# The Jackie (and Jill) Robinson Effect:
## Why Do Congresswomen Outperform Congressmen?

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This Draft: May 24, 2010

**Abstract**: We argue that the process of selection into political office is different for women than it is for men, which results in important differences in the performance of male and female legislators once they are elected. If voters are biased against female candidates, only the most talented, hardest working female candidates will succeed in the electoral process. Furthermore, if women perceive there to be sex discrimination in the electoral process, or if they underestimate their qualifications for office relative to men, then only the most qualified, politically ambitious females will emerge as candidates. We argue that when either or both forms of sex-based selection are present, *the women who are elected to office* will perform better, on average, than their male counterparts. We test this central implication of the theory by using legislators' success in delivering federal spending to their home districts as our primary measure of performance. We find that congresswomen secure roughly 9 percent more spending from federal discretionary programs than congressmen. This amounts to a premium of about $49 million per year for districts that send a woman to Capitol Hill. Finally, we find that women's superiority in securing particularistic benefits does not hurt their performance in policymaking: women also sponsor and cosponsor more bills per congress than their male colleagues.

Women are a minority in legislatures across the U.S. In 2010, women hold only 17 percent of the seats in each chamber of Congress and 24.3 percent in state legislatures (CAWP 2009). Granted, women have made advances in politics in recent decades, but even today, 11 percent of American adults openly admit that they would not vote for a woman for president (Newport and Carroll 2007). Moreover, qualified women express greater hesitation about running for office than similarly qualified men (Fox and Lawless 2004).

In this paper, we draw a connection between models of political agency and the economics of discrimination, linking both to the vast literature on women in politics. We propose that the process of selection into office is different for women than it is for men, resulting in important differences in the performance of male and female legislators once they are elected. This phenomenon, which we call "sex-based selection," can occur in one or both of two ways: First, if voters discriminate against female candidates, only the most talented, hardest working female candidates will win elections. Second, if women in the political eligibility pool underestimate their qualifications for office relative to men, or if women perceive there to be sex discrimination in the electoral process, then only the most qualified, politically ambitious females will emerge as candidates. We argue that when either or both forms of sex-based selection are present, *the women who run and win office* will perform better, on average, than their male counterparts. We test this proposition by evaluating the success of congresswomen relative to congressmen in delivering federal dollars to the home district.

The paper proceeds as follows. Section one reviews the related literature. In section two, we describe our sex-based selection theory and its implications for the quality and effectiveness of women in legislatures. Section three details the methods and data we use for the empirical analysis. The fourth section presents the results of a series of empirical tests of the relationship between legislator sex and job performance. Section five concludes.

## 1. Related Research and Background

In the empirical literature on the distribution of federal spending across congressional districts, little has been done to estimate differences in distributive spending by legislator sex. Meanwhile, the literature on legislative productivity has focused almost exclusively on general conditions within the legislature rather than the characteristics of legislators themselves.[1] Within the literature on women in politics, however, there is a great deal of relevant scholarly work.

To start, scholars have amassed evidence that men and women of equal political qualifications do not entertain the possibility of running for office in equal frequencies. Lawless and Fox (2005) find that politically eligible women with the same objective qualifications as men are less likely to consider themselves qualified to run for public office. Moreover, women express greater concern than men about their ability to raise the necessary financial support and win elections (Duerst-Lahti 1998; Fowler and McClure 1989; Fox and Lawless 2004; NWPC 1994). The differences in men and women's political ambition might be the result of differences in male and female socialization, psychology, and personal life circumstances (Burrell 1994). In addition, women's political ambition might be dampened by the perception of sex bias in politics: over 90 percent of women and 75 percent of men in the candidate eligibility pool (e.g., attorneys, business people, educators, and political activists) believe that there is bias against women in elections (Lawless and Fox 2005).

Some scholars have argued that such concerns are unwarranted. One of the most well known findings in the literature on women in politics is that female candidates raise as much money *and* win general elections at the same rate as male candidates (Burrell 1994; Fox 2006; Newman 1994; Seltzer, Newman, and Leighton 1997; Uhlaner and Schlozman 1986). Based on this evidence, many scholars have concluded that discrimination against women in politics is a phenomenon of the past (e.g., Fox 2006, Seltzer et al. 1997, Smith and Fox 2001).

However, a recent Gallup survey showed that 11 percent of both men and women said they

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[1] For important contributions, see Howell, Adler, Cameron, and Riemann (2000) and Clinton and Lipinski (2006).

would not vote for a female presidential candidate even if she were qualified for the job, and another 11 percent said they would vote for a qualified woman only "with reservations" (Newport and Carroll 2007).[2] This almost certainly understates the prevalence of sex bias among voters, since pressure to provide socially desirable responses to public opinion polls likely prevents some respondents from admitting their underlying prejudices, if they are even aware of them (see Fox and Smith 1998). Even so, this figure is more than *double* the percentage of respondents who said they would not vote for a black candidate for president. In an innovative paper, Mahoney (2007) revisits the question of sex bias in elections and finds that candidates with male-sounding first names win an additional 15 percent of the vote in state legislative elections, controlling for the candidates' true sex.

Moreover, a series of experimental studies find that voters *do* harbor bias against female candidates. Rosenwasser and Dean (1989) find that voters prefer "masculine" traits in candidates for all levels of public office, and Huddy and Terkildsen (1993a, 1993b) show that voters' gender stereotypes are most harmful to female candidates running for national office. Fox and Smith (1998) present subjects with a series of hypothetical male and female House candidates and find that significantly fewer subjects choose to vote for female candidates (see also Dolan 1997).[3]

The path to congressional office also presents more hurdles to women than to men. Lawless and Pearson (2008) find that congressional primary elections in which at least one of the candidates is female tend to attract larger numbers of contenders. Also, Palmer and Simon (2006) show that female incumbents are significantly less likely than male incumbents to face uncontested primary and general elections. Similarly, Milyo and Schosberg (2000) find that female candidates are significantly more likely to face high-quality challengers than male candidates. Moreover, political party leaders believe that there is generally more uncertainty about a woman's electability than a man's;

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[2] Due to its timing, the survey might conflate voters' opinions about women with their views on Hillary Clinton's candidacy, but the aggregate responses do not differ dramatically from surveys conducted in the 1990s (Fox and Smith 1998).
[3] There is some evidence that female candidates for the U.S. House actually have an advantage in gaining support from female voters (see Smith and Fox 2001), but conclusions on the subject are mixed (see Philpot and Walton 2007).

hence, they are less likely to recruit women to run for office (Sanbonmatsu 2006). Notably, the women who *do* emerge as congressional candidates tend to have greater political experience than male congressional candidates (Pearson and McGhee 2007).

Another large literature examines the differences between men and women once they are *in* office. There is evidence that female legislators direct more of their attention to policy areas thought of as "women's issues" (e.g., Norton 1999; Thomas 1991; Swers 2002). In addition, the presence of women in legislatures has been shown to influence the nature of policy outcomes (Besley and Case 2003; Chattopadhyay and Duflo 2004; Rehavi 2007). For the most part, however, this literature is not well integrated with work that examines the performance of women in pre-election politics. In the next section, we propose a theory of political selection that connects the performance of women in campaigns and elections with their performance once in office.

## 2. A Theory of Political Selection: The Jackie (and Jill) Robinson Effect

In 1947, Jackie Robinson became the first African American to play Major League Baseball. He is widely revered as one of the greatest players in the history of the game. This is no coincidence. If Robinson could have been easily replaced by a white player, no team would have been willing to take a chance on him, given the widespread bigotry of the time. Robinson *had* to be better than almost any white player in order to overcome the prejudice of owners, players, and fans.[4] Of course, this story is not unique to Robinson. Pascal and Rapping (1972) found that black Major League Baseball players in 1967 outperformed white players in every position. Nor is the story unique to baseball. There is widespread evidence that black athletes have historically faced higher performance standards for entry into professional sports than white athletes (see Kahn 1991). More generally,

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[4] This view is explained by Hank Aaron, himself an African American former ballplayer and erstwhile holder of the major league career home-run record. According to Aaron (1999), "Jackie Robinson had to be bigger than life. He had to be bigger than the Brooklyn teammates who got up a petition to keep him off the ball club, bigger than the pitchers who threw at him or the base runners who dug their spikes into his shin, bigger than the bench jockeys who hollered for him to carry their bags and shine their shoes, bigger than the so-called fans who mocked him with mops on their heads and wrote him death threats."

Becker (1957) pioneered the idea that workers who face discrimination in the labor market must perform better in order to earn the same wage as other workers.[5]

We suggest that a similar performance premium is demanded of female politicians when there is sex discrimination in the electorate.[6] If voters are prejudiced against women, then a woman must be better than the man she runs against in order to win.[7] Moreover, if women anticipate discrimination by voters, or simply underestimate their own qualifications, then only the most formidable women will run for office to begin with. In either case, our prediction that sex-based selection will lead the women in office to perform better, on average, than the men flows naturally from the literature on political agency, which focuses on two issues: moral hazard and selection.

In moral hazard models of elections, originating with Barro (1973) and Ferejohn (1986), the desire to be reelected in the future motivates politicians to exert effort while in office. Citizens vote retrospectively, reelecting the incumbent only if his performance is above a threshold level chosen to maximize the incumbent's incentive to work and hence the voter's ex ante expected utility. Other contributions that focus on elections as sanctioning devices for inducing effort from politicians include Austen-Smith and Banks (1989), Seabright (1996), and Persson, Roland, and Tabellini (1997).

A second body of theory conceives of elections as devices for selecting high-quality politicians, or "good types," into office (e.g., Zaller 1998, Gordon, Huber, and Landa 2007). In this view, voters use information gleaned from campaigns and from incumbents' performance in office as signals about intrinsic characteristics of candidates, such as talent or honesty. Elections select good types and filter out bad types, but they do not alter politicians' behavior in office.

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[5] For a recent survey of the economics of discrimination, see Rodgers (2006).

[6] It may seem that a more obvious analogy is with racial discrimination in politics. However, the use of race-conscious districting confounds the problem. We return to this issue at the end of the paper.

[7] Technically, some voters might reverse discriminate, that is, give preference to female candidates. Our prediction still holds as long as the proportion that discriminates is greater than the proportion that reverse-discriminates. It is worth noting that the greater the level of discrimination by voters, donors, and gatekeepers, the greater should be the observed quality differential for women who win elections. Of course, if discrimination is strong enough, it is possible that no quality advantage will be sufficient to overcome it, in which case we should not observe women winning elections.

There have been attempts to adjudicate between the electoral selection and moral hazard models (e.g., Fearon 1999) as well as attempts to unify them (e.g, Ashworth 2005, Banks and Sundaram 1998, Besley 2006). We do not stake out a position on such issues but rather emphasize that the implications of sex-based selection are the same in either framework. We assume that performance is a function of a candidate's innate ability and her effort. In other words, a candidate will perform better in office if she is more able, works harder, or both. Therefore, if voters discount the ability of female candidates (electoral selection model), or if voters demand a higher performance threshold for women (moral hazard model), then the women *who win* will perform better in office than the men who win, on average. If female candidates anticipate that they will face discrimination in the election or otherwise underestimate their chances for electoral success, the women who *do* run for office will be those who expect to exceed the higher performance threshold demanded by voters.

We note that in order for this prediction to hold, the attributes that make someone a high quality candidate must be related to the attributes that make her a high quality legislator. If the two were uncorrelated, then we would not expect to observe a difference between the performance of male and female legislators in office. However, as long as candidate quality and legislator quality are based on similar traits, the process of sex-based selection should result in a legislature in which the average female representative outperforms the average male representative.

Importantly, our theory of sex-based selection can accommodate two apparently conflicting strands of evidence from the existing literature discussed above. On one hand, scholars who have examined female candidates' vote totals and success rates in House general elections have found that they do just as well as male candidates (e.g., Burrell 1994). On the other hand, a sizeable proportion of voters are biased against female candidates in state legislative elections (Mahoney 2007), in presidential elections (e.g., Newport and Carroll 2007), and in hypothetical House election candidate match-ups (Fox and Smith 1998). Our theory shows that there is no inconsistency between these

sets of findings. If only higher-quality female candidates will actually run for office, then we would not necessarily expect to observe a vote or campaign funding differential between male and female candidates even if there is, in fact, discrimination by voters and donors. Yet, if the average female candidate is of higher quality than the average male candidate but receives the same amount of funding and wins the same number of votes, she is clearly not on equal footing with the man.[8] Therefore, existing studies that compare women's and men's vote shares are not directly informative about the presence or absence of discrimination by voters, since the workings of the candidate selection stage might mask the presence of voter discrimination at the electoral stage.

Theory aside, the existing evidence suggests that both female self-selection on quality *and* voter discrimination are at work. If the average woman running for office were of higher quality than the average man and voters did not discriminate, then we should observe female candidates winning at higher rates than men. But they do not. If voters discriminate but women do not self-select based on quality—implying that the average female candidate is equal in quality to the average male—then we should see women losing more often than men. But they do not. If the two occur in combination, such that voters discriminate against female candidates and female candidates self-screen in anticipation of that discrimination, we would observe fewer but more qualified women running for office and possibly equal electoral success rates for male and female candidates. This last set of circumstances is the one most consistent with existing empirical evidence (Pearson and McGhee 2007). Importantly, however, our theoretical prediction holds regardless of whether discrimination by voters occurs alone or in combination with self-screening by candidates: in either

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[8] Again, we find an analogous situation in professional sports. On average, black players in the NBA earn salaries equal to those of white players. Some see this pay parity as evidence that discrimination has been overcome. Others suggest that black players are better on average than white players and that salary equality is evidence of discrimination rather than its absence. See Kahn and Sherer (1988).

case, the women *who run and win* will perform better, on average, than the men who run and win.[9]

We emphasize that we are *not* arguing that women have more innate political talent than men, nor do we claim that all female candidates outperform their male counterparts. Our theory simply identifies a connection between the economics of discrimination and models of political agency: when sex discrimination is present among voters, women must be better than their male counterparts to be elected. If women anticipate such discrimination, or if they underestimate their chances for electoral success, then only the most qualified women will run in the first place. There-fore, on average, the women we observe in office will perform better than the men, all else equal.

## 3. Empirical Strategy and Data

As our primary measure of a legislator's performance, we look to her success in delivering federal program spending to her home district. The use of spending as an indicator of incumbent performance has strong empirical and theoretical foundations. Empirically, congressional scholars have long observed that a fundamental and explicit goal of members is to bring home federal dol-lars, and this observation has been a central theme in the classics on Congress (Fenno 1966, 1978; Ferejohn 1974; Fiorina 1981; Mayhew 1974). There is evidence that such efforts bolster an incum-bent's reelection prospects (Alvarez and Saving 1997; Bickers and Stein 1996; Levitt and Snyder 1997; Sellers 1997; Stein and Bickers 1995). Moreover, members of Congress themselves appear to believe that they must serve their constituents through both casework and project work to build the reputation necessary for future electoral success (Cain, Ferejohn, and Fiorina 1987).

There is also a strong theoretical motivation for using district spending as an indicator of leg-islator performance. In particular, Ashworth (2005) presents a model in which reelection-minded incumbents face a fundamental tradeoff between allocating their resources toward producing dis-

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[9] There is, of course, another scenario to consider. In the case that there is no discrimination by voters and potential female candidates do not self-screen, we would expect that female candidates would win at rates equal to male candi-dates and that there would be no performance premium on the part of female politicians.

trict-specific benefits, such as federal program spending, or national public goods, such as legislation or bureaucratic oversight. Voters learn about the ability of incumbents by observing two signals, which are a function of the politician's effort on the two tasks, and reelect those politicians whom they believe are of high ability. A central result from Ashworth's model is that politicians have an incentive to bias their effort toward tasks that voters observe with less noise. This logic favors the dedication of effort to securing district-specific projects, which are more informative signals of the incumbent's ability than are national public goods and hence receive greater weight when voters update their beliefs. In other words, it is the *observability* of program spending that makes it the most efficient pathway for politicians to signal their quality to constituents.

With these empirical and theoretical motivations, we adopt the not unfamiliar assumption that legislators are universally motivated to direct projects and funding to their districts (e.g., Evans 2004). Furthermore, while some program spending is formulaic, we assume that a representative's talent and effort play an important role in the logrolling, agenda setting, coalition building, and other deal-making activities that characterize distributive politics. Of two legislators who come from districts with similar characteristics (or who represent the same district at different times), the one who succeeds in directing more spending to her district can be deemed to have performed better in the context of this fundamental political pursuit. Of course, we recognize that delivering federal benefits to the home district is only one aspect of a legislator's job. Therefore, we round out our analysis of legislative performance by examining legislators' bill sponsorship and cosponsorship activity.

*3.1 Federal Outlays Data*

To compare federal program spending in congressional districts represented by men and women in the U.S. House of Representatives, we use data from the Federal Assistance Award Data System (FAADS).[10] FAADS is a comprehensive source for federal domestic spending programs and

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[10] See Appendix A for a detailed description of the data.

reports expenditures of about 1,000 programs, including agricultural programs, education grants, research grants, large entitlement programs, and many others.[11]  We aggregated the FAADS records to produce a data set that includes 9135 federal outlays observations for congressional district and fiscal year combinations, tracking approximately $20.8 trillion in federal expenditures from 1984 to 2004 (in 2004 dollars). We attribute the federal outlays for each fiscal year to the member of Congress who represented the congressional district in the calendar year prior.

Congressional district boundaries are redrawn every ten years due to decennial reapportionment and redistricting, and therefore we had to trace districts over time in constructing our panel. After a decennial redistricting, some districts remain essentially intact while others change beyond recognition. We consider a district to be a continuous entity across redistricting periods if the majority of the land area of the post-redistricting district is made up of pre-redistricting district land area. Otherwise, when we could not match a new district clearly to a pre-existing district, the new district is treated as a new unit following the decennial redistricting. Consequently, the panel includes 733 unique district entities over the 21-year time period.[12]

FAADS reports award transactions and recipient congressional districts according to the initial recipient. This poses a problem for awards made to states for redistribution throughout the state: FAADS grossly inflates federal outlays to the congressional districts that contain state capitol buildings. We improve a bit upon Levitt and Snyder's (1995) treatment of this issue by including a control variable equal to the fraction of the state capitol county contained in each congressional district, weighted by the state population.[13]  More importantly, we include district fixed effects, as explained below, which control for time-invariant factors, such as being part of the state capitol county.

Finally, we note that the FAADS data include a great deal of federal spending by broad-

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[11] The major omission is defense:  military spending and defense procurement programs are not included.
[12] The results presented in the following pages are not highly sensitive to the land area threshold used for matching districts across years. See Appendix A.
[13] Details are provided in Appendix A. We transform this variable to a natural log.

based entitlement programs, such as Social Security and Medicaid, the distributions of which are de-termined by formula. It hardly seems appropriate to attribute this kind of spending to the political skill and effort of a district's representative. In order to separate broad-based entitlement programs from programs that represent discretionary spending, we adopt a tactic used by Levitt and Snyder (1995, 1997). Specifically, we calculate coefficients of variation in district-level spending for each program contained in the FAADS data and use the coefficients to separate programs into two cate-gories: *low variation* programs have coefficients of variation less than 3/4, and *high variation* programs have coefficients of variation greater than or equal to 3/4.[14] The low variation category includes 26 programs, most of which are programs within the Veterans Benefits Administration, the Centers for Medicare & Medicaid Services, and the Social Security Administration, which make up 76 percent of the spending in our data. The high variation category comprises hundreds of smaller programs. In the analysis that follows, we examine spending from high variation programs only, in expectation that legislator ability and effort play a larger role in the distribution of high variation spending.[15]

We adjust the spending data to 2004 dollars. The mean value of district-level high variation program outlays ranges from $398 million in 1984 to $753 million 2003. The median value increases from $151 million to $361 million. Of the 9135 congressional district and fiscal year combinations, 8307 observations represent annual outlays to districts led by male legislators, and the remaining 828 are for women-led districts. There are 112 unique women in the dataset. Thirty-eight states had at least one female member of Congress during this time period. Of the 733 unique districts we ob-serve across the three redistricting plans, 133 had a female representative for at least one congress.

*3.2 Identification Strategy*

For our main analysis, we use a differences-in-differences approach, based on district and year fixed effects, to identify the effect of having a female representative on a district's receipt of

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[14] We also tried four thresholds greater than 3/4, none of which produced notably different results. See Appendix A.
[15] See Appendix B for a discussion of results using spending from low variation federal programs.

federal program outlays. Essentially, we ask whether a district receives more federal spending during the years in which it sends a woman to Washington compared to the years when it sends a man. Because we rely on variation within districts over time for identification, we can eliminate any (observable or unobservable) time-invariant attributes of a district that could influence both the likelihood of electing a woman and the flow of federal spending. Importantly, the district fixed effects also subsume time-invariant heterogeneity across states, such as the well known result that smaller states receive greater federal outlays, on a per capita basis, due to malapportionment in the Senate (e.g., Lee 1998). We specify the following basic model:

$$\ln(\text{outlays}_{it}) = \beta_0 + \beta_1(F_{it}) + \delta_t + \psi\mathbf{X}_{it} + \varrho\mathbf{Z}_{it} + \alpha_i + \varepsilon_{it},$$

where subscript $i$ denotes congressional districts and $t$ denotes time. The variable of interest is $F_{it}$, which is a binary indicator variable coded one if the person representing district $i$ at time $t$ is female, zero if male. We include year indicators, $\delta_t$, to control for general changes in spending over time.

The vector $\mathbf{X}_{it}$ denotes other legislator characteristics that may influence spending. We control for party, which is expected to account for the traditional Republican preference for fiscal conservatism which conceivably tempers the push for more spending to the home district.[16] In anticipation that legislators in the majority party are better positioned to secure money for their districts, we include an indicator for majority party status during years in which Congress and the presidency are controlled by the same party. Unified government occurs in only 5 fiscal years within our study period: in 1994, 1995, and 2002 to 2004.[17] We also add a measure of seniority: the number of terms a legislator has served as of the year of the outlays. Finally, we introduce a variable that equals a member's two-party victory margin in the preceding congressional election, which controls for the possibility that electorally vulnerable members receive priority in discretionary spending (Shepsle 1978).

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[16] Alvarez and Saving (1997) find that Democrats reap greater electoral benefit from funneling pork to their districts than do Republicans.

[17] Recall that FAADS data are reported in fiscal years and that legislator characteristics are lagged by one year.

The vector $\mathbf{Z}_{it}$ captures a fairly rich set of observable attributes of congressional districts: population living in urban areas, African American population, population 65 years of age or over, number of farmers and farm managers, foreign-born population, median family income, unemployed population, population in the armed forces, population in public school, and population employed in manufacturing and construction.[18] Although a supplementary analysis shows that district demographic characteristics are not important predictors of the presence of a female legislator (see Appendix B), we remain concerned that unmeasured district characteristics predict both legislator sex and the amount of federal spending received by a district. We therefore include congressional district fixed effects, $\alpha_i$, to account for unobservable, time-invariant district characteristics.[19] Finally, $\beta_1$, $\psi$, and $\varrho$ are regression coefficients, $\beta_0$ is a constant, and $\varepsilon_{it}$ is an error term.

Even with a broad set of control variables, the unobservable, time-variant predictors of federal spending within a particular district are likely to be correlated across time periods. Furthermore, the geographic distribution of federal spending likely reflects the effects of senators as well as the quality and effort of House members, suggesting that there may be correlation across districts within a state. Consequently, we use robust standard errors clustered by state throughout our analysis.

## 4. Analysis and Results

Table 1 presents the results of our fixed effects models of high variation program spending. Model (1) includes district characteristics, legislator characteristics, and district and year fixed effects, as described above. The main result is clear: *within districts over time, roughly 9 percent more federal spending is brought home when there is a woman representing the district in Congress than when the district is represented by a man.*[20] We note that the inclusion of district fixed effects and the control variables works to dampen

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[18] Demographic variables for 1984 to 2001 come from Scott Adler's "Congressional District Data File." All demographic data for 2002 to 2004 come from the 2000 U.S. Census. Details are provided in Appendix A.

[19] In some instances, explained below, we use state fixed effects because of data limitations.

[20] The models in table 2 have 9,067 observations, rather than 9,135, due to missing values for electoral margin and terms in office. We also exclude 5 observations that recorded negative high variation outlays. See Appendix for details.

the magnitude of the coefficient on legislator sex relative to a model that includes only the female indicator and year fixed effects (see Appendix B), but the effect of sex in column (1) is substantively large and highly statistically significant.

The district fixed effects subsume any attributes that do not change over time, including the unchanging attributes of the states in which they are located. However, a lingering concern may be that there are unmeasured trends within districts over time that make them both more likely to elect a woman and more likely to receive federal spending. To explore this possibility, we compare the rates of change in the federal spending received by a district before and after it elects a female representative. Specifically, in model (2), we use pre- and post-female linear time trends for the 3 terms before and the 3 terms after the election of a woman. We find that the rate of increase in spending is *higher* after a woman is elected than it was before. Using an *F*-test, we reject that the two trends are equal ($p$=.06). Thus, we find no evidence that female representatives merely inherit an already favorable trend in spending; instead, the trend changes after a woman is elected.

Next, in column (3), we present a model that includes state rather than district fixed effects. This approach allows us to take advantage of more variation in the data, as 38 states had at least one woman in Congress during our study period. A disadvantage is that the state fixed effects do not account for unmeasured within-state, between-district heterogeneity. That the results of the state and district fixed effects models are so similar, therefore, is reassuring and strengthens our belief that district-level attributes do not explain the connection between legislator sex and federal spending.

Finally, in the spirit of a regression discontinuity (RD) design (Thistlewaite and Campbell 1960, Lee 2008), we estimate changes in district-level spending following close elections in which a male candidate ran against a female candidate and in which the election resulted in a change in the sex of the district's representative. Based on the closeness of the elections, we can infer that each district was roughly equally likely to have elected a woman or a man. When we restrict our analysis

to mixed-sex races in which the winning candidate garnered less than 55 percent of the vote, there are 39 instances in which the sex of a district's representative changed as a result of the election.[21] Model (4) is a first-differences regression in which the change in spending from the year before to the year after the election is regressed against changes in legislator sex and other covariates. The female effect from the close elections sample is 7 percent. Note that because we have only 39 observations in model (4), we do not attempt to control for the full set of district covariates. This is not a major concern, since we do not expect district attributes to change significantly in two years. We do control for legislator characteristics that may change along with the sex of a district's representative—party, majority status, and seniority—and the coefficients for these variables are comparable to their fixed effects counterparts. While we admittedly have few instances of close elections that produce a change in the sex of a district's representative, and therefore do not put much stock in these results taken in isolation, the findings from model (4) comport with those from the fixed effects models and provide a useful complement to them.[22]

Among the remaining variables included in table 1, only a handful demonstrate a robust relationship with federal spending. Democratic districts appear to garner more federal money in the state fixed effects model, but the result dissolves when district fixed effects are introduced. In other words, it would appear that Democrats come from districts that are otherwise prone to receive federal largess, but within-district changes in legislator party are not significantly associated with changes in spending to the district. Membership in the majority party appears to be uncorrelated with district spending.[23] Tenure in office, while positive in every specification, fails to attain statistical significance. Furthermore, the size of a congressperson's victory margin does not appear to influence the allocation of federal spending. Among the district attributes, an increasing number of

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[21] Such races are close by congressional standards, where the average election is decided by a 40-percent margin and only 7 percent of elections are decided with the winning candidate earning less than 55 percent of the vote.

[22] Appendix B provides additional RD analysis and discusses the strengths and weaknesses of our data for this design.

[23] While contrary to popular wisdom, these results are consistent with prior studies, such as Knight (2005).

African Americans is associated with increased federal spending over time. Lastly, as expected, districts that contain more of the population of the state capitol county receive more federal spending.

In summary, the unambiguous result is that female legislators succeed in directing more discretionary spending to their home districts than male representatives. A spending advantage of 9 percent amounts to approximately an extra $88 per capita per year for districts represented by women. Given that the average district has 563,732 residents, the aggregate spending increase for the district is roughly $49 million when it sends a woman to Capitol Hill.

*4.1. Is It Sex-Based Selection?*

The results of the previous section provide strong evidence that congressional districts receive more federal funding when they are represented by women than when they are represented by men. However, we have not established that the source of the spending difference is that congresswomen are more able legislators, nor that the reason for their differential success in office is what we refer to as sex-based selection. The results thus far leave open the possibility that women are stronger legislators simply because they are more attuned to their constituents, more dedicated to procuring funds for so-called women's issues (e.g., Swers 2002), or more collaborative and cooperative in their legislative and leadership style (Carey et al. 1998, Kathlene 1994, Rosenthal 1998).

In order to demonstrate that the mechanism responsible for the female spending advantage is the one we have proposed, we would like to be able to measure either variance in sex-based selection or variance in candidate quality across districts and time. With respect to the latter, we know that female House candidates tend to be more qualified than male candidates on the basis of raw, formal qualifications such as prior office-holding experience (Pearson and McGhee 2007). However, quality is much more than formal qualifications, and it is only measurable through performance. In baseball, for example, we do not know what qualities cause one player to hit more home runs than another, and it is certainly something more than just the players' experience, but we are comfortable

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concluding that the player who hits more home runs is a better hitter. Candidate quality is similar in nature. Of course, if we cannot measure quality as distinct from performance, we cannot hope to exploit variation in candidate quality to isolate its effect on performance.

Alternatively, to measure sex-based selection, we would want to quantify either the degree of sex discrimination in the district's electorate or the extent to which higher quality women self-select into politics relative to men. We would expect to find a positive relationship between congresswomen's spending advantage and the level of sex-based selection in the district, conditional on a woman being elected. Unfortunately, we know of no such measures at the district level, much less the district-by-year level. Instead, we use average constituent ideology in the district as a proxy, albeit a somewhat crude one, for the prevalence of sex-based selection in the district. We also examine federal spending outcomes for women who, we believe, faced fewer barriers to entry to politics because of their sex than other female legislators.

First, we take advantage of the fact that attitudes about women in politics are correlated with the ideology of constituents in a district.[24] We use Clinton's (2008) survey-based measure of district-level constituent ideology, which ranges from -1 (most liberal) to 1 (most conservative). This measure does not capture variation in constituent ideology over time within districts, but it does allow us to estimate the extent to which the female spending advantage varies systematically with a time-invariant measure of constituent ideology. If more conservative districts also tend to be those where average sex discrimination levels are higher or where qualified women are more reluctant to enter politics, then our theory would predict that the spending advantage achieved by female legislators in more conservative districts will be greater than the advantage received by those in liberal districts.

Table 2 presents the results of the main models with an interaction between legislator sex

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[24] Of the 11 percent of Gallup respondents who reported that they would not vote for a well-qualified female candidate for president, 63 percent identified themselves as either very conservative or conservative. Only 36 percent of those who said they *would* vote for a woman were conservative or very conservative (USA Today / Gallup Poll, February 9-11 and March 2-4, 2007).

and district-level constituent conservatism, the latter of which is centered around its mean. The main effect of district ideology cannot be directly estimated since it is constant across time periods and is therefore subsumed within the district fixed effects. The table is truncated to preserve space; all four models include the covariates whose coefficients are presented in table 1 as well as district and year fixed effects.[25] In column (1), the coefficient on legislator sex represents the spending advantage that accrues to districts of average ideology (because the ideology measure has been mean deviated) when they have female representatives. Since the average district is slightly conservative according to Clinton's measure, we conclude that female legislators elected from a moderately conservative congressional district deliver approximately 13 percent more federal spending to their constituents than male legislators. More importantly, however, the coefficient on the interaction term is positive and statistically significant at the 1 percent level. Thus, more conservative districts – when they elect women to represent them – receive a larger increase in spending than districts that have more liberal constituents. The magnitude of the coefficient implies that a one standard deviation increase in average constituent conservatism is associated with an *additional* 10 percent boost in federal spending.

We might suspect that since constituent ideology is likely to be positively correlated with legislator ideology, the interaction presented in column (1) picks up the ideological leanings of the congresswomen themselves. Since we are concerned here with general views about women in politics in the district, column (2) enters the legislator's ideology as a separate regressor, measured by his or her NOMINATE score (Poole and Rosenthal 1997). The inclusion of the individual members' ideology changes the coefficients on the female indicator and the interaction term only modestly. Notably, the coefficient on the interaction term is still large, positive, and significant at the 1 percent level.

These results are consistent with our argument that the mechanism driving the spending ad-

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[25] We lose a substantial number of cases due to the fact that Clinton's measure of constituent ideology only exists according to the congressional district boundaries of the 1990s. Where possible, we used the same values of this measure for corresponding districts in the 1980s and 2000s. See Appendix A for details.

vantage is a talent and effort differential induced by sex-based selection. We see from columns (1) and (2) of table 2 that the positive effect of female representation on spending is considerably larger in districts where public attitudes are likely to be less friendly to the idea of women in politics. Of course, district ideology is a rough measure for sex-based selection, so we bolster these results by comparing two groups of women for whom, we assume, the political selection process differs.

One route by which women have historically entered Congress is by succeeding their husbands who passed away while in office (Burrell 1994). If widows benefit from outpourings of public sympathy surrounding the deaths of their husbands, they are unlikely to be subjected to the same degree of electoral scrutiny as other women. Moreover, since they have closely followed their husbands' tenure in office, widows may be less inclined to think themselves insufficiently qualified for political office than other women. In other words, we would expect that widows are free of many of the hurdles other women must clear on the way to office; therefore, they would not need the same edge in quality or effort in order to become candidates and get elected. In fact, widows may even be able to win with a quality *disadvantage* relative to male candidates thanks to public sympathy. If sex-based selection is the mechanism that causes women to perform better in office than men, then widows should have a smaller spending advantage than other women, and possibly even a spending disadvantage relative to men. Thus, we compare spending outcomes for districts represented by widows who succeeded their husbands in office with districts represented by other women as a window onto female performance in environments with and without substantial sex-based selection.[26]

Column (3) of table 2 presents a test of these predictions. We note upfront that our power to conduct this test is limited because we have only eight widows in our data set, accounting for a combined 57 years of presence in the legislature. Nevertheless, the results confirm our expectations. We create separate binary indicator variables for widows and female non-widows; males are the

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[26] We are grateful to Linda Fowler for suggesting this idea.

omitted category. The model includes the full set of legislator characteristics, all the district-level demographics, and state and year fixed effects. The small number of widows prohibits us from running district fixed effects models.

We cannot reject the null hypothesis of no spending advantage for widows, while the female non-widow effect is large, positive, and statistically significant. In fact, the widow coefficient is negative, suggesting that widows deliver less spending than male legislators, although this difference is not significant. An *F*-test allows us to reject the hypothesis that the coefficients for widows and non-widow females are equal at $p = 0.054$. This result lends support to the hypothesis that sex-based selection explains the female spending advantage. If widows are *not* held to a higher standard than male candidates by voters and *not* likely to underestimate their qualifications for politics, then we should *not* expect female legislators who succeed their late husbands to perform better than male legislators. The results presented in column (3) of table 2 show that this is the case. Of course, we recognize that there may be other reasons why widows are less effective in office. These results, while consistent with our theory, are not dispositive.

*4.2. Alternative Explanations*

The preceding results show that congresswomen's spending advantage cannot be explained by the districts they represent and is even larger in districts where women are elected amidst challenging conditions. In this section, we address the question of whether there is some other correlate of being female, apart from the sex-based selection, that can explain congresswomen's success in garnering federal spending for their districts.

It is well known that electorally vulnerable members of Congress seek additional spending for their districts (e.g., Cain et al. 1987). Is it possible that women respond disproportionately to electoral vulnerability by seeking more federal spending for their districts? We test for this in model (1) of table 3 by estimating a district fixed effects model that includes an interaction between the fe-

male indicator and the candidate's electoral margin in the preceding election. (To conserve space, only the coefficients for the primary independent variables of interest are reported, although the full set of control variables is included in the models reported in table 3.) If it is true that women respond disproportionately to electoral vulnerability, we should find a negative coefficient on the interaction term. In fact, however, the coefficient is positive and insignificant. We can therefore dismiss the possibility that electoral vulnerability is at the source of women's spending advantage.

Next, we investigate the role of partisanship and ideology. The women in Congress during our study period are more likely to be Democrats (65 percent) than the men are (50 percent). Women are also more ideologically liberal: the average NOMINATE score (Poole and Rosenthal 1997) for a female member of Congress is -0.15, while the average for congressmen is 0.05.[27] In model (2) of table 3, we estimate an interaction between the female and Republican indicators. While female Republicans demonstrate a modest edge over female Democrats, the difference is not statistically significant. In model (3), we estimate the interaction between the female indicator and the NOMINATE scores. Again, the point estimate suggests that conservative women garner more spending than liberal women, but the interaction is not significant. Based on these analyses, we reject the idea that partisanship or ideology can explain the female spending differential.

As a next step, we explore one avenue through which women may attain their added spending: committee assignments. Observing that women achieve more desirable committee assignments would be consistent with our theory of sex-based selection. However, the observation would also be equivalent to the alternative explanation that parties display favoritism toward women in the committee assignment process, perhaps because there are few female members and their presence on top committees is valuable for other reasons, such as public relations. We use the Groseclose and Stewart (1998) House committee desirability scores to place values on the committee portfolios of

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[27] The NOMINATE scale ranges from -1 (most liberal) to 1 (most conservative).

individual legislators in each year. We find that, controlling for seniority, women have slightly less desirable committee portfolios, although the difference is not statistically significant (not shown).[28] In any case, when we control for a complete set of committee indicator variables as well as indicator variables for committee chairs, committee ranking minority members, and party leaders, which we do in model (4) of table 3, the estimated female spending advantage is essentially unaffected. Women do not attain their spending advantage merely by securing better committee assignments.[29]

In analysis not shown, we also investigate the nature of the spending that women bring home to their districts.[30] Women in politics scholars have found that female politicians are more active in areas considered to be "women's issues" (e.g., Swers 2002). If women derive their advantage in spending primarily from federal programs that reflect traditional "female" legislative priorities, we might be dissuaded that it is women's talent and effort that drives the spending effect.

To the contrary, we find that the female spending advantage is present across a diverse set of federal programs. We estimate fixed effects models of spending from each of the four agencies responsible for the greatest amount of high variation program spending from 1984 to 2004: the Departments of Agriculture, Health and Human Services, Transportation, and Education. Only Agriculture fails to demonstrate a spending advantage for women. Women have a clear advantage in securing funds for their districts from Transportation, Health and Human Services, and Education. In fact, the coefficient for Transportation is largest in magnitude, a result that is particularly suggestive since transportation is the area identified by congressional scholars as especially amenable to pork barrel politics (e.g., Ferejohn 1974). It is therefore not the case that women only have an advantage in securing spending for programs related to "women's issues."

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[28] These results are presented in Appendix B.
[29] The null findings for committee chairs, ranking minority members, and party leaders are contrary to expectations. However, we note that these positions change relatively infrequently, and so the estimates are very imprecise in the context of district fixed effects.
[30] The following results are detailed in Appendix B.

Lastly, we investigate whether congresswomen's success in securing federal funding for their

constituents comes at the expense of attention to another important aspect of their job – policymak-

ing. As a test of whether congresswomen are less effective policymakers than congressmen, we ana-

lyze bill sponsorship and cosponsorship patterns for male and female members of the House. We

use data made available by Fowler (2006), who compiled sponsorship information for every piece of

legislation proposed in Congress since 1973.[31]

We examine the number of bills sponsored and cosponsored by women relative to men

from 1984 to 2004, modeling each as a function of legislator sex, party, and majority status and in-

cluding indicator variables for committee chairs, ranking minority members of committees, and par-

ty leaders. To account for the possibility that electorally vulnerable members are spurred into action,

we also control for the members' vote margin in the preceding election. In addition, because some

committees provide more opportunities for legislative activity than others, we include a full set of

committee membership indicator variables. We also include the demographic variables from table 1

to control for the possibility a member might sponsor more bills if she is from a district where con-

stituents are particularly attentive to legislative behavior. We expect that it is easier for ideologically

moderate members to work with larger numbers of their colleagues than more extreme members, so

we include each legislator's ideological distance from the legislator with the median NOMINATE

score in each congress. Finally, we include congressional term fixed effects to account for general

changes in sponsorship and cosponsorship over time. To conserve space, we do not report the coef-

ficients for the demographic variables, committee variables, or fixed effects.[32]

Clearly, it is *not* the case that women neglect their roles as policymakers. In fact, model (5) of

table 3 demonstrates that congresswomen sponsor *more* legislation than congressmen. On average,

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[31] See Appendix A for details.
[32] There are 4752 observations in models (5) and (6), rather than the full 4785, due to missing values for *Terms* (24 miss-
ing) and *Margin* (9 missing). See Appendix A for details.

women sponsor about three more bills per congress, which is a difference of roughly 17 percent relative to the member average of 18 bills. Women are also more active in supporting the legislation of their colleagues through cosponsorship. Congresswomen cosponsor about 26 more bills per congress than congressmen, as seen in model (6). In results presented in the Appendix, we find that women also garner cosponsorship support from a greater number of their peers, which suggests that women have stronger networks of collaboration with their colleagues than congressmen.[33]

There are obvious limitations to counting sponsored and cosponsored bills as a measure of legislators' attentiveness to policymaking. In particular, the decision to cosponsor a bill is relatively costless. In more comprehensive examinations of congressional policymaking, however, Volden and Wiseman (2010) and Volden, Wiseman, and Wittman (2010) track each bill introduced in the 97th to 110th congresses through all stages of the legislative process – from introduction to signing – and find that women score significantly higher on their measure of "legislative effectiveness" than men do. Not only does this evidence refute the argument that women pay close attention to distributing district-level benefits at the expense of policymaking, but it is consistent with the idea that policymaking is yet *another* area in which congresswomen outperform congressmen.

## 5. Discussion

If we believe the evidence that the average woman underestimates her qualifications relative to the average man, then it is reasonable to conclude that a woman who identifies herself as a candidate for national office is more qualified than the average male candidate. If it takes more talent and greater effort for female candidates to be taken seriously by voters, campaign contributors, and party gatekeepers, then the women who succeed in the electoral process are likely to be more talented and hardworking than the men who do the same. Because of this, the women who are elected to Congress are actually poised to be more effective legislators than their male counterparts.

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[33] See Appendix B for additional results.

Our theory of sex-based selection makes precisely this point. It does not matter whether women are elected to public office at lower rates than men because they perceive their own qualifications differently or because bias against women in the electorate produces a barrier to entry for them. The central implication of sex-based political selection is that the women we observe in office will, on average, outperform the men.

We test this implication using legislators' success in directing funds to their home districts as our primary measure of performance. The federal spending data provide strong empirical support for the prediction that women outperform men. All else equal, congressional districts receive roughly 9 percent more high variation federal program spending when they are represented by women. This spending bonus amounts to approximately $88 per capita, or $49 million in total, for districts that have a woman in Washington in a given year. According to the estimates contained in Levitt and Snyder (1997), the addition of $88 per capita in high variation program spending produces an electoral reward for the incumbent of almost 2 percent of the popular vote.

However, our results are not invulnerable to criticism. Without a direct way to measure legislator ability or effort, we cannot definitively show that these factors explain female success in office. In section 4.2, we considered a set of competing explanations for the spending differential and brought each one to the data. The results allow us to reject the possibility that women's electoral vulnerability, differing ideology or partisanship, or advantageous committee assignments can explain the connection between legislator sex and spending. Moreover, it is not the case that female House members manage to excel in securing federal spending for their districts by neglecting policymaking: they actually sponsor and cosponsor more bills per congress than their male counterparts.

While our evidence cannot substitute for a direct test of the relationship between legislator sex and ability or effort, it dispels several reasonable competing explanations. For example, one might conjecture that political party leaders intentionally channel disproportionate funding to wom-

en's districts, either to protect their relatively small cadres of female representatives, or simply to make it obvious that they do not discriminate against them. Alternatively, perhaps female legislators feel the need to work harder in order to prove themselves to their colleagues in the male-dominated House. While these are all plausible explanations for a female spending advantage in general, they cannot account for why it does not apply to women who succeed their late husbands in office or why it is greater in districts where constituents are more conservative. Any alternative explanation for our findings would have to account for all of these patterns, as well as the fact that women sponsor and cosponsor more bills than their male counterparts. We believe that our theory of sex-based selection provides the most logical and parsimonious explanation for these findings.

In closing, we note that our theoretical contribution does not apply uniquely to women or to the measures of performance that we have chosen. Future research might look for other areas in which females excel in office. In addition, our theory suggests that members of other groups that suffer from discrimination by the electorate also must perform better in order to be elected. Future research might apply a similar analysis to African Americans or Latinos in Congress. However, we anticipate that the use of race-conscious districting, in particular majority-minority districts, will seriously confound testing of the theory. If racial districting makes it easier for minorities to be elected, then there is no reason to expect that those in office will perform any better than average. Of course, political selection is not based solely on candidates' personal attributes. We might expect, for example, a Republican elected from an historically Democratic district to demonstrate a similar quality advantage. These are empirical questions that we may explore in future research.

At the most general level, our results highlight the importance of connecting research on women in politics, models of political agency, and the economics of discrimination. Women are some of the most effective politicians in Congress. One only has to look to the political selection process to understand why.

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**Table 1: Legislator Sex and Discretionary Federal Domestic Spending**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Female | 0.091 | | 0.12 | 0.069 |
| | (0.043)** | | (0.067)* | (0.033)** |
| Pre-Female Trend | | 0.013 | | |
| | | (0.008) | | |
| Post-Female Trend | | 0.03 | | |
| | | (0.012)** | | |
| Republican | -0.001 | -0.002 | -0.079 | 0.043 |
| | (0.022) | (0.023) | (0.032)** | (0.033) |
| Majority | 0.003 | 0.005 | -0.042 | 0.025 |
| | (0.028) | (0.028) | (0.031) | (0.082) |
| Terms | -0.001 | -0.001 | 0.002 | 0.009 |
| | (0.003) | (0.003) | (0.004) | (0.008) |
| Margin | 0.003 | .000 | 0.004 | |
| | (0.023) | (0.023) | (0.059) | |
| Population | 0.35 | 0.361 | 2.846 | |
| | (0.730) | (0.732) | (0.604)*** | |
| State Capitol | 0.062 | 0.062 | 0.121 | |
| | (0.017)*** | (0.017)*** | (0.007)*** | |
| Age 65 and Older | -0.033 | -0.029 | -0.45 | |
| | (0.211) | (0.211) | (0.189)** | |
| Black | 0.161 | 0.16 | 0.061 | |
| | (0.062)** | (0.062)** | (0.024)** | |
| Construction | 0.015 | 0.014 | -0.588 | |
| | (0.171) | (0.173) | (0.119)*** | |
| Public School | -0.382 | -0.391 | -1.296 | |
| | (0.299) | (0.295) | (0.273)*** | |
| Farmers | 0.049 | 0.045 | 0.161 | |
| | (0.029) | (0.030) | (0.053)*** | |
| Foreign Born | -0.014 | -0.017 | -0.103 | |
| | (0.051) | (0.052) | (0.071) | |
| Manufacturing | -0.187 | -0.189 | -0.402 | |
| | (0.133) | (0.133) | (0.090)*** | |
| Median Income | -0.075 | -0.075 | -0.371 | |
| | (0.151) | (0.152) | (0.157)** | |
| Unemployed | 0.1 | 0.103 | 0.055 | |
| | (0.111) | (0.111) | (0.121) | |
| Armed Forces | -0.012 | -0.012 | -0.022 | |
| | (0.034) | (0.034) | (0.016) | |
| Urban | 0.005 | 0.006 | -0.015 | |
| | (0.006) | (0.006) | (0.015) | |
| Constant | 18.837 | 18.813 | 13.745 | 0.003 |
| | (2.327)*** | (2.342)*** | (1.588)*** | (0.050) |
| Observations | 9067 | 9067 | 9067 | 39 |
| R-squared | 0.9 | 0.9 | 0.66 | 0.063 |
| Model Specification | District & year fixed effects | District & year fixed effects | State & year fixed effects | First-differences |

*Notes*: Robust standard errors clustered by state in parentheses. The dependent variable in models (1) through (3) is ln(high-variation federal out-lays). In model (4), the dependent variable is the difference in logged outlays between two consecutive years. Model (4) includes only observations in which a mixed-sex close election (where "close" is defined as a winning vote share of less than 55 percent) results in a change in the sex of a district's representative (see text). Outlays are in constant 2004 dollars. Female = 1 if legislator is female. Pre- and Post-Female Trends are linear trends for the 6 years before and 6 years after the election of a woman, respectively. Republican = 1 if legislator is Republican. Majority = 1 if legislator is a member of the House majority party when Congress and the presidency are controlled by the same party. All demographic variables are transformed as natural logarithms. * significant at 10% level; ** significant at 5% level; *** significant at 1% level.

**Table 2: Evidence of Sex-Based Selection**

| | District Ideology (1) | District & Member Ideology (2) | Widows (3) |
|---|---|---|---|
| Female | 0.12 | 0.106 | |
| | (0.048)** | (0.046)** | |
| Female * Constituent ideology | 0.584 | 0.656 | |
| | (0.205)*** | (0.193)*** | |
| Member ideology | | -0.426 | |
| | | (0.098)*** | |
| Female non-widows | | | 0.138 |
| | | | (0.068)** |
| Widows | | | -0.104 |
| | | | (0.119) |
| Constant | 18.817 | 18.764 | 13.814 |
| | (2.388)*** | (2.409)*** | (1.633)*** |
| | | | |
| Observations | 7404 | 7404 | 9067 |
| R-squared | 0.89 | 0.89 | 0.66 |
| Fixed effects | District & year | District & year | State & year |
| | | | |
| *F*-test: Widows = Non-widows | | | $p = 0.054$* |

Notes: Models include all control variables reported in table 1. Robust standard errors clustered by state in parentheses. The dependent variable is ln(federal outlays by congressional district by year) from high varia-tion programs, 1984-2004. Outlays are in 2004 dollars. Female = 1 if legislator is female. Constituent ideology is the average constituent ideology in the district as measured by Clinton (2008). Member ideology is the legislator's DW Nominate score. Widows = 1 if legislator is female who succeeded her late husband in office. Female non-widows = 1 for all other female legislators.
* significant at 10% level; ** significant at 5% level; *** significant at 1% level.

**Table 3: Alternative Explanations**

| | High Variation Program Spending | | | | Bills Sponsored | Bills Cosponsored |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Female | 0.085 | 0.055 | 0.093 | 0.093 | 2.84 | 25.83 |
| | (0.057) | (0.041) | (0.047)* | (0.046)** | (1.06)*** | (13.09)** |
| Republican | -0.002 | -0.01 | | 0.004 | 0.91 | -54.63 |
| | (0.022) | (0.022) | | (0.023) | (0.740) | (7.90)*** |
| Terms | -0.001 | -0.001 | -0.002 | 0.001 | 1.01 | -3.36 |
| | (0.003) | (0.003) | (0.003) | (0.004) | (0.14)*** | (0.99)*** |
| Margin | 0.002 | 0.003 | 0.005 | 0.005 | 2.2 | -14.32 |
| | (0.025) | (0.023) | (0.022) | (0.023) | (0.97)** | (8.860) |
| Female * Margin | 0.017 | | | | | |
| | (0.100) | | | | | |
| Female * Republican | | 0.089 | | | | |
| | | (0.081) | | | | |
| Ideology | | | -0.086 | | | |
| | | | (0.037)** | | | |
| Female * Ideology | | | 0.107 | | | |
| | | | (0.097) | | | |
| Committee Chair | | | | -0.021 | 10.83 | -23.88 |
| | | | | (0.047) | (2.35)*** | (16.09) |
| Ranking Minority | | | | -0.026 | 0.53 | 51 |
| | | | | (0.031) | (2.030) | (18.54)*** |
| House Leader | | | | -0.099 | 1.62 | -76.66 |
| | | | | (0.224) | (5.550) | (35.66)** |
| Majority Party | | | | | 3.95 | 23.98 |
| | | | | | (1.06)*** | (9.47)** |
| Distance from Median | | | | | 3.74 | 109.9 |
| | | | | | (3.030) | (25.02)*** |
| Constant | 18.83 | 18.91 | 18.75 | 18.66 | 2.1 | 516 |
| | (2.348)*** | (2.323)*** | (2.322)*** | (2.374)*** | (24.11) | (345.34) |
| Observations | 9067 | 9067 | 9067 | 9067 | 4752 | 4752 |
| Committee Indicators Included? | No | No | No | Yes | Yes | Yes |
| R-squared | 0.9 | 0.9 | 0.9 | 0.9 | 0.26 | 0.36 |

*Notes*: The dependent variable for models 1-4 is ln(federal outlays by congressional district by year) from high variation programs, 1984-2004. Outlays are in 2004 dollars. The dependent variable for model 5 is the number of bills sponsored per congress, and the dependent variable for model 6 is the number of bills cosponsored per congress. Models 1-4 include all control variables reported in table 1, district fixed effects, and year fixed effects. Model 4 includes indicator variables for each committee. Models 5-6 include all district demographic controls reported in column (1) of table 1, congress fixed effects, and dummy variables for membership on each standing committee. For models 1-4, standard errors are clustered by state. For models 5-6, standard errors are clustered by member of Congress. Ideology is the legislator's DW Nominate score. * significant at 10% level; ** significant at 5% level; *** significant at 1% level.