender (excluding third party and independent candidates)

	Mean vote share	Std. Dev.
Male	50.24	11.87
Female	46.39	9.38

Table 9c: Average vote shares for general election candidates, by gender and party

	3rd/Ind.	D	R
Male	35.83	51.11	49.41
	20.61	12.17	11.53
Female	24.03	47.95	43.52
		8.02	11.04

Standard deviations listed below means

Table 10a: Average vote shares for candidates in 1 male vs. 1 female general elections, by gender

	Mean vote share	Std. Dev.
Male	52.62	8.53
Female	47.38	8.53

Table 10b: Average vote shares for candidates in 1 male vs. 1 female general elections, by gender and party

	D	R
Male	55.32	51.29
Female	48.71	44.68

Table 11: Average vote shares for candidates in 1 male vs. 1 female elections, by open vs. non-open election

	One candidate was an incumbent	Neither candidate was an incumbent
Male	53.52	51.59
Female	46.48	48.41

Table 12a: Average vote shares for candidates in 1 male vs. 1 female general elections, by incumbency

	Mean vote share	Std. Dev.
Non-Incumbent	46.77	7.21
Incumbent	58.91	6.82

Table 12b: Average vote shares for candidates in 1 male vs. 1 female general elections, by incumbency and gender

	Challenger	Incumbent
Male	42.92	60.04
	6.27	7.01
Female	39.96	57.08
	7.01	6.27

Standard deviations reported below means

Table 12c: Average vote shares for candidates in 1 male vs. 1 female general elections, by incumbency, gender, and party

	Democratic challenger	Republican challenger	Democratic incumbent	Republican incumbent
Male	41.83	43.41	61.51	58.58
Female	41.42	38.49	56.59	58.17

Table 13a: Average vote shares for candidates in 1 male vs. 1 female general elections, by public funding

	No public funding law in effect	Public funding law in effect
Male	52.72	52.33
Female	47.28	47.67

Table 13b: Average vote shares for candidates in 1 male vs. 1 female general elections, by public funding and incumbency

	One candidate was an incumbent		Neither candidate was an incumbent	
	No public funding law in effect	Public funding law in effect	No public funding law in effect	Public funding law in effect
Male	53.99	52.33	51.36	52.33
Female	46.01	47.67	48.64	47.67

Table 14a: Female vote shares over time

	(1) Female vote share	(2) Female vote share	(3) Female vote share	(4) Female vote share	(5) Female vote share	(6) Female vote share
Time	0.223	0.208	0.221	-1.355*	-2.342**	-2.020**
	(1.69)	(1.12)	(1.26)	(-2.19)	(-3.14)	(-2.72)
Democrat			5.949*			4.355
			(2.43)			(1.91)
$Time^2$				0.0411*	0.0687**	0.0603**
				(2.60)	(3.51)	(3.09)
Constant	42.78***	43.10***	38.83***	55.73***	62.91***	57.36***
	(14.81)	(10.94)	(9.43)	(9.77)	(9.47)	(8.13)
State fixed effects	No	Yes	Yes	No	Yes	Yes
Implied turning point	--	--	--	1992	1993	1993
R^2	0.036	0.480	0.547	0.115	0.602	0.6362
Prob>F	0.095	0.269	0.035	0.010	0.003	0.002
N	79	79	79	79	79	79

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 14b: Female vote shares over time (raw vote shares, including candidates that received between 5% and 20% of the vote)

	(1) Raw female vote share	(2) Raw female vote share	(3) Raw female vote share	(4) Raw female vote share	(5) Raw female vote share	(6) Raw female vote share
Time	0.149	0.130	0.202	-1.702	-2.105	-1.722
	(0.77)	(0.54)	(0.94)	(-1.76)	(-1.77)	(-1.59)
$Time^2$				0.0476	0.0580	0.0499
				(1.96)	(1.92)	(1.81)
Republican			16.88**			17.58**
			(3.13)			(3.31)
Democrat			21.45***			20.75***
			(4.26)			(4.19)
Constant	38.00***	38.38***	18.26**	53.50***	56.87***	34.37**
	(9.10)	(7.51)	(2.71)	(5.99)	(5.24)	(3.10)
State fixed effects	No	Yes	Yes	No	Yes	Yes
Implied turning point	--	--	--	1994	1994	1993
R^2	0.006	0.388	0.533	0.044	0.424	0.558
Prob>F	0.442	0.590	0.001	0.114	0.144	0.001
N	100	100	100	100	100	100

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 14c: Yearly average of female vote shares over time

	(1) Female vote share (yearly average)	(2) Female vote share (yearly average)
Time	-0.283	-2.305**
	(-1.34)	(-2.91)
$Time^2$		0.0585*
		(2.63)
Constant	48.70***	61.99***
	(11.56)	(9.92)
State fixed effects	No	No
Implied turning point	--	1996
R^2	0.091	0.353
Prob>F	0.196	0.025
N	20	20

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 15: Effects of public funding on female vote share

	(1) Fem. vote shr.	(2) Fem. vote shr.	(3) Fem. vote shr.	(4) Fem. vote shr.	(5) Fem. vote shr.	(6) Fem. vote shr.	(7) Fem. vote shr.	(8) Fem. vote shr.	(9) Fem. vote shr.
Public funding	0.389	0.477	-5.826	-26.85	-0.970	-6.220	-25.45		
	(0.18)	(0.14)	(-1.35)	(-0.91)	(-0.42)	(-1.30)	(-2.91)		
Democrat		3.777							
		(1.49)							
Public funding*Dem		1.917							
.		(0.43)							
Male incumbent					-9.628***	-8.238	-25.76		
					(-5.31)	(-1.14)	(-6.38)		
Female incumbent					7.851***	3.267	-1.286		
					(3.79)	(0.69)	(-0.33)		
Public funding* male incumbent					4.033	2.033	-9.705		
					(1.18)	(0.24)	(-1.15)		
Public funding* female incumbent					3.314	14.13	-13.70		
					(0.80)	(1.96)	(-1.24)		
Partial funding								-0.137	-7.456
								(-0.06)	(-1.49)
Full funding								2.624	-3.382
								(0.59)	(-0.60)
Constant	47.28***	44.48***	53.29***	72.21	48.64***	52.68***	18.47	47.28***	53.29***
	(41.94)	(20.40)	(16.56)	(0.24)	(42.92)	(14.62)	(0.41)	(41.76)	(16.28)
State FE	No	No	No	Yes	No	No	Yes	No	No
Time FE	No	No	No	Yes	No	No	Yes	No	No
State-time interaction	No	No	No	Yes	No	No	Yes	No	No
Restricted sample	No	No	Yes	No	No	Yes	No	No	Yes
R^2	0.000	0.058	0.102	0.944	0.538	0.683	0.999	0.005	0.129
Prob>F	0.859	0.210	0.196	0.639	0.000	0.009	0.181	0.834	0.354
N	79	79	18	79	79	18	79	79	18

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16a: Number of incumbents, by gender

	Non-incumbent	Incumbent	Total
Male	2,841	224	3,065
	92.69	7.31	100.00
	88.81	93.33	89.12
Female	358	16	374
	95.72	4.28	100.00
	11.19	6.67	10.88
N	3,199	240	3,439
	93.02	6.98	100.00
	100.00	100.00	100.00

Row percentages listed above column percentages

Table 16b: Number of open elections, by whether general election feature a female

	Non-open election	Open election	Total
No female in general election	195	142	337
	57.86	42.14	100
	81.59	76.76	79.48
Female in general election	44	43	87
	50.57	49.43	100
	18.41	23.24	20.52
N	239	185	424
	56.37	43.63	100
	100	100	100

Row percentages listed above column percentages

Table 16c: Effects of open elections on female vote share

	(1) Female vote share	(2) Female vote share	(3) Female vote share	(4) Female vote share	(5) Female vote share	(6) Female vote share	(7) Female vote share	(8) Female vote share	(9) Female vote share
Open	1.927	3.958	6.452	2.102	3.929	6.576	-7.998***	-3.434	-3.817
	(1.00)	(1.53)	(1.32)	(1.15)	(1.73)	(1.48)	(-4.40)	(-1.37)	(-0.83)
Democrat			7.187*			5.455			1.763
			(2.15)			(1.76)			(0.63)
Open*Dem.			-4.900			-4.491			0.235
			(-0.94)			(-0.94)			(0.06)
Time				-1.391*	-2.288**	-1.940*	-0.497	-0.937	-0.865
				(-2.25)	(-3.14)	(-2.61)	(-1.07)	(-1.39)	(-1.26)
$Time^2$				0.0420**	0.0677**	0.0591**	0.0159	0.0278	0.0261
				(2.66)	(3.54)	(3.03)	(1.33)	(1.53)	(1.40)
Male incumbent							-16.13***	-12.57***	-12.07***
							(-8.19)	(-4.42)	(-3.92)
Constant	46.48***	45.53***	41.34***	55.09***	60.42***	54.12***	59.11***	59.18***	57.29***
	(35.31)	(29.67)	(16.47)	(9.63)	(9.10)	(7.24)	(14.07)	(10.81)	(8.96)
State fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
R^2	0.013	0.493	0.550	0.130	0.641	0.660	0.544	0.756	0.762
Prob>F	0.320	0.134	0.075	0.015	0.002	0.004	0.000	0.000	0.000
N	79	79	79	79	79	79	79	79	79

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16d: Effects of open elections on male vote share

	(1) Male challenger vote share	(2) Male challenger vote share
Open	8.639***	8.461***
	(8.50)	(7.67)
Time	-0.109	-0.150
	(-0.49)	(-0.66)
$Time^2$	0.00139	0.00250
	(0.21)	(0.37)
Constant	42.82***	43.18***
	(27.62)	(27.28)
State fixed effects	No	Yes
R^2	0.190	0.318
Prob>F	0.000	0.000
N	322	322

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17a: Effects of public funding on female participation

	(1) Percent of primary candidates female	(2) Percent of primary candidates female	(3) Number of female primary candidates	(4) Number of female primary candidates
Public funding	1.976	-1.066	0.0401	-0.113
	(1.12)	(-0.29)	(0.81)	(-1.12)
Time	0.295***	0.298***	0.00496*	0.00547*
	(3.83)	(3.77)	(2.30)	(2.53)
Democrat	5.081***	5.049***	0.148***	0.146***
	(3.58)	(3.57)	(3.73)	(3.78)
Constant	1.819	2.407	0.137**	0.161***
	(1.12)	(1.44)	(3.02)	(3.54)
State fixed effects	No	Yes	No	Yes
R^2	0.034	0.099	0.024	0.131
Prob>F	0.000	0.000	0.000	0.000
N	842	842	842	842

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17b: Effects of open elections on female participation

	(1) Percent of primary candidates female	(2) Percent of primary candidates female	(3) Number of female primary candidates	(4) Number of female primary candidates
Open primary	1.018	1.206	0.135**	0.132**
	(0.66)	(0.77)	(3.13)	(3.10)
Time	0.303***	0.293***	0.00510*	0.00488*
	(3.95)	(3.81)	(2.39)	(2.34)
Democrat	5.110***	5.084***	0.152***	0.150***
	(3.60)	(3.60)	(3.85)	(3.90)
Constant	1.364	1.419	0.0468	0.0536
	(0.70)	(0.72)	(0.86)	(1.01)
State fixed effects	No	Yes	No	Yes
R^2	0.033	0.099	0.034	0.140
Prob>F	0.000	0.000	0.000	0.000
N	842	842	842	842

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17c: Effects of open elections and public funding on the probability of a female appearing in a general election

	(1) Female in election	(2) Female in election	(3) Female in election	(4) Female in election	(5) Female in election	(6) Female in election
Open	0.194	0.274			0.207	0.271
	(1.36)	(1.58)			(1.44)	(1.57)
Time	0.0386***	0.0481***	0.0368***	0.0466***	0.0372***	0.0471***
	(4.74)	(5.10)	(4.52)	(4.80)	(4.54)	(4.81)
Public funding			0.259	0.154	0.273	0.131
			(1.53)	(0.42)	(1.61)	(0.36)
Constant	-1.598***	-0.977	-1.536***	-0.745	-1.640***	-0.959
	(-8.75)	(-1.91)	(-9.14)	(-1.53)	(-8.88)	(-1.87)
State fixed effects	No	Yes	No	Yes	No	Yes
Pseudo R^2	0.059	0.149	0.060	0.143	0.065	0.149
Prob>chi^2	0.000	0.035	0.000	0.054	0.000	0.042
N	424	328	424	328	424	328

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Coefficients represent marginal effects at the average of each independent variable.

Table 17d: Effects of open elections and public funding on the probability of a female Democrat in a general election

	(1) Democratic female in election	(2) Democratic female in election	(3) Democratic female in election	(4) Democratic female in election	(5) Democratic female in election	(6) Democratic female in election
Open	0.341*	0.581**			0.340*	0.587**
	(2.15)	(2.95)			(2.14)	(2.97)
Time	0.0352***	0.0431***	0.0348***	0.0430***	0.0356***	0.0450***
	(3.89)	(4.09)	(3.85)	(4.03)	(3.90)	(4.07)
Public funding			-0.0756	-0.198	-0.0666	-0.265
			(-0.38)	(-0.47)	(-0.33)	(-0.61)
Constant	-1.905***	-2.461***	-1.717***	-1.963**	-1.899***	-2.506***
	(-9.07)	(-3.60)	(-9.13)	(-3.05)	(-8.99)	(-3.63)
State fixed effects	No	Yes	No	Yes	No	Yes
Pseudo R^2	0.060	0.132	0.047	0.103	0.061	0.134
Prob>chi	0.000	0.345	0.000	0.743	0.000	0.373
N	424	303	424	303	424	303

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Coefficients represent marginal effects at the average of each independent variable.

Table 17e: Effects of open elections and public funding on the probability of a female Republican in a general election

	(1) Republican female in election	(2) Republican female in election	(3) Republican female in election	(4) Republican female in election	(5) Republican female in election	(6) Republican female in election
Open	-0.0261	-0.210			0.0111	-0.212
	(-0.14)	(-0.84)			(0.06)	(-0.84)
Time	0.0220*	0.0309*	0.0188	0.0300*	0.0189	0.0300*
	(2.07)	(2.29)	(1.75)	(2.09)	(1.75)	(2.10)
Public funding			0.532**	0.0699	0.533**	0.0819
			(2.63)	(0.16)	(2.62)	(0.19)
Constant	-1.832***	-0.663	-1.934***	-0.810	-1.940***	-0.646
	(-7.83)	(-1.23)	(-8.64)	(-1.57)	(-8.03)	(-1.18)
State fixed effects	No	Yes	No	Yes	No	Yes
Pseudo R^2	0.020	0.099	0.050	0.095	0.050	0.099
Prob>chi	0.106	0.797	0.004	0.831	0.011	0.837
N	424	181	424	181	424	181

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Coefficients represent marginal effects at the average of each independent variable.

Table 18a: Existence of spending information for 1 male vs. 1 female gubernatorial elections

Year	State	Spending data?
1978	CT	Yes
1982	IA	Yes
1982	VT	Yes
1986	CT	Yes
1986	NV	Yes
1986	VT	Yes
1988	VT	Yes
1990	KS	Yes
1993	VA	Yes
1994	MD	Yes
1994	RI	Yes
1996	DE	Yes
1996	WA	Yes
1998	CO	Yes
1998	CT	Yes
1998	MD	Yes
1998	NH	Yes
1998	NV	Yes
1998	OK	Yes
1998	RI	Yes
1998	SD	Yes
1998	VT	Yes
2000	ND	Yes
2000	VT	Yes
2002	AK	Yes
2002	AR	Yes
2002	AZ	Yes
2002	KS	Yes
2002	MD	Yes
2002	MI	Yes
2002	RI	Yes
2003	LA	Yes
2004	DE	Yes
2004	MO	Yes
2004	WA	Yes
2006	AK	Yes
2006	AL	Yes
2006	AZ	Yes
2006	CT	Yes
2006	HI	Yes
2006	IL	Yes
2006	KS	Yes
2006	MA	Yes
2006	MI	Yes
2006	NV	Yes
2008	IN	Yes
2008	NC	Yes
2008	WA	Yes
N		48

Year	State	Spending data?
1983	KY	No
1984	VT	No
1986	AK	No
1986	OR	No
1988	MO	No
1990	CA	No
1990	NE	No
1990	OR	No
1990	PA	No
1990	TX	No
1990	WY	No
1992	MT	No
1992	NH	No
1992	RI	No
1993	NJ	No
1994	CA	No
1994	IA	No
1994	IL	No
1994	TX	No
1994	WY	No
1996	MO	No
1996	NH	No
1996	WV	No
1997	NJ	No
1998	AZ	No
1998	HI	No
1999	KY	No
2000	DE	No
2000	MT	No
2000	NH	No
2002	MA	No
N		31

Table 18b: Effects of spending on female vote shares

	(1) Female vote share	(2) Female vote share	(3) Female vote share	(4) Female vote share	(5) Female vote share	(6) Female vote share
Log of female total campaign spending	2.350	6.315*	4.540***	6.352*		
	(1.96)	(2.82)	(3.74)	(2.83)		
Log of male total campaign spending			-2.882**	-1.758		
			(-3.52)	(-1.35)		
Female's share of total spending					21.53***	18.25
					(3.84)	(2.02)
Constant	13.52	-45.24	23.57	-19.99	37.90***	39.46***
	(0.76)	(-1.36)	(1.46)	(-0.57)	(13.19)	(8.88)
State fixed effects	No	Yes	No	Yes	No	Yes
R^2	0.076	0.644	0.284	0.692	0.243	0.628
Prob>F	0.056	0.010	0.001	0.029	0.000	0.057
N	48	48	48	48	48	48

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 18c: Effects of spending on female vote shares (continued)

	(1) Female vote share	(2) Female vote share	(3) Female vote share	(4) Female vote share
Log of female total campaign spending	-1.131	-1.876		
	(-0.30)	(-0.47)		
Log of male total campaign spending	-0.885	-0.645		
	(-0.79)	(-0.54)		
Male incumbent	-58.26	-56.26	-25.21**	-24.60**
	(-0.87)	(-0.82)	(-3.32)	(-3.16)
Female incumbent	-32.77	-13.50	-3.146	-3.012
	(-0.46)	(-0.17)	(-0.33)	(-0.31)
Log of female spending* male incumbent	3.380	3.273		
	(0.76)	(0.72)		
Log of female spending* female incumbent	2.598	1.351		
	(0.56)	(0.27)		
Female's share of total spending			-18.89	-19.14
			(-1.54)	(-1.53)
Female's share of total spending* male incumbent			38.34*	37.29*
			(2.45)	(2.33)
Female's share of total spending* female incumbent			20.15	19.88
			(1.22)	(1.18)
Time		0.140		0.0873
		(0.67)		(0.65)
Constant	80.05	84.03	59.19***	57.24***
	(1.29)	(1.32)	(9.16)	(7.91)
State fixed effects	Yes	Yes	Yes	Yes
R^2	0.883	0.887	0.909	0.912
Prob>F	0.001	0.002	0.000	0.000
N	48	48	48	48

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

FIGURES

Figure 1: Number of elections by year

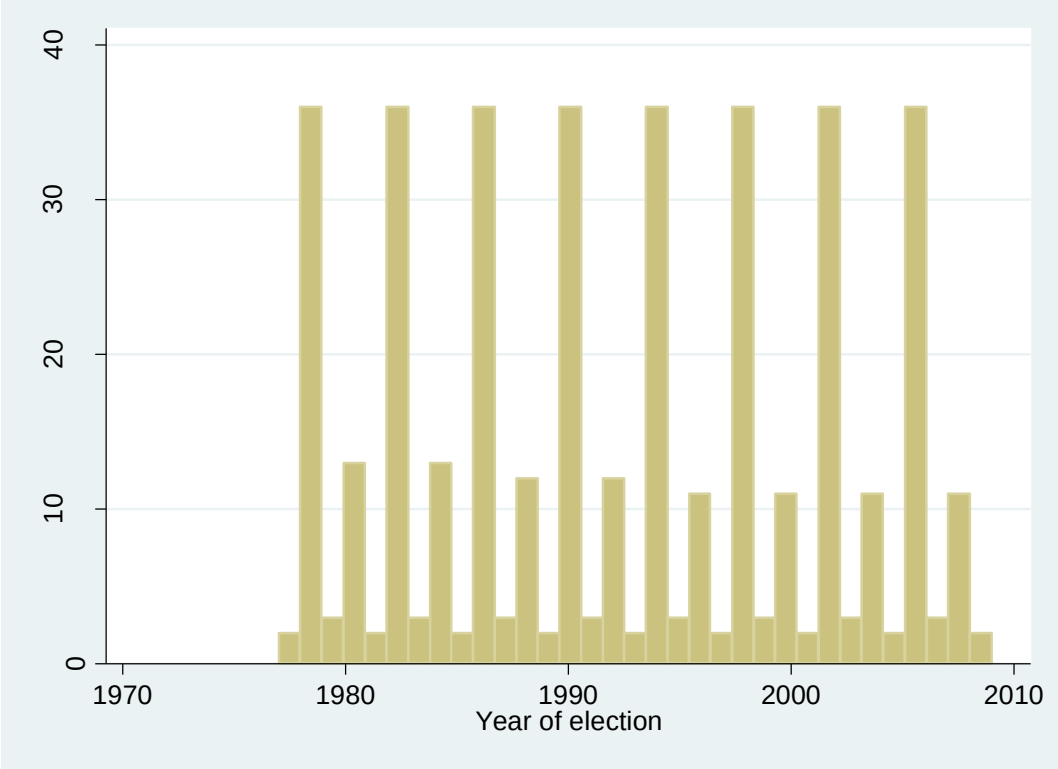

Figure 2: Residuals from female vote share regressed on time

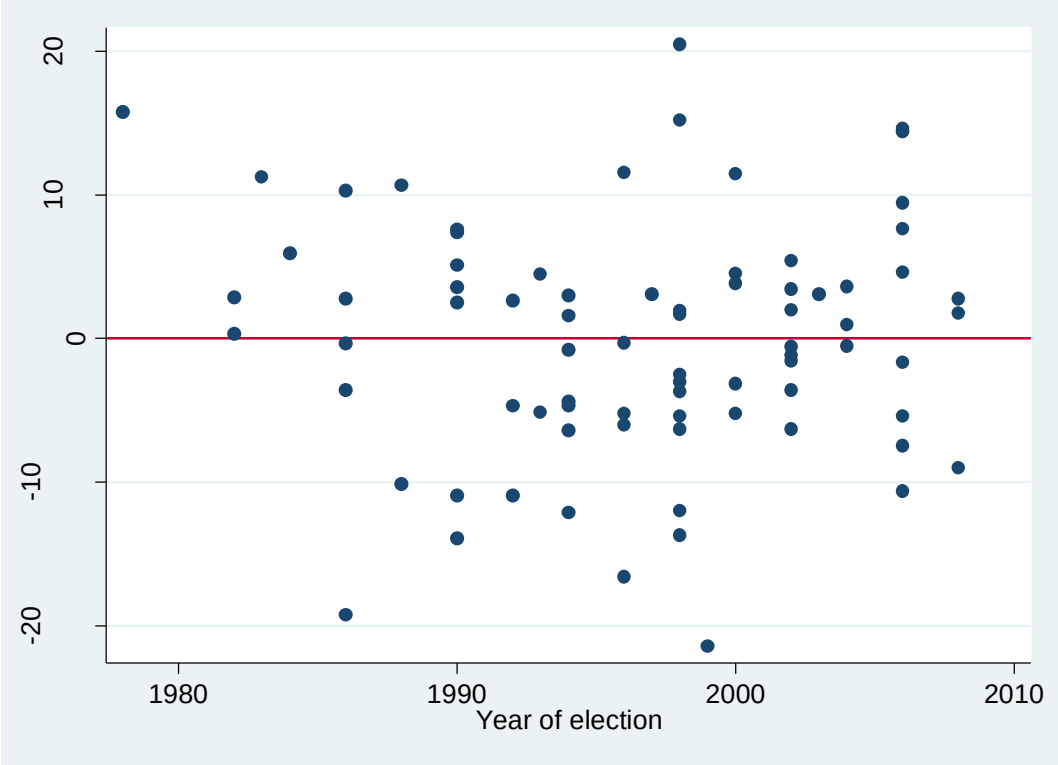

Figure 3: Residuals from female vote share regressed on time, with state fixed effects

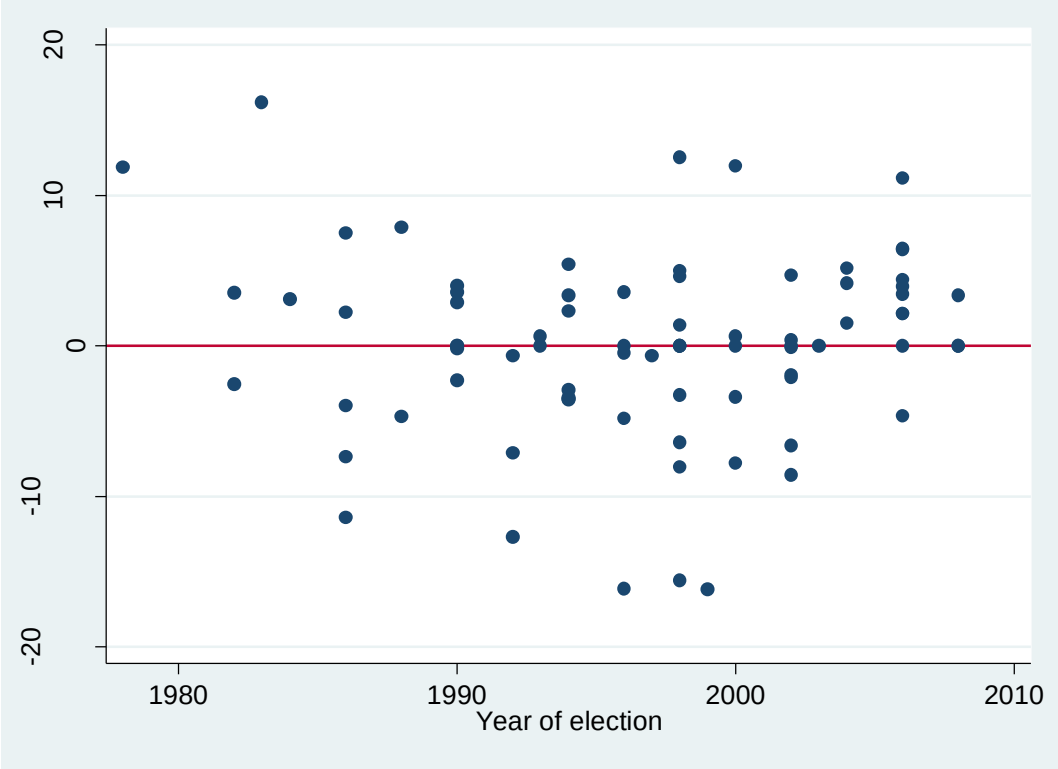

Figure 4: Female raw vote share over time

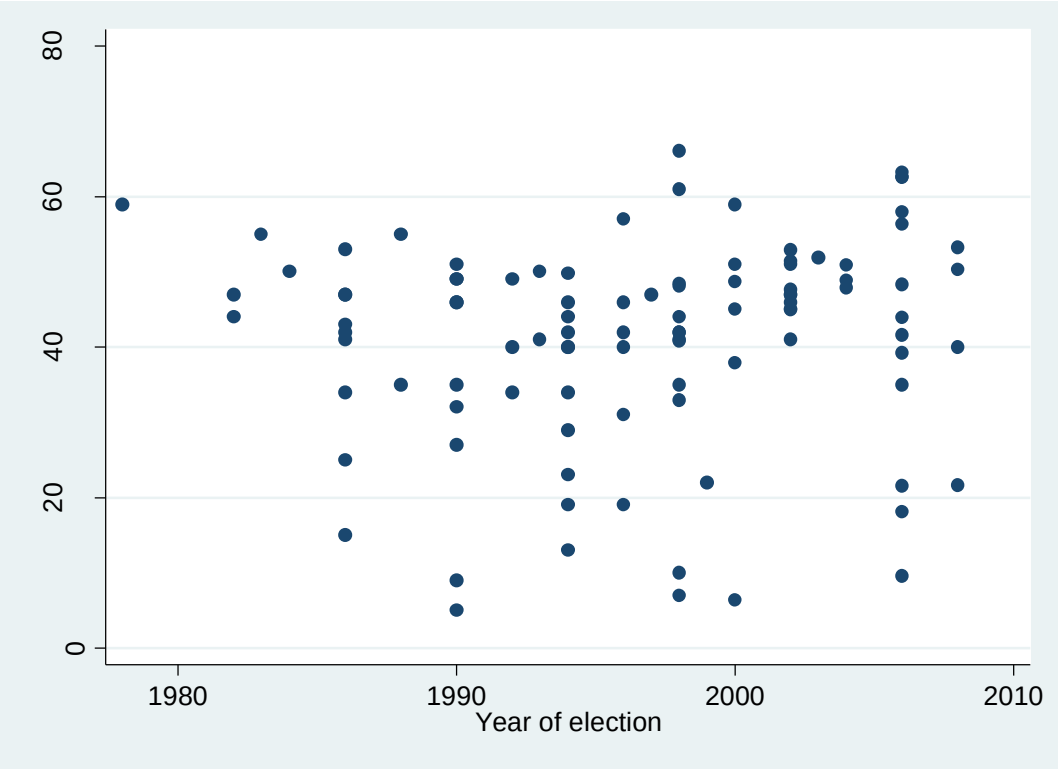

Figure 5: Yearly average of female raw vote share over time

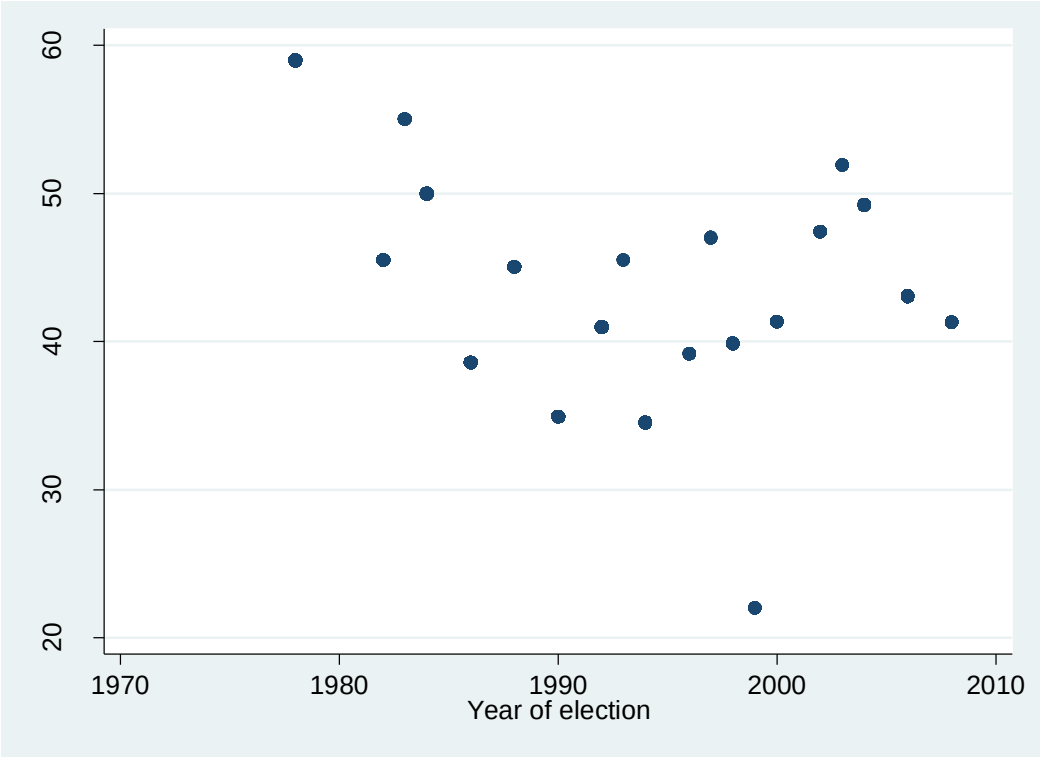

Figure 6: Proportion of general elections featuring a female candidate over time (4 year moving average)