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ABSTRACT

Gender Differences in Cooperative Environments? Evidence from the U.S. Congress*

This paper uses data on bill sponsorship and cosponsorship in the U.S. House of Representatives to estimate gender differences in cooperative behavior. We employ a number of econometric methodologies to address the potential selection of female representatives into electoral districts with distinct preferences for cooperativeness, including regression discontinuity and matching. After accounting for selection, we find that among Democrats there is no significant gender gap in the number of cosponsors recruited, but women-sponsored bills tend to have fewer cosponsors from the opposite party. On the other hand, we find robust evidence that Republican women recruit more cosponsors and attract more bipartisan support on the bills that they sponsor. This is particularly true on bills that address issues more relevant for women, over which female Republicans have possibly preferences that are closer to those of Democrats. We interpret these results as evidence that cooperation is mostly driven by a commonality of interest, rather than gender *per se*.

JEL Classification: D72, D70, J16, H50, M50

Keywords: U.S. Congress, cooperativeness, bipartisanship, gender

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1 Introduction

As the share of women in legislatures and executive positions continues to grow in the U.S. and around the world, it is natural to ask how this change is likely to shape future policy. It is not uncommon to read political commentators arguing that more women in key posts in the executive and legislative branches of government would result in more desirable policy outcomes. In the U.S., one of the most commonly voiced arguments is that women's style of politics is more conducive to cooperation, and may contribute to breaking partisan gridlock in Congress. A recent editorial by Swanee Hunt, a former U.S. Ambassador to Austria, argues that "women may be our best chance at breaking through disastrous partisan gridlock. As Congress operates in an increasingly acrimonious space, politicians on each side are locked in a stare-down. Yet the other current and future women in the Senate nodded agreement when Susan Collins told Diane Sawyer on *ABC World News*, 'If [women] were in charge of the Senate and of the administration, we would have a budget deal by now... With all deference to our male colleagues, women's styles tend to be more collaborative.' "[1] This opinion also reflects a widely held popular opinion. According to a recent poll conducted by the PEW Research Center 34% of adults think that female politicians are better at working out compromises than their male counterparts, with only 9% saying that men are better.[2]

Yet, in the absence of credible quantitative measures of cooperativeness, many of these arguments are guided more by casual observation than by solid empirical evidence. While some recent studies have found that female politicians are able to deliver better policy outcomes, in a variety of different contexts and at different levels of government (more transfers from the central government, more investment in public goods that address women's concerns, less corruption), others have reached more mixed conclusions. A common shortcoming of most of the existing studies is that they are only able to look at final outcomes, with little understanding of the process and mechanism through which female representatives may be able to achieve superior policy outcomes. Therefore, it is difficult to distinguish whether women are able to achieve better outcomes because they are inherently more skilled, hard-

[1] *The Boston Globe*, "For the sake of democracy, elect women," January 2, 2013.
[2] *PEW*, "Women and Leadership," January 14, 2015.

working or ambitious (as would be the case if a woman has to overcome discrimination to be elected, so that only the most qualified women are observed in the legislative body), or because they act more cooperatively, or are able to induce more cooperation from those they interact with.

The goal of this paper, therefore, is to study gender differences in cooperative behavior, using the large amount of information available for the United States Congress. Legislatures are particularly well suited to study cooperative behavior, because elected representatives, almost by definition, require the cooperation of others to advance their preferred policy initiatives. Moreover, because almost all aspects of parliamentary activity are recorded, we have a rich wealth of data that allows us to create quantifiable and credible measures of cooperativeness. [3]

We focus in particular on sponsorship and co-sponsorship of Congressional bills. Every bill has one main sponsor and can be signed by any number of cosponsors (the exact role of sponsors and cosponsors will be discussed later). We construct two main measures of cooperative behavior: a) the number of cosponsors on bills sponsored, which can be viewed as a measure of coalition-building ability, both within and across party lines; and b) the percent of cosponsors from the opposite party out of the total number of cosponsors (including the main sponsor) – this second measure can be viewed as measure of bipartisanship.

Two main facts on gender differences emerge from a simple descriptive analysis of the data. First, female representatives tend to recruit a larger number of cosponsors on the bills that they sponsor, and the result is true for representatives of both parties. The results on bipartisanship, however, reveal a different picture. While there are no apparent gender differences in bipartisanship when we look at all Congress members as a whole, important differences emerge when we conduct the analysis separately by party. Within the Democratic Party, female representatives are in general less likely to sponsor legislation that attracts opposite-party cosponsors. The opposite is true among the Republican Party, where female representatives tend to attract a larger share of opposite-party cosponsors than their male

[3] One could object that women in Congress are a highly selected group, and not representative of the whole population. However, the focus on a group of high-achieving women in a male-dominated environment may actually be more helpful for understanding the gender gap at the top of the occupational distribution, which has been the focus of much of the literature. See Section 2.

counterparts.

Clearly, any differences in cooperative behavior among Congress members may reflect the preferences of one's constituents as well as any individual differences in cooperativeness. Moreover, it may be that cooperativeness is driven by other personal Congress member characteristics that are correlated with gender, rather than gender *per se*. To address these potential confounding factors, we control in our analysis for a large number of individual and district characteristics. While some of the differences are attenuated, especially when one controls for district characteristics, the general pattern of results remains robust.

To further probe whether the results are driven by potential selection of women candidates into electoral districts with distinct preferences for cooperativeness, we employ a number of additional econometric methodologies, including regression discontinuity (RD) and matching. RD methods have become very popular in the empirical political economics literature, because, if the necessary assumptions are satisfied, the gender of the elected representative can be thought of as exogenously determined by idiosyncratic events on Election Day, and therefore the design allows us to identify the causal effect of gender on the outcomes of interest. However, we caution that in our setting the validity of the design hinges on more stringent assumptions than usual, especially when we conduct the analysis separately by party.[4]

Most of the results are robust to the treatment of selection. In particular, we find robust evidence that Republican women recruit more cosponsors and attract more bipartisan support on the bills that they sponsor. On the other hand, among Democrats the gender gap in the number of recruited cosponsors becomes statistically insignificant, but women-sponsored bills continue to have fewer cosponsors from the opposite party.

To make sense of the patterns in the data, we develop a simple model of a legislator's decision over the content of a bill and the effort expended in recruiting cosponsors. Legislators may differ in their ideological position, their willingness to deviate from their ideal policy position, and their cost of recruiting cosponsors. We derive predictions on how the number of cosponsors and the fraction of cosponsors of the opposite party vary with these thre

[4]We elaborate on this point more fully in Section 7.

parameters. Straightforwardly, the number of cosponsors recruited decreases with the cost of recruiting, and the fraction of cosponsors of the opposite party increases as the legislator's ideal policy position is closer to that of the median voter, and the cost of deviating from one's bliss point is lower.

The gender differences in bipartisanship can be mostly explained by gender differences in policy preferences within each party. Even after accounting for district characteristics, women representatives tend to be more liberal than men in their own parties (a fact that is also reflected in the roll-call voting record). Therefore, female Republicans' policy positions are closer to those of the median voter, and they are more likely to sponsor bills that attract bipartisan support; by contrast, female Democrats' positions are more distant from the median voter. On the other hand, we find no support for the hypothesis that women are inherently more willing to compromise, as that would imply that women in both parties would attract more bipartisan support, in contrast to what we observe in the data.

The gender difference in the number of recruited cosponsors, however, cannot be rationalized in terms of differences in policy preferences, but requires some intrinsic diversity in the ability to foster cooperation. This is true especially for female Republicans, who exhibit a solid advantage in recruiting cosponsors, but not necessarily for female Democrats, whose effect on the number of cosponsors is not robust to the treatment of selection.

We conduct a number of additional analyses to further probe the meaning of these results. First, we document that there is some degree of cooperation along gender lines: women of both parties tend to attract more female cosponsors. Other than this, however, there are no substantive gender differences in the seniority, status, or degree of influence of the cosponsors recruited. In other words, there appears to be no "quality-quantity" tradeoff in the recruitment of cosponsors. Second, gender differences in both coalition-building and bipartisanship are more pronounced among more senior Congress members. This result seems to go against the hypothesis that female Congress members need to be more active and "work harder" to overcome discrimination on the part of voters and colleagues. Third, we note that Republican women are particularly likely to attract bipartisan support on bills related to women's issues, over which they possibly lack support within their own party, while the opposite holds for Democratic women. This reinforces the idea that bipartisanship is mostly driven by a commonality of interests, rather than gender *per se*.

Before moving forward, it is useful to spend a few words on what exactly is meant by cooperative behavior. The *Oxford English Dictionary* defines "cooperativeness" as "the act of working together or with others to the same end." In the economics literature, the term has sometimes been given a slightly different connotation. For example, Niederle (2015), in her survey of the experimental literature on gender differences in preferences and traits, focuses on two particular definitions of cooperation: cooperation as altrusim, and cooperation in prisoner's dilemma or public good games. Abstracting for a moment from the repeated nature of the interactions between elected representatives, it is easy to see how cosponsorship of congressional bills maps into either of these definitions, as well as the dictionary definition of "working together or with others to the same end." The *one-shot* act of cosponsoring can be either seen as an act of altruism toward another representative (i.e., an act from which the cosponsor gains no direct benefit), or as a contribution to a public good (i.e., an act from which the cosponsor may directly benefit, but would rather have someone else do instead).[5]

Of course, given the repeated nature of the interactions, one may choose to cooperate in the one-shot game not because of any intrinsic trait, but because of the expectation of being reciprocated in the future. Nonetheless, it is clear that any cooperative outcome in a repeated game is more likely to be sustained if the players are more predisposed to also cooperate in the one-shot game. Therefore, comparing Congress members' propensity to cooperate on individual bills can shed light on individual cooperativeness, regardless of whether the individual act is driven by purely altruistic motives or by strategic behavior.

Finally, one may want to distinguish between the propensity to cooperate, and the propensity to induce others to cooperate. In our analysis we focus mostly on the latter, by looking at the number and type of cosponsors that the main sponsor is able to recruit. The main reason for this is that the action and role of the main sponsor is more clearly

[5]In thinking about bipartisan behavior, it can also be useful to think of cooperation in a coordination game à la Battle of the Sexes, in which the players agree that they need to coordinate on one action to achieve a goal, but have different preferences on which action to choose. For example, both sides may agree that it is necessary to balance the budget, but one side may prefer spending cuts while the other prefers higher taxes. In this setting, cooperation arises when one side agrees to move toward the position of the other.

defined, and we can abstract from the debate about the exact role and motives of cosponsors (Krehbiel, 1995).

The rest of the paper is structured as follows: Section 2 discusses how the paper fits into different strands of the literature. Section 3 gives some institutional background on the U.S. Congress, and on bill sponsorship and cosponsorship. Section 4 presents the data and describes how we construct our different measures of competitiveness. Section 5 outlines a stylized model that will help us interpret the empirical findings. Section 6 describes some preliminary evidence on gender differences in cooperative behavior including the basic OLS analysis. Section 7 discusses the empirical approach we employ to address the potential biases of the simple OLS analysis and presents the main empirical results. Section 8 concludes.

2 Related Literature

This project is related to at least three strands of literature: 1) on gender differences in the performance and behavior of political representatives; 2) on bipartisanship and legislative activity in Congress, as measured by roll-call votes, sponsorship and cosponsorship activity; and 3) on gender differences in attitudes towards competition and cooperation.

Women in Politics. There is an emerging literature in economics on the choices and performance of female politicians. Much of the literature has been concerned with identifying gender differences in the way local fiscal policy is conducted. In an early and influential paper, Chattopadhyay and Duflo (2004) use political reservations for women in Indian Village Councils to show that female leaders invest more in public goods more closely linked to women's concerns.[6] However, in contexts in which there are no reserved quotas for female politicians, the results have been more mixed. Gagliarducci and Paserman (2012), using a large sample of Italian municipal governments, find little evidence of differences in policy outcomes such as the size of the budget deficit or the allocation of expenditures between municipalities headed by male and female mayors, but a large difference in the probability

[6] Using similar data from India, Clots-Figueras (2011) finds that female State Legislators who are elected in scheduled caste seats favor women-friendly laws, such as amendments to the Hindu Succession Act that give women the same inheritance rights as men, and affect the educational levels of individuals who grow up in the districts where these female politicians are elected (Clots-Figueras, 2012).

that a female mayor survives until the end of her term. Ferreira and Gyourko (2014) conduct a similar analysis in a sample of U.S. municipalities, and find no effect of gender of the mayor on policy outcomes related to the size of local government, the composition of municipal spending and employment, or crime rates.[7]

Other papers have looked instead at gender differences in the behavior of legislators, at both the national and local level. Funk and Gathmann (2015), using data from direct democracy in Switzerland, find large gender gaps in the areas of health, environmental protection, defense spending and welfare policy, but no difference in the overall size of government. Rehavi (2007), using data from state legislatures in the U.S., and exploiting the quasi-random variation in the number of female legislators created by the outcomes of close elections, finds that women contributed to a modest but significant increase in state health spending and slowed the growth of corrections institution spending.

Most closely to this project are two recent papers that look in detail at women's legislative effectiveness using data from the U.S. Congress. Anzia and Berry (2011) find that women in the U.S. Congress are able to deliver more discretionary federal spending to their districts, and are also more politically active in that they sponsor and cosponsor significantly more legislation. They interpret these results as evidence of bias on the part of voters, which induces only the most talented and hard-working female candidates to succeed in the electoral process. The paper, however, is silent as to the mechanism through which congresswomen are able to deliver better policy outcomes to their districts, and does not address at all the question of whether women engage in more bipartisan behavior. Volden et al. (2013) instead find that women are more effective at keeping their sponsored bills alive through the legislative process, but only when they are in the minority party.

Bipartisanship and Legislative Activity in Congress. Much attention has been devoted in the political science literature to the issue of partisanship and polarization in the U.S. Congress. Using ratings issued by interest groups such as the Americans for Democratic Action and the United States Chamber of Commerce, Poole and Rosenthal

[7] In contrast, Brollo and Troiano (2015), find that Brazilian municipalities headed by female mayors are awarded more discretionary federal transfers, are less likely to have administrative irregularities, and achieve better health outcomes; however, despite these results, female mayors are less likely to be re-elected, probably because they engage less in political patronage.

(1984) found that beginning in the mid-1970s American politics became much more divisive, with more Democrats staking out consistently liberal positions, and more Republicans supporting conservative ones. Building on these early findings, Poole and Rosenthal (1985) developed a spatial measure of legislative ideology aggregating information from all roll-call votes in Congress. The NOMINATE score and its refinements (D-NOMINATE and DW-NOMINATE) are now updated continuously on Poole and Rosenthal's website (http://www.voteview.com) and confirm that party polarization has continued to increase since the 1980s, and has even accelerated since the mid-1990s.

In the literature there is some debate about how to correctly interpret roll-call voting behavior, and the extent to which it is governed by party discipline. The traditional notion, originally articulated by Mayhew (1974) and later assessed in an empirical study by McCarty, Poole and Rosenthal (2001), is that parties have generally had negligible influence on roll-call voting behavior, the voting on the floor being mostly dependent on the ideological position of each representative and their loyalty to the constituency. This view, however, contrasts with other recent empirical studies, like Jenkins (1999), Cox and Poole (2002), Ansolabehere, Snyder and Stewart III (2001) and Snyder and Groseclose (2000), which show instead that parties largely affect the roll-call voting behavior, the incidence being highest on close votes and key party issues.

Harbridge (2015), however, argues that focusing only on roll-call voting may miss part of the picture, because the set of bills that actually reaches a roll-call vote is determined endogenously by the congressional leadership, which has an incentive to bring to the floor only partisan bills that are not likely to create divisions within the party. In fact, Harbridge develops a new measure of bipartisanship based on bill cosponsorship coalitions, and shows that bipartisanship in bill cosponsorship continues at relatively high levels, even as polarization has increased. The argument for using cosponsorship activity as a measure of bipartisanship is that it is less likely to be subject to agenda control and is one of the most independent activities of Congress members. While there is some debate about the exact nature of cosponsorship (whether it is used as a low-cost way of taking position and communicate with constituents, or as a way to send signals within the legislature; see Krehbiel, 1995, and Kessler and Krehbiel, 1996), we agree with Harbridge's position that cosponsorship of bills that receive support from both side of the aisle is a credible measure of bipartisanship and cooperation across party lines.

Gender and Competition/Cooperation. Finally, this paper can also have implications that go beyond the political arena. Understanding gender differences in cooperative behavior may have important implications for organizations in a variety of different settings. An organization's success may depend both on the workers' incentives to excel and stand out individually relatively to their peers (as highlighted by the vast literature on rank-order tournaments pioneered by Lazear and Rosen, 1981), but also on the workers' propensity to cooperate and work together as a team towards the common good. Understanding gender differences in the ability to cooperate may help us understanding the factors that shape the wage distribution, and may also yield insights on the optimal organization of team production.

Recent research has highlighted substantial gender differences in preferences for competitive environments and in performance in such environments. Men are more likely to select into more competitive compensation schemes (Niederle and Vesterlund, 2007; Dohmen and Falk, 2011; Booth and Nolen, 2012); they are more likely to seek difficult challenges (Niederle and Yestrumskas, 2008); they tend to raise their performance in competitive settings (Gneezy, Niederle and Rustichini, 2003; Gneezy and Rustichini, 2004) and are better able to maintain high levels of performance in high pressure situations (Lavy, 2008; Ors, Palomino and Peyrache, 2013). These differences may play a role in explaining the substantial gender pay gap at the top of the income distribution and the large underrepresentation of women in "power" professions (Bertrand and Hallock, 2001). On the other hand, Lavy (2013) finds no gender differences in performance in a tournament in which contestants have more time to prepare and plan their strategies, and Manning and Saidi (2010) argue that gender differences in the incidence of pay-for-performance schemes can account for only a small fraction of the gender gap in the U.K. Paserman (2010) finds that professional tennis players of both genders substantially reduce their performance in high-pressure situations.

Some researchers have argued that women may have other characteristics that compensate for this lack of "competitive spirit." For example, women may exhibit a cooperative personality that gives them a comparative advantage in contexts (such as certain types of negotiations) where such skills translate into superior outcomes for all parties (Babcock and Laschever, 2003). Cooperativeness is usually defined, in contrast to competitiveness, as the aptitude of working or acting together willingly for a common purpose or benefit. The experimental evidence on this subject, based on public good games, ultimatum games and dictator games, is mixed (see Table 3 in Niederle, 2014): comparing 272 studies using pure social dilemma paradigms, Balliet, et al. (2011) find that "the relationship between sex and cooperation in social dilemmas is not statistically different from zero." Croson and Gneezy (2009) suggest that the variance across studies can be explained by a differential sensitivity of men and women to the social conditions in the experiment.

It has been hard to test for gender differences in cooperative behavior outside of experimental contexts, because of the difficulty of measuring cooperativeness. One of the contributions of this paper is to provide evidence on gender differences in cooperativeness from an important real-world setting with high stakes.

3 Institutional Background

The U.S. House of Representatives. The House of Representatives is the lower chamber of the U.S. legislative branch. There are 435 congressional districts, and each state is represented in proportion to population. Elections for all districts occur every two years, with each district electing one representative. The main role of elected representatives is to draft new legislation. Legislation drafted in the House of Representatives must pass both the House and the Senate, and then must be approved by the President before becoming law.

Representatives can pass different types of legislation: bills, simple resolutions, concurrent resolutions, and joint resolutions. A bill can be private or public, depending on whether it has a general application or it only affects a single person, group, or area. Following the tradition in this literature (Wawro, 2001), we focus our attention on Congressional *public bills*, since they have force of law, and are the primary vehicle for members' legislative efforts.[8]

Once introduced, bills are referred to one of 20 committees in the House. A committee decides with majority vote whether to report a bill to the floor or not. Once reported, the bills awaits for floor consideration depending on a schedule decided by the Speaker and other Majority leaders. The bill is then debated, amended, and eventually approved with majority vote. With each new Congress, all pending legislation of the previous Congress expires, so many bills and resolutions are reintroduced.

Bill Sponsorship and Cosponsorship. Each bill has one *primary sponsor*. The sponsor is not necessarily the sole or the most important author of the bill, but he/she is identified with the bill content. The sponsor's activities include, but are not restricted to, gathering and communicating information about the bill, building coalitions, administering public relations around the bill, and shepherding the legislation through the House. Primary sponsorship conveys very important information about individuals' legislative behavior (Wawro, 2001). Schiller (1995) remarks that a "senator's choice of bills is a strong indicator of which issues he or she wants to be associated with."

Since 1978, House bills can be signed by any number of *cosponsors*.[9] Cosponsors typically help the sponsor in promoting the bill, and in attracting support within the Congress. Representatives who are listed as a cosponsor at the time of a bill's introduction are called "initial" or "original", as they possibly contributed to the first draft of the bill. A cosponsor who is added later is known instead as an "additional cosponsor".

There is some debate in the literature about the exact motives for sponsoring and cosponsoring bills (see the discussion in Section 2). Of course, since only 20% of the bills pass the House and 5% eventually become law, some bills only serve the purpose of conveying a signal to voters about the effort that a representative is exerting in Congress, irrespective of whether the bill will become effective or not.

There is general agreement, however, that the sponsor has a strong commitment to make the bill move forward in the legislative process, and that attracting numerous cosponsors can

[8]Joint resolutions also have force of law, but their use is limited to matters such as continuing or emergency appropriations, the designation of a commemorative holiday, or proposing amendments to the Constitution.

[9]H. Resolution 86 (95th Congress).

keep a bill moving through the legislative process.[10] Not surprisingly, a number of studies have found that the number of cosponsors on a bill indeed positively related to the bill's passage probability (Browne, 1985; Wilson and Young, 1997). Accordingly, in our data we find that, after controlling for district and sponsor characteristics, 10 more cosponsors are associated with a 0.67 percentage points increase in the probability that a bill is passed by the House, and with a 0.19 percentage points increase in the probability that a bill becomes law, both correlations being strongly statistically significant.

The interpretation of bill sponsorship by Wawro and others is remarkably close to the concept of cooperative behavior in its common accession. "The tasks and responsibilities of the primary sponsor typically involve entrepreneurial activities, such as *coalition building* and shepherding legislation through the House." (Wawro, 2011, p. 27, our emphasis). Schneier and Gross (1993) remark that the primary sponsor is responsible for discussing the bill with proponents and opponents, and guiding the bill through the legislative process. Campbell (1982) notes that members exert significant effort to recruit members as cosponsors and use the number of diversity of cosponsors to make claims about the support for the legislation.

4 Data

We collect and link data from four different data sources: a) bill sponsorship and cosponsorship data; b) biographical information on members of congress; c) data on electoral results; and d) data on district demographic and economic characteristics. These four data sources will be described in turn.

Bill Sponsorship Data. Using the Library of Congress' data information system, THOMAS (http://thomas.loc.gov), we retrieved information on all bills submitted from the 101^{st} Congress (elected in 1988) to the 111^{th} Congress (elected in 2008). We restrict attention to this time period because the fraction of women in the House of Representatives beforehand was always very low. The information includes the names of the sponsors and cosponsors of the bill; the detailed legislative history of the bill, the committees of referral, reporting and

[10] Wawro (2001) states that "the number of cosponsors that a bill can [attract] ... is indicative of the member's ability to convince others that the bill is worthy of their support."

origin. We also cross-validated this data with other sources, such as Adler and Wilkerson's Congressional Bills Project (http://www.congressionalbills.org) and Fowler, Waugh and Sohn's Cosponsorship Network Data (http://jhfowler.ucsd.edu/cosponsorship.htm). These data sources also provided information on the major and minor topic of the bill, and whether the bill eventually passed in the House, passed in the Senate, and whether it was eventually enacted into law.

Biographical Data. Biographical information on all members of Congress, up the 104th Congress (1995-1997) is available from the Inter-university Consortium for Political and Social Research (ICPSR) at the University of Michigan. Information on subsequent Congresses was retrieved from the Biographical Directory of the United States Congress available online at the Library of Congress (http://bioguide.congress.gov). The information include, among the others, age, gender, tenure in congress, and committee membership of each Congress member.

Election Data. Election statistics for all House districts and Senate seats are available from the Office of the Clerk of the House of Representatives (http://clerk.house.gov). They include the identity and vote share on all winning and losing candidates in each Congressional election from 1920 onwards.

Economic and Demographic Data. Demographic and economic information on congressional districts are available from the U.S. Census Summary Data Files, retrievable through ICPSR. Among the others, they provide time-varying figures on the percentage voters by age, race and gender, plus per capita income.

4.1 Measuring Cooperativeness

A key part of our analysis involves the construction of measures of cooperative behavior based on legislative activity. As we already explained in Section 3, we focus exclusively on House public *bills*, therefore excluding other forms of legislative activity such as simple and concurrent resolutions, which are often used more for pure position-taking and can have little legislative impact.

Using bill sponsorship and cosponsorship data, we calculate two main measures of cooperative behavior: a) The number of cosponsors on bills sponsored, which can be used as a measure of coalition-building ability, both within and across party lines; and b) the percent of cosponsors from the opposite party out of the total number of bill supporters (i.e., the number of cosponsors plus the bill sponsor).[11] The latter measure captures the degree to which congress members are able to generate policy initiatives that are supported, at least initially, by members of the opposite party. It is worth remarking that, regardless of one's position on why members choose to cosponsor bills, introducing legislation that garners support from the other side of the aisle is undoubtedly indicative of cooperation across party lines.

Notice that both measures can be thought of as measures of proactive cooperative behavior, in the sense that they capture the extent to which members of Congress initiate and promote legislation that will receive broad or bipartisan support. We focus on these measures, as they are more likely to reflect the sponsoring Congress member's active efforts. A second advantage of this approach is that it allows us to conduct all the analysis at the level of the Congressional bill, and therefore enables us to study whether the degree of cooperativeness is affected by specific characteristics of the bill.[12]

5 Theoretical Framework

In this section we describe a stylized model of a legislator's choice of the content of a bill for which he/she acts as a sponsor, and of the effort in recruiting cosponsors. The aim of the model is to guide the interpretation of our main empirical findings. To this purpose, we will provide some comparative statics for how individual cooperative skills and ideological

[11] We divide by the total number of cosponsors including the bill sponsor (i.e., the number of cosponsors plus one) so as not to lose observations for bills that have zero cosponsors. All the results are qualitatively unchanged if we divide just by the number of *cosponsors*, i.e., treating as missing values bills with zero cosponsors; or if we use as dependent variable the *number* of opposite-party cosponsors, and include the number of sponsors as a right-hand side control variable in the regressions.

[12] Alternatively, one can also think of the correspondent measures of reactive cooperative behavior: the number of bills on which one acts as a cosponsor, which tells us about the willingness of Congress members to lend their support to initiatives sponsored by others, both within and across party lines; and the number of bills cosponsored in which the primary sponsor belongs to the opposite party. Harbridge (2015) uses cosponsorship by members of the opposite party to that of the primary sponsor as her main measure of bipartisanship. Most of our results carry through also when we use these reactive measures (results available upon request).

preferences affect the number and type of cosponsors.

5.1 Basic Model

We assume that the choice variables for a legislator are $x \in [-1, 1]$, the chosen policy on a Left-Right spectrum, and n, the number of cosponsors. We also assume that the probability of a bill being approved is increasing both in n and h, which measures the *proximity* of the policy to the median legislator m, such that:

$$h \equiv h\left(-\frac{1}{2}(x-m)^2\right) \tag{1}$$

with $h' > 0$, and more moderate bills having a higher probability of being approved. Legislator i maximizes the probability of the policy being implemented minus a cost, his/her utility function being:

$$U = f(n, h) - c_i n - \frac{a_i}{2}(x-b_i)^2 \tag{2}$$

where c_i is the cost of recruiting cosponsors (i.e., the "ability to foster cooperation"), b_i is the ideal policy (i.e., his/her position on the ideological spectrum), and finally a_i is the cost of deviating from the ideal policy (i.e., the "willingness to compromise ") for legislator i.

Without loss of generality, we assume that $b_i > m$, i.e., the legislator is right-wing. We also assume that the probability of a policy being implemented is increasing in both arguments at decreasing rates, i.e. $f_1 > 0$, $f_2 > 0$, $f_{11} < 0$, $f_{22} < 0$. Finally, we assume that $f_{12} \leq 0$, meaning that the marginal value of an additional cosponsor is greater the more extreme is the policy.

We do not explicitly model *which* cosponsors are recruited. However, we can assume, somewhat loosely, that cosponsors are more likely to support a bill that is closer to their own ideal policy position. This implies that a more moderate bill (i.e., a small $|x_i - m|$) is likely to obtain more support from cosponsors of the opposite party.

Given this setting, it is easy to derive the following first order conditions:

$$\begin{aligned} f_1 - c_i &= 0 \\ -f_2 h'(x-m) - a_i(x-b_i) &= 0 \end{aligned}$$

where the second equation can be rewritten as:

$$x = \frac{f_2 h' m + a_i b}{f_2 h' + a_i} \tag{3}$$

i.e., the optimal x^* is a weighted average of m and b_i.

Our data lend support to the model's assumptions. Column 1 in Table 1 shows that the probability of a bill passing the House is increasing in the number of cosponsors (n) and in the percentage of cosponsors from the opposite party (a proxy for x), while the interaction between the two is negative and significant. The latter coefficient implies that when a proposed policy is more extreme, cosponsors can be more valuable in gathering consensus towards the bill. An important assumption in our model is that the marginal effect of the number of cosponsors and the fraction of cosponsors of the opposite party is the same for men and women. We test this assumption in Column 2 of the table, where we interact the explanatory variables with a dummy for the sponsor's gender. Of the three interaction coefficients, only one is marginally significant (at the 10% level), and the joint hypothesis that all three coefficients are equal to zero is not rejected (p-value = 0.12).

5.2 Comparative Statics

Here we analyze the comparative statics of n^* and x^* with respect to the model parameters. Taking the first derivative of n^* and x^* with respect to c_i, b_i and a_i, and under the assumption that $f_{12} \leq 0$, we obtain the following Proposition (see Appendix A for a proof):

Proposition 1 *Without loss of generality, for a right-wing legislator ($b_i > m$) the following results hold:*

1. ***Coalition building***. *a)* $\frac{\partial n^*}{\partial c} < 0$; *b)* $\frac{\partial n^*}{\partial b} > 0$; *c)* $\frac{\partial n^*}{\partial a} > 0$.

2. ***Bipartisanship***. *a)* $\frac{\partial x^*}{\partial c} < 0$; *b)* $\frac{\partial x^*}{\partial b} > 0$; *c)* $\frac{\partial x^*}{\partial a} > 0$.

Some of these results have a straightforward intuition. For example, legislators will build larger coalitions if the cost of recuiting cosponsors is smaller (result 1.a); and legislators sponsor policy initiatives that are farther away from the median voter if their own ideal preferences are distant from the median voter (result 2.b), or if it is costly for them to deviate from their ideal policy (result 2.c). The other results depend on the assumption that $f_{12} \leq 0$: if one's ideal policy is more extreme, or if it is costly to to deviate from one's policy, then one must garner more cosponsors to raise the probability that the bill passes (results 1.b and 1.c); similarly, if it is costly to recruit cosponsors, then one must compensate by introducing a more moderate bill.

One first implication of Proposition 1 is that, if women are better at fostering cooperation ($c_F < c_M$), we should observe that they recruit more cosponsors, but they should also recruit a smaller fraction of cosponsors of the opposite party, since they can sponsor a less moderate bill. Similarly, if women are more willing to compromise than men ($a_F < a_M$), they should be able to recruit a larger fraction of cosponsors of the opposite party by sponsoring a more moderate bill, in which case they need a fewer number of cosponsors. These results should hold in both parties.

On the other hand, the effect of being more ideologically extreme should differ by party, as the preferences of female Republicans are closer to the median relative to their male counterparts, while those of female Democrats are farther away from the median. This can be seen in Figure 1, where we show the empirical c.d.f. of the predicted Republican vote share in districts represented by male and female Congress members, separately by party.[13] Among Republicans, the c.d.f. for men first-order stochastically dominates that of women. Among Democrats, there is clear evidence that women are more likely to represent districts with low predicted Republican shares, but the distributions end up slightlly overlapping in districts with a higher predicted Republican vote share. We can conclude that female representatives of both parties tend to be elected in more liberal districts.

This difference in the characteristics of constituencies that elect men or women is also reflected in the Congress members' roll-call voting behavior. In Figure 2, we report the c.d.f. of the first dimension of the DW-NOMINATE score by gender and party: for both parties, women's ideological preferences lie to the left of those of the men within their own party.

[13] The predicted Republican vote share is obtained by running an OLS regression of the actual Republican vote share on a vector of district characteristics, including three region dummies, ppercentage blacks, percentage urban, percent foreign born, percent over 65, log median income and log population density.

A similar pattern can be detected in Figure 3a, where we report the Party Unity Score by gender and party:[14] female Democrats tend to vote more often with their party than their male colleagues, while the opposite is true for female Republicans. Under these conditions, we should observe that female Democrats are less moderate in their policy making than male Democrats, and therefore recruit a smaller fraction of cosponsors of the opposite party, while the opposite applies to female Republicans. This, in turn, should imply that female Democrats recruit more cosponsors to compensate for sponsoring a less moderate bill, and female Republicans fewer.

Summing up, the model delivers sharp predictions on the effect of a female sponsor on the number of cosponsors n^*, and the chosen policy position x^* (which maps one to one with the fraction of cosponsors of the opposite party), depending on which parameter is responsible for the gender differences. These predictions are summarized in the following table:

	n^*		$\|x^*\|$	
	D	R	D	R
$c_F < c_M$	+	+	+	+
$a_F < a_M$	-	-	-	-
D: $\|b_F\| > \|b_M\|$ R: $b_F < b_M$	+	-	+	-

Note: A "+" sign indicates that the theory predicts that female Congress members will have a higher value of the relevant variable. A "-" sign indicates that female Congress members will have a lower value.

[14] The Party Unity Score is the fraction times that a Congress member votes with his or her own party in divisive roll-call votes, i.e., votes in which a majority of Democrats vote differently from a majority of Republicans.

6 Preliminary Evidence

6.1 Summary Statistics and Trends

We start by showing some basic trends on the gender composition of the House of Representatives. Figure 4 shows trends in the fraction of female Congress members, overall and separately by party. The fraction of women in the House has risen from about 7% to 17% over our sample period, but there are important differences between the parties. In fact, while in 1988 Republicans had a slight advantage in the fraction of female representatives, by the end of the sample period a substantial gap had developed in favor of Democrats.

Table 2 presents some basic summary statistics about our sample, including the main dependent variables of interest. The top panel presents summary statistics for Congress members, and the bottom panel for bills. We first refer to the first three columns, which present statistics for both parties pooled together. Women represent 12.8% of Congress members during our sample period (first row of Panel A), but they sponsor 14.0% of Congressional Bills (first row of Panel B). This is because on average, women sponsor 14.5 bills per Congress, while men sponsor 12.5 bills. The distribution of the number of cosponsors is heavily skewed to the right: the mean number of cosponsors on a bill is 17, but the median number of cosponsors is 3 (Panel B). Female-sponsored bills tend to attract a larger number of cosponsors (true for both the mean and the median). On the other hand, female-sponsored bills have fewer cosponsors of the opposite party. Most of these patterns are replicated when one looks separately by party, with one notable exception: Democratic women tend to attract a smaller fraction of cosponsors from the opposite party, while the opposite is true for Republican women.

Figure 5 presents trends in our two measures of cooperative behavior. Figures 5a looks at the measure of coalition-building: the mean number of cosponsors per bill. The series exhibits a drop between 1988 and 1994, a rise between 1994 and 1998, and then stays relatively constant. Notably, in every year the number of cosponsors on female-sponsored bills is substantially higher than that on male-sponsored bills.

Figure 5b looks instead at the measure of bipartisanship: the percent of cosponsors from the opposite party. The series exhibits an overall downward trend, consistent with the notion of an increasing polarization in the U.S. Congress. The decline is sharper in the later years, and also more pronounced for women.

6.2 OLS Results

The basic descriptive statistics presented above show that there are substantial gender differences in the ability to attract a large number of cosponsors. There are also gender differences in the ability to attract cosponsors from the opposite party, but the sign of this difference is party-specific, with Democratic women attracting less bipartisan support, and Republican women attracting more bipartisan support. We now investigate through a series of OLS regressions how these raw differences are affected once we control for the characteristics of the bill, of the sponsors, and of the socioeconomic characteristics of the districts that they represent. The basic model is the following:

$$Y_{ijkt} = \alpha + Female_i + c_t + Bill_j + Spons_{it} + Distr_{kt} + \epsilon_{ijkt} \tag{4}$$

where Y_{ijkt} is either the total number of cosponsors or the percent of opposite-party cosponsors on bill j sponsored by congressman i, elected at time t in district k. Finally, ϵ_{ijkt} is an idiosyncratic error term, which for the moment is assumed to be uncorrelated with the other regressors.

The results are presented in Table 3. The top panel looks at the effect of sponsor gender on the total number of cosponsors, while the bottom panel looks at the percent of opposite-party cosponsors. Each panel shows the results for all congress members pooled, and then separately by party. Each column progressively adds more controls, allowing us to observe how the coefficient on the female dummy changes with the inclusion of more control variables. The first column is the most basic specification, where we control only for congress (i.e., time) fixed effects. The coefficients simply reflect the findings from the descriptive statistics in Table 2: female-sponsored bills attract more cosponsors, and this is true for both Democrats and Republicans. On the other hand, the effect of gender on bipartisanship differs by party: among Democrats, women attract less bipartisan support, but the opposite is true among Republicans. All the above differences are statistically significant at conventional significance levels.

The first obvious explanation for this gap is that male and female representatives engage in different types of legislation, with women more likely to sponsor bills in areas in which large coalitions are possible, or in which the typical Democrat is more distant from the median position of the House, while the median Republican is closer. Column (2) shows that there is some basis to this argument. Once we control for a set of bill category dummies, almost all coefficients are attenuated, sometimes by as much as 30-50 percent.[15]

Next, we explore the possibility that the gap is explained by differences in the individual characteristics of Congress members. Female representatives in general have served in Congress for fewer terms, but are slightly older, and differ from male representatives in their educational and occupational background. In Column (3) we control for Congress member tenure, a dummy for whether the member is a rookie, the member's age, a dummy for whether the member is the chair or the ranking member of a committee, a dummy for having attended an Ivy League college, and five previous occupation dummies. We also control for total number of bills sponsored, to exclude the possibility that cooperation may simply reflect a different degree of activism within Congress. Perhaps surprisingly, the coefficient on the female dummy tends to increase with the inclusion of these individual-level controls. This indicates that on average female representatives tend to have individual characteristics that are *negatively* correlated with the number of cosponsors and with the percentage of opposite-party cosponsors. For example, rookie Congress members tend to recruit fewer cosponsors, and fewer opposite-party cosponsors.

In Column (4) we look at how coefficients are affected when district characteristics (but not individual characteristics) are controlled for. The characteristics included in the regression are three macro area dummies, the percent of the population that is black, urban, foreign-born, and above age 65, log median income, and log population density. Now, we find a strikingly large drop in all the coefficients, for both outcome variables. This implies that women tend to be elected in districts with characteristics that are associated with a

[15]We assigned each bill to one of 226 mutually exclusive minor topics, based on the classification of *www.congressionalbills.org* (Adler and Wilkinson, various years), and to one of the 33 committees of referral, to capture the importance of the bill.

large number of cosponsors. The pattern of coefficients on the bipartisanship measure in the bottom panel further suggests that women are elected in districts with characteristics typically associated with a more liberal political orientation.

Finally, Column (5) includes controls for all bill, individual and district characteristics. In terms of sign and statistical significance, the regression-adjusted coefficients in this column are almost always the same as the raw coefficients in Column (1), but they tend to be smaller in magnitude.

However, it would be inappropriate to conclude on the basis of these results that gender is causally related to cooperative outcomes. Specifically, the pattern of coefficients in Table 3 clearly indicates that gender is correlated with observed district characteristics. This raises the concern that gender may also be correlated with unobserved district characteristics, and if one could control for these additional variables, all the gender differences would disappear.[16] In what follows, we discuss the different econometric approaches that we employ to address these potential biases.

7 Addressing Selection

7.1 Empirical Methodologies

Two results emerge from the OLS analysis described above: a) controlling for individual and district characteristics affects the coefficients, sometimes in important ways; and b) there are important differences by parties. The OLS estimates rely on the assumption that, conditional on all of the observed individual and district characteristics, the gender of the elected representative is as good as randomly assigned. However, there are reasons to be skeptical of this assumption. For example, assume that women are more likely to run and be elected in contested districts (as would be the case if women are predominantly "new" to the political scene, and are therefore less likely to have accumulated a significant incumbency advantage). Presumably, representatives from contested districts have stronger incentives to demonstrate to voters that they have been active and that they have been able to garner

[16] We have also experimented with specifications in which we control for district fixed effects. However, since there is relatively small within-district variability in the gender of Congress members, these regressions yielded highly imprecise and uninformative estimates.

broad support for their policy initiatives. In terms of bipartisanship, representatives from contested districts must reach out to the opposite party to appeal to the key centrist voters, while the opposite is true if representatives from contested districts need to polarize their legislative activity in order to appeal to their core partisan base.

Therefore, one would want to control more explicitly for how strongly contested an electoral district is. An approach that has become quite popular in the empirical political economics literature is to adopt a Regression Discontinuity (RD) design. That is, one would focus only on representatives elected in districts that had a mixed-gender electoral race that was decided by a narrow margin. The key idea behind RD is that in close races between a male and female candidate, the identity of the election winner is determined by random factors occurring on election day, essentially randomizing the gender of the elected representative.[17] The OLS model is then augmented as follows:

$$Y_{ijkt} = \alpha + Female_i + Female_i * f(MV_{ikt}) + f(MV_{ikt}) + c_t + \epsilon_{ijkt} \tag{5}$$

where $f(MV_{ikt})$ is a function of the margin of victory of a female candidate against a male candidate.

However, in our setting, one must exercise caution. The OLS results clearly illustrated that there are important differences by party. Therefore, we would like to conduct our analysis not only for the sample as a whole, but also within each party. However, when conducting an RD design separately by party, the key identifying assumption may come into question. For example, suppose, without loss of generality, that we are interested in the effect of gender within the Republican party. In an RD setting, we effectively compare close races in which a female Republican defeats a male Democrat to races in which a male Republican defeats a female Democrat. In general, there is no longer any guarantee that electoral races on the left and the right of the threshold represent the "same races", whose outcome is determined by random factors occurring on Election Day. We are comparing two sets of races that come potentially from a very different pool.

[17]Some recent studies argue that, despite the appeal of the RD design, there may in fact be systematic differences between winners and losers of close elections (Caughey and Sekhon, 2011). However, analyzing more than 40,000 close races in a variety of settings, Eggers et al. (2015) conclude that the assumptions behind the RD design are likely to be met in a wide variety of electoral settings.

To illustrate the problem, it is instructive to look at the density of the margin of victory of the female candidate in mixed-gender electoral races, overall and separately by party (Figure 6). The top panel of the Figure shows the density of the running variable for all races pooled together. The density to the left of the threshold is slightly higher than that to the right of the threshold, indicating that male candidates are slightly more likely than female candidates to prevail in mixed-gender elections, even though a McCrary test does not formally reject the null of no discontinuity at the threshold. [18] However, when we break the sample by party, the picture changes substantially. Among Democrats, it is actually female candidates who are slightly more likely to win in contested elections. Among Republicans, however, there is strong evidence of a discontinuity in the density at the threshold, with male candidates enjoying a marked advantage. It is important to remember how these density estimates should be interpreted: if we only look at elected Republicans in mixed-gender elections, we are comparing male Republicans who defeated a female Democrat to female Republicans who defeated a male Democrat. In general, there is no reason to believe that these elections come from the same "pool," and in fact Figure 6 illustrates that the former set of elections is much more numerous than the latter. Given this difference, it is likely that the characteristics of the candidates and the districts are also different on the two sides of the threshold.

Where does this leave us with respect to the RD exercise? One must recognize that when conducting an RD analysis conditional on party, we are essentially performing a very specific type of matching exercise. We have two groups of elections, potentially quite different, and we try to find elections from each group that that are very similar to each other with respect to one important variable: the margin of victory of the female candidate. Moreover, we are trying to match elections for which the margin of victory of the female candidate is close to zero. This of course does not guarantee that the other district and individual characteristics are balanced at the threshold.

To illustrate this point, in Table 4 we report the standardized difference for a number of district and individual characteristics between female and male representatives. The first

[18] It is likely that much of this advantage is due to an incumbency effect.

three columns focus on all representatives, the second three look only at elected Democrats, and the last three at elected Republicans. Following Imbens and Wooldridge (2009), the standardized difference is calculated by dividing the difference in means between the groups by the square root of the sum of the variances. This normalized difference provides a scale-free measure of the difference in the distribution of covariates between the two groups. Imbens and Wooldridge suggest as a rule of thumb that a standardized differences exceeding 0.25 is evidence of poor balance between the covariates, and linear regression methods generate estimates that can be highly sensitive to the exact specification.

Columns (1), (4) and (7) report the raw standardized differences in the full sample (Column 1) or the party-specific samples (Columns 4 and 7). Columns (2), (5) and (8), instead, report the standardized difference obtained using an RD design. That is, we take all mixed-gender elections in which the absolute value of the margin of victory does not exceed 25, and run a linear regression of the relevant covariate on a gender dummy and the margin of victory of the female candidate, allowing the slope to differ on either side of the threshold. The number in the table is the estimated coefficient on the gender dummy ("the RD estimate") divided by the same square root of the sum of variances used to calculate the standardized difference in the first column. In essence, this number tells us the extent to which the covariates are balanced at the threshold in mixed-gender electoral races. It is readily apparent that the covariates that were unbalanced in the raw sample continue to be unbalanced in the RD sample, especially when looking at the parties separately.

Despite these shortcomings, we still see some value in showing RD results. The reason is that, if we do actually have two elections that are very close to each other in terms of observables, and in which the gender of the elected representative can be essentially thought of as randomly determined, this would tell us quite cleanly what the effect of gender is. To reduce the problem of imbalance in the covariates, we augment the RD design with a propensity-score based procedure. Specifically, we proceed in the following steps: a) we first estimate a simple RD regression, and calculate the optimal bandwidth, based on the procedures described by Calonico et al. (2014); b) for observations within this optimal bandwidth, we estimate the propensity score, i.e., the probability of electing a female representative conditional on all district characteristics; c) we then reestimate the RD regression, but weighting observations by the inverse of the estimated propensity score. The rationale for this estimator is that it puts more weight to observations of female representatives who are elected in districts in which the probability of electing a man was relatively high, and to observations of male representatives elected in "female-friendly" districts.

In addition to the RD design described above, we also implement a more traditional propensity-score based method. Having recognized that the RD design can be thought of as a very particular form of a matching estimator, it makes sense to extend the matching logic and compare districts that are as similar as possible in all observable characteristics, including the margin of victory of the winning candidate. Notice that when following this approach, we no longer require to focus only on mixed-gender electoral races. It is very possible that the nearest neighbor to an electoral race won by a woman is a an electoral race in which no woman was running.

In practice, we pool all electoral races together (for the full sample, and separately by party) and estimate the probability of electing a female representative as a function of all observable district characteristics, including the margin of victory of the elected candidate. We then estimate the treatment effect on the outcome of interest by running a weighted least squares regression of the outcome of interest on the gender dummy, weighting observations by the inverse of the propensity score.[19]

Columns (3), (6) and (9) of Table 4 show the standardized differences in covariates obtained by weighting observations by the inverse of the propensity score. As expected, all the district characteristics that are unbalanced in the raw sample become balanced when we use inverse-propensity score weighting. However, the individual member characteristics (bottom panel of the Table), which were not used to construct the propensity score, continue to be unbalanced.

The question of whether one should match only on district characteristics, or also on individual characteristics is a conceptual one, to which there is no unambiguous answer. When we match on district characteristics only, we essentially ask the question: "What is

[19]While there are a variety of other propensity-score based methods, we choose the inverse-probability weighting method as it makes the comparisons across different estimators most straightforward.

the effect of electing a female representative?" allowing for the possibility that women who run for office are different in their observable characteristics (age, education, tenure in office, etc.) from their male counterparts. On the other hand, if we match on both district and individual characteristics, we are asking more specifically about differences in behavior that are due exclusively to gender, holding all other characteristics constant. This is in itself an interesting question that addresses directly the research question of gender differences in cooperative behavior, but is perhaps less relevant from a policy point of view. For example, if one wants to implement a policy of having more women run for Congress, the pool of candidates would likely be more similar to the average woman currently serving, rather than an ideal woman who is similar in everything to her male colleagues except for her gender. For this reason, in the analysis that follows we present both sets of results: when the propensity score is based only on district characteristics, and when it is based on both district and individual characteristics.

7.2 Results

In the top panel of Table 5 we report the coefficient estimates on the gender dummy in a series of regressions where the dependent variable is the number of cosponsors on a bill. In the first column, we include in the sample all available bills, and run a simple OLS regression of the number of cosponsors, a gender dummy, plus a full set of sponsor, bill and district characteristics. This specification corresponds to the one in Column (5) of Table 3. In Column (2) we control linearly for the margin of victory of the female candidate in mixed-gender electoral races, allowing for different slopes on the two sides of the discontinuity point within the optimal bandwidth.[20] Thus, the gender dummy captures the difference in the height of the regression function at the threshold, i.e., the effect of electing a female representative in a tightly contested electoral race. To account for the potential unbalance of district characteristics in mixed-gender electoral races as highlighted in Table 4, in Column

[20]In all our analysis, an observation is an individual bill. However, the forcing variable varies only at the congress/district level. In calculating the optimal bandwidth, one can either aggregate all variables at the congress/district level, or treat individual bills as distinct observations. We choose the latter method to better reflect the fact that some congress members are more active in sponsoring legislation. The results are qualitatively unchanged if we had used the alternative method.

(3) we then reestimate the RD regression, but weighting observations by the inverse of the estimated propensity score based on district characteristics. Finally, in the last two columns we switch back to the sample of all electoral races to implement a propensity-score matching based on district characteristics and the margin of victory (Column 4), and additionally on sponsor characteristics (Column 5).

Compared to the simple OLS estimates in Column (1), the results become a bit more noisy when we control for the margin of victory using our modified RD design (columns 2 and 3). The propensity score estimates in Columns (4) and (5) have the same sign and statistical significance as the OLS estimates, but become somewhat smaller in magnitude. The conclusion from this table is that there are no substantial gender differences in the ability to foster cooperation over the entire sample, neither in the RD specifications, nor in the PS ones. However, the gender gap in coalition building among Republicans is fairly substantial and is robust to the treatment of selection. On the other hand, the weight of the evidence is that there is no significant gender difference among Democrats in the number of cosponsors recruited.

Panel B of Table 5 looks instead at our main measure of bipartisanship: the dependent variable is the percentage of cosponsors from the opposite party. When looking at the sample as a whole, there appears to be no meaningful gender differences, neither in the RD specifications, nor in the PS ones. The split by party, however, confirms the interesting contrasts between Democrats and Republicans that we had already documented in Table 3. The magnitude of the estimates is somewhat sensitive to the exact specification used, but there is clear evidence that female Republicans are more bipartisan relative to their male Republican colleagues (about +20% over an average of 27 percentage points), and female Democrats less. The gender gap becomes even larger in the RD specifications, but is not always estimated precisely for Republicans. [21]

[21] It is worth mentioning another exercise that we ran to address the bias introduced in the RD estimates by party. As discussed in Section 7, when focusing on parties we are comparing two sets of races that come potentially from a very different pool. This should not be the case, however, in primary elections. The assumptions necessary for RD are more likely to be satisfied when a male Republican runs against a female Republican, or a male Democrat runs against a female Democrat. Unfortunately, to implement an RD exercise on primary elections we need to focus not only on mixed-gender primary elections decided by a small margin, but also on districts where one of the two parties ran for a safe seat, i.e., where the party won

In terms of the theoretical model described in Section 5, the results on bipartisanship indicate that female Congress members have policy preferences that are shifted to the left relative to their male party colleagues. It is remarkable that we still find a pattern of results that is consistent with this notion, even after we control extensively for potential selection of male and female representatives into different types of congressional districts. The differential patterns in bipartisanship across parties is strong evidence that women are not inherently more willing to move to the center in terms of the bills that they sponsor. As for the number of cosponsors recruited, there is some evidence that women have inherently lower costs of recruiting cosponsors, but this result is robust only for Republicans. The results cannot be rationalized by differences in policy preferences within party, as these predict that Republican women, being more moderate, would recruit a *smaller* number of cosponsors. In what follows, we probe further into these differences.

7.3 Interpretation

The number of cosponsors. We have documented that female Congress members tend to recruit a larger number of cosponsors, with the effect being mostly driven by female Republicans. While the results could be suggestive, at least partially, of intrinsic differences in the ability to induce cooperation, other factors could also be at play. One possibility is that women need to recruit a larger number of cosponsors because they are less able to recruit influential cosponsors that can help push forward their legislative initiatives. In Tables 6a and 6b we investigate whether there is such a "quality-quantity" trade-off in recruiting cosponsors, i.e., whether the cosponsors recruited by female Congress members are less valuable than those recruited by men.[22] If true, this could offset the advantage of women in recruiting cosponsors.

In the top panel of Table 6a we first look at whether female Congress members recruit more female cosponsors on their bills. There seems to be evidence that women have an

by more than 20 percentage points in the following general election. By doing so, we are left with only 185 races, which are not sufficient to run a meaningful exercise. Still, estimates on this subset of races delivers less precise but similar numbers to those in Table 5.

[22]The structure of this and all subsequent tables is the same as that of Table 5. Given the large differences by party uncovered earlier, from here onwards we only present results disaggregated by party.

advantage in recruiting other women in almost all the specifications (+20% over an average of 14 percentage points), although this advantage is no more significant in the RD specification with PS matching. Other than recruiting more women, however, there do not appear to be any other substantive gender differences in the quality of cosponsors recruited. In the middle and bottom panel of Table 6a we look in fact at the percentage of high-ranked cosponsors, i.e., those who chair a committee and those with high tenure in Congress. We do not find any significant disadvantage for women in recruiting leader cosponsors, nor Congress members who have served for more than 5 terms in Congress.

In Table 6b we look at additional measures of cosponsor quality. With data on the identity of all sponsors and cosponsors on each congressional bill, we can map the entire network of bill sponsorship in Congress, and calculate for each Congress member various measures of network centrality. In the top panel of Table 6b we look at degree of betweenness centrality in terms of cosponsorship.[23] There are no meaningful differences by gender among Republicans, while there is some evidence that female Democrats tend to recruit slightly less central cosponsors in the OLS and PS specifications. Finally, we investigate the possibility that female Congress members recruit large coalitions to compensate for a potential difficulty in recruiting ideologically *diverse* coalitions. To do this, in the bottom panel of Table 6b we look at the variance of the first dimension of the DW-NOMINATE score among cosponsors.[24] There is only mixed evidence for this hypothesis among Democrats, and nothing at all for Republicans. Given that it is mostly among Republican women that we observe a significant advantage in recruiting cosponsors, we conclude that there is little support for the existence of a quantity/quality tradeoff in the type of cosponsors recruited.

Another concern is related to the possibility that women need to recruit more cosponsors to compensate for their lack of experience, or to fight discrimination among voters and colleagues (Anzia and Berry, 2011). According to this hypothesis, female Congress members need to be particularly hard-working to signal to voters and male Congress members that they are qualified for the job. If this were the case, we would expect the gender gap in

[23]Betweenness centrality is defined as the number of times a Congress member acts as a link between two other members in the network of cosponsorship, normalized between 0 (lowest) and 1 (highest).

[24]The variance is computed including the main sponsor, so that we don't lose any observations.

the number of cosponsors recruited to be more prominent among less experienced Congress members, because it is the inexperienced women who are most likely to be discriminated against. We look at this possibility explicitly in Table 7, where we divide the sample by tenure in Congress (members with more and less than 5 terms). Contrary to the discrimination hypothesis, we find that the positive gender gap highlighted in Table 5 only appears among the most experienced Congress members.

In Table 8 we repeat the previous analysis but focusing on bills that are possibly more related to women's interests. Following the discussion in Section 5, we expect that women might need more cooperation on issues that are closer to their bliss point, but farther from those of men. We follow the previous literature and define a bill as related to "women's issues" if it has a major topic in Health, Labor/Employment/Immigration, Education, Law/Crime/Family or Social Welfare.[25] Results in Table 8 shows that female Republicans are slightly more effective in recruiting cosponsors when the bill is related to women's interests, while there are no significant gender differences among Democrats.

Percent Cosponsors from the Opposite Party. We now turn our attention to understanding the mechanisms behind the gender differences in the percentage of cosponsors from the opposite party. The discrimination hypothesis posits that women may seek to sponsor more bipartisan bills, in order to overcome the skepticism of voters and colleagues. Again, we find little support for this hypothesis: Table 9 shows that the positive gender gap highlighted in Table 5 only appears among the most experienced Congress members. On the other hand, Table 10 reveals stark differences by bill type in the extent of bipartisanship. The large bipartisanship gap on the Republican side is driven almost exclusively by bills related to women's issues. The effect is quite large: bills on women's issues sponsored by female Republicans attract about 6 percent more Democrats than similar bills sponsored by their male counterparts (a 20% effect with respect to a mean of 32 percentage points). On the Democratic side, the opposite is true: the bipartisanship gap on women's issues is small and mostly insignificant, while it is more pronounced on all other bills.

[25] We also tried with a second classification, where we define a bill as related to "women's issues" if the bill has a minor topic which ranks in the top 25% by the fraction of female sponsors. Results are very similar in magnitude and statistical significance, and they are available upon request.

We interpret the fact that female Republicans recruit significantly more opposite-party cosponsors, especially when it comes to bills related to women's interests, as the result of a lack of support within their own party. This is in line with the predictions of the model we highlighted in Section 5: on women's issues, it is likely that female Republicans are even closer to the median than male Republicans, as can be also seen from their roll-call behavior (compare Figures 3a and 3b).

Probability of Bills Passing the House. It is natural to ask how these differences in the number and type of recruited cosponsors affect the way in which bills advance through the legislative process. In our data, we find evidence that bills sponsored by female Democrats are slightly less likely to pass the House (a 1.5 percentage point difference, relative to a mean of about 17%), while there are no meaningful gender differences among Republicans (female sponsored bills are 0.4 percentage points more likely to pass the House, relative to a mean of about 21%).[26] Accounting for differences in the number and type of cosponsors can explain about 16% of the gender difference among Democrats, and more than 100% of the (tiny) gender difference among Republicans – the difference becomes a negative 0.1 percentage points. It appears therefore that differences in patterns of cosponsorship do not give women a significant advantage in legislative effectiveness. This is not too surprising: the probability of a bill passing the House depends primarily on the underlying political equilibrium in Congress, and only marginally on sponsor characteristics and activities (going back to Table 1, while the effects of the number of cosponsors and the fraction of cosponsors of the opposite party are highly statistically significant, they explain only a small fraction of the total variation in the dependent variable).

8 Conclusion

In this paper we have studied gender differences in cooperative behavior in an important real-world setting with high stakes. In addition, we contributed to the understanding of cooperative behaviors and bipartisanship in the U.S. Congress.

[26]These results are in contrast to those of Volden et al. (2013), who find that female Congress members have higher legislative effectiveness. However, their measure of effectiveness is a composite index that takes into account also the number of bills sponsored and how bills advance through committees.

Our main result is that, after controlling for the characteristics of the district in which they are elected, and in particular the electoral margin of victory, there is little evidence to suggest that women are inherently more cooperative or bipartisan. However some differences emerge when one conducts the analysis separately by party. Even after controlling for selection into different electoral districts, female Republicans tend to recruit a larger number of cosponsors, and more cosponsors from the opposite party. These differences are most pronounced on topics that are closer to women's interests. This party difference might be explained by the lack of support for female Republicans within their own party, with Democrats being more available for cooperation on those subjects than male Republicans. Among Democrats, we find no gender difference in the number of cosponsors, but female Democrats are less likely to sponsor legislation that attracts bipartisan support.

Overall, our results suggest that differences in cooperative behaviors by gender are perhaps not as large as expected. Gender differences in cooperation arise when women strategically compromise to achieve a common goal, rather than because women are intrinsically more cooperative. It appears therefore that an increase in female representation is unlikely to lead to a substantial increase in cooperation in Congress.

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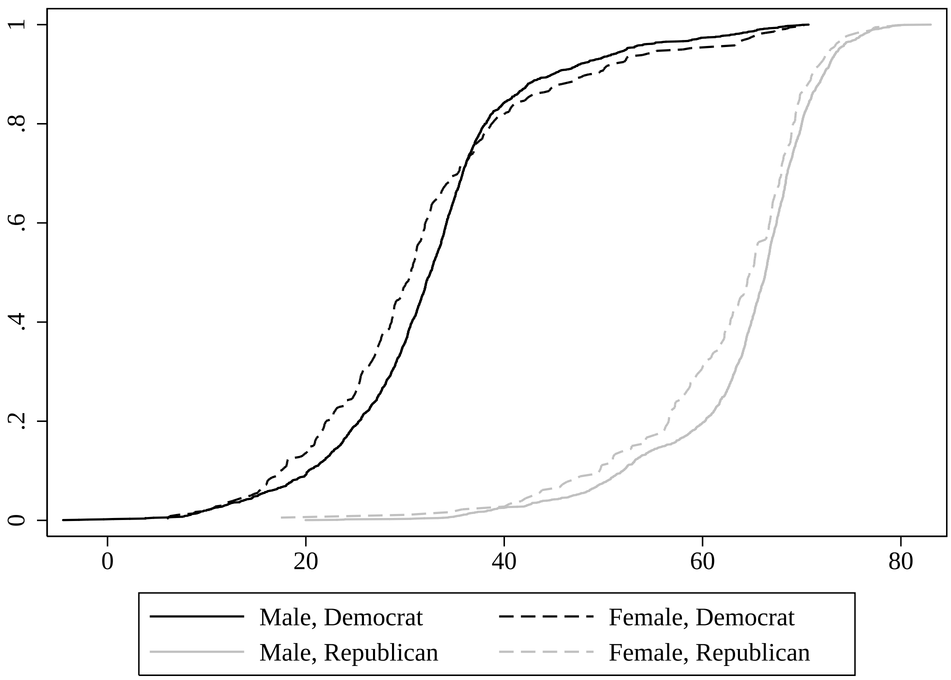
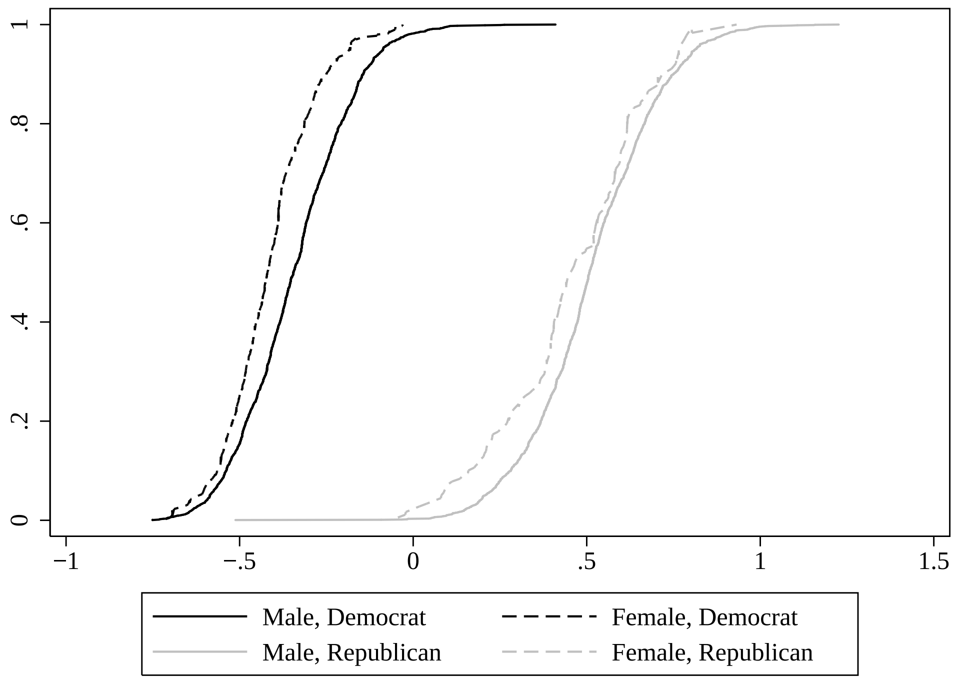
Figures and Tables

Figure 1: Predicted Republican Share (c.d.f.)



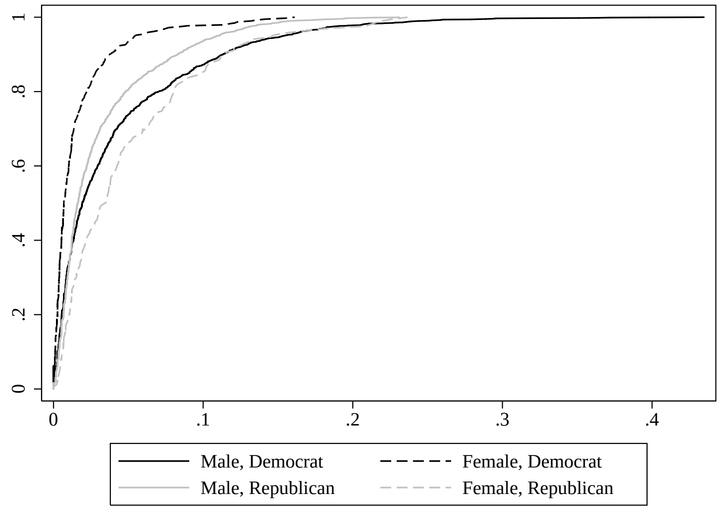
Notes. The unit of observation is an individual-congress member.

Figure 2: DW-Nominate (c.d.f.)



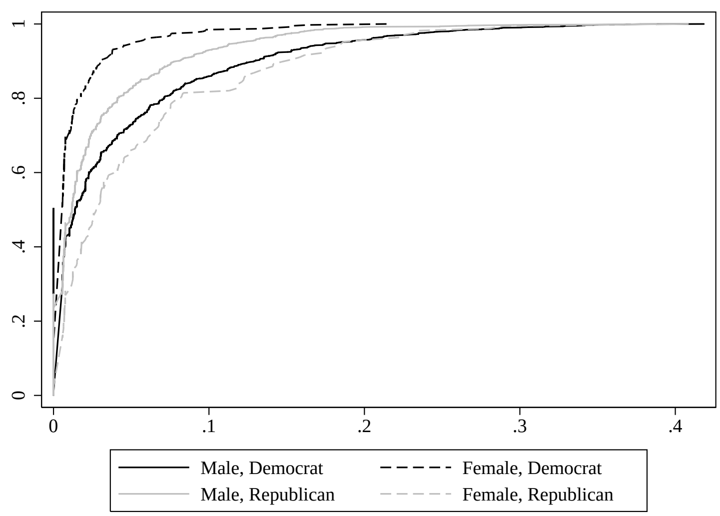
Notes. First dimension of the DW-NOMINATE score as defined in Poole and Rosenthal (1985). The unit of observation is an individual-congress member.

Figure 3a: Party-Unity Score (c.d.f.)



Notes. Party-Unity Score defined as the percentage of votes to bills on which more than 70% of the opposite party voted yes, and less than 30% of his/her own party voted yes. The unit of observation is an individual-congress member.

Figure 3b: Party-Unity Score (c.d.f.) - Women's Issues



Notes. Party-Unity Score defined as the percentage of votes to bills on which more than 70% of the opposite party voted yes, and less than 30% of his/her own party voted yes. The unit of observation is an individual-congress member.

Figure 4: Fraction of Female Congress Members

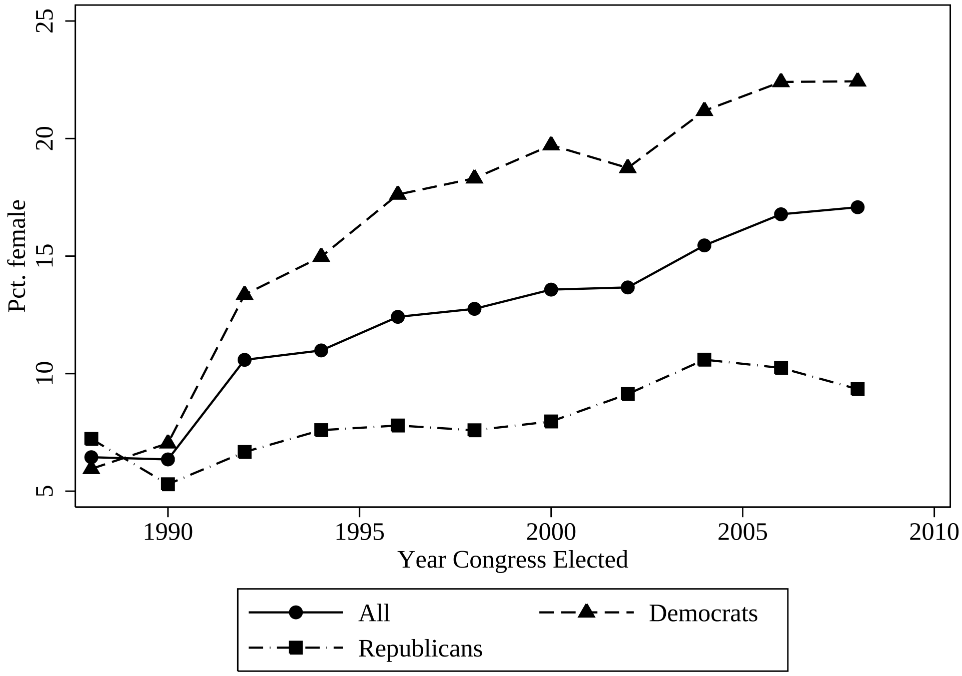


Figure 5a: Mean Number of Cosponsors

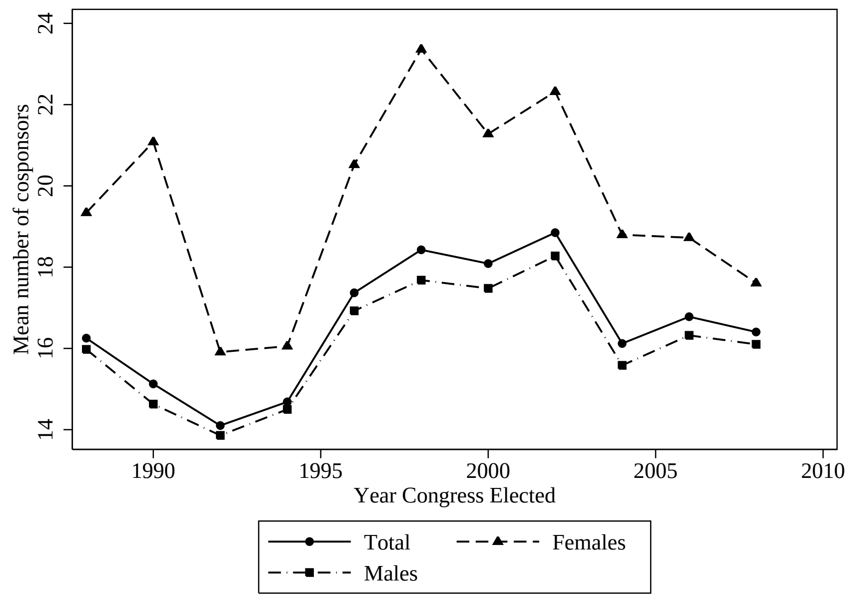


Figure 5b: Fraction Cosponsors of Opposite Party

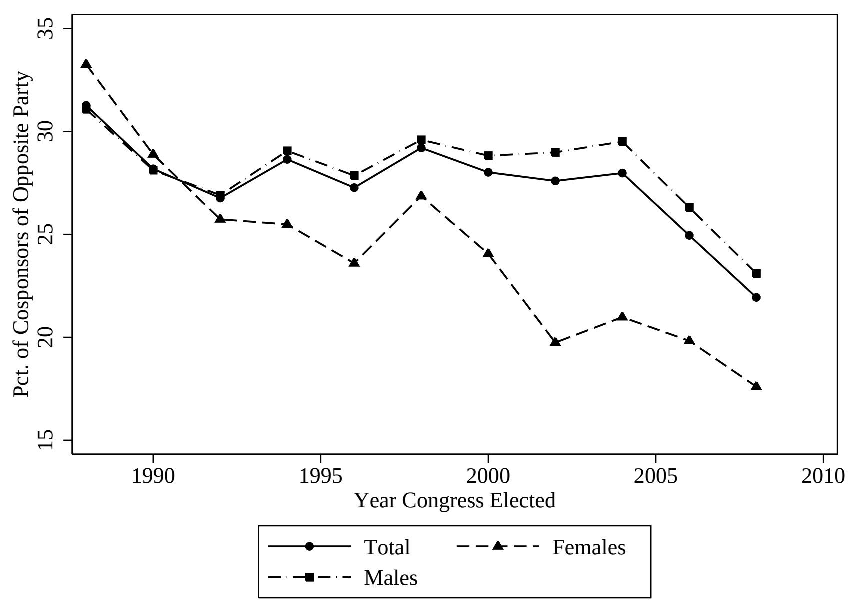
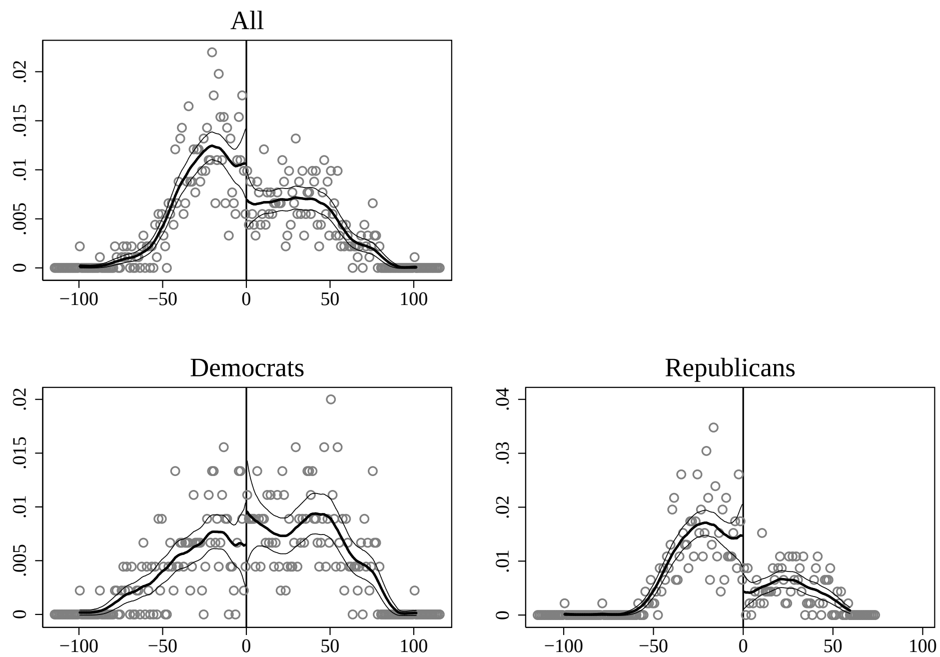


Figure 6: McCrary Density Test



Notes. Kernel density of the margin of victory of the female candidate for a bandwidth $h = 15$. The unit of observation is an individual-congress member.

A Appendix A: Comparative Statics Derivations

Taking the first derivative of n^* and x^* w.r.t. c_i, b_i and a_i, and under the assumption that $f_{12} < 0$, we obtain that:

$$\frac{\partial n}{\partial c} = -\frac{1}{|J|} \begin{vmatrix} -1 & -f_{12}(x-m) \\ 0 & 1 - \frac{f_{22}a(x-m)(b-m)}{(a+f_2)^2} \end{vmatrix} < 0 \tag{6}$$

$$\frac{\partial n}{\partial b} = -\frac{1}{|J|} \begin{vmatrix} 0 & -f_{12}(x-m) \\ -\frac{a}{a+f_2} & 1 - \frac{f_{22}a(x-m)(b-m)}{(a+f_2)^2} \end{vmatrix} < 0 \tag{7}$$

$$\frac{\partial n}{\partial a} = -\frac{1}{|J|} \begin{vmatrix} 0 & -f_{12}(x-m) \\ -\frac{-f_2(b-m)}{(a+f_2)^2} & 1 - \frac{f_{22}a(x-m)(b-m)}{(a+f_2)^2} \end{vmatrix} < 0 \tag{8}$$

Also

$$\frac{\partial x}{\partial b} = -\frac{1}{|J|} \begin{vmatrix} f_{11} & -1 \\ \frac{f_{12}a(b-m)}{(a+f_2)^2} & \frac{-a}{(a+f_2)} \end{vmatrix} > 0 \tag{9}$$

$$\frac{\partial x}{\partial a} = -\frac{1}{|J|} \begin{vmatrix} f_{11} & -1 \\ \frac{f_{12}a(b-m)}{(a+f_2)^2} & \frac{-f_2(b-m)}{(a+f_2)^2} \end{vmatrix} > 0 \tag{10}$$

$$\frac{\partial x}{\partial c} = -\frac{1}{|J|} \begin{vmatrix} f_{11} & -1 \\ \frac{f_{12}a(b-m)}{(a+f_2)^2} & 0 \end{vmatrix} > 0 \tag{11}$$

Table 1: Gender and Bill Passed the House

	(1)	(2)
Number of Cosponsors (÷100)	0.075 ***	0.070 ***
	(0.009)	(0.010)
Fraction Cosponsors Opposite	0.167 ***	0.172 ***
	(0.010)	(0.010)
Number of Cosponsors (÷100) * Fraction Cosponsors Opposite	-0.076 ***	-0.065 **
	(0.023)	(0.025)
Sponsor Female		-0.011
		(0.008)
Sponsor Female interacted with:		
Number of Cosponsors (÷100)		0.028
		(0.024)
Fraction Cosponsors Opposite		-0.042 *
		(0.025)
Number of Cosponsors (÷100) * Fraction Cosponsors Opposite		-0.054
		(0.059)
n. bills	60,677	60,677
n. sponsors	4,746	4,746
Year effects	Yes	Yes
Bill characteristics	Yes	Yes
Sponsor charactersistics	Yes	Yes
District characteristics	Yes	Yes

Notes: Robust standard errors, clustered at the individual-Congress level, in parentheses. The unit of observation is a bill. All estimates include Congress fixed effects. Bill characteristics include 33 dummies for the committee of referral, and 226 dummies for the topic. Sponsor characteristics include: age, tenure in Congress, a dummy for whether the sponsor is a rookie, a committee leader (chair or ranking member) or black, a party dummie, 5 occupational dummies, a dummy for whether the sponsor has an Ivy League college degree, a dummy for whether the sponsor was born in the state of election, and the total number of bills sponsored within the congress. District characteristics include: 3 macro area dummies, the percentage of black, over-65, foreign and urban residents, the logarithm of the median income, and the logarithm of population density.

Table 2: Summary Statistics

Panel A: Sponsor Characteristics

	All			Democrats			Republicans		
	All	Male	Female	All	Male	Female	All	Male	Female
Number of Sponsors	4,778	4,188	590	2,505	2,099	406	2,273	2,089	184
Number of bills sponsored: mean	12.8	12.5	14.5	13.2	12.9	14.8	12.4	12.2	14.0
	(10.5)	(10.4)	(11.1)	(11.1)	(10.9)	(12.0)	(9.7)	(9.8)	(8.8)

Panel B: Bill Characteristics

	All	Male	Female	All	Male	Female	All	Male	Female
Number of bills	61,161	52,577	8,584	33,043	27,027	6,016	28,118	25,550	2,568
Number of cosponsors: mean	17.0	16.5	19.9	17.6	17.0	19.9	16.3	15.9	19.8
	(35.9)	(35.5)	(38.3)	(35.8)	(35.6)	(36.8)	(36.0)	(35.4)	(41.7)
Number of cosponsors: median	3	3	5	4	3	6	3	3	4
Percent cosponsors opposite party: mean	15.0	15.2	13.5	11.7	12.4	9.0	18.8	18.3	23.9
	(21.3)	(21.4)	(20.6)	(18.1)	(18.6)	(15.32)	(24.0)	(23.6)	(26.8)

Notes: In Panel A the unit of observation is an individual-congress member, while in Panel B is a bill. Standard deviation in parentheses.

Table 3: OLS Regressions

	(1)		(2)		(3)		(4)		(5)	
A: Number of Cosponsors										
All	3.308	***	1.297	**	1.956	***	0.846		1.395	**
s.e.	(0.667)		(0.602)		(0.616)		(0.618)		(0.628)	
n. bills	61,334		61,334		60,670		61,334		60,670	
n. sponsors	4,791		4,791		4,746		4,791		4,746	
Democrats	2.675	***	0.668		1.994	***	0.057		1.172	
s.e.	(0.836)		(0.757)		(0.726)		(0.789)		(0.746)	
n. bills	33,043		33,043		32,847		33,043		32,847	
n. sponsors	2,505		2,505		2,492		2,505		2,492	
Republicans	4.082	***	2.811	***	3.491	***	2.419	**	3.149	***
s.e.	(1.135)		(0.963)		(1.042)		(0.948)		(1.017)	
n. bills	28,118		28,118		27,671		28,118		27,671	
n. sponsors	2,273		2,273		2,244		2,273		2,244	
B: Percent Cosponsors of Opposite Party										
All	-1.539	**	-2.000	***	-0.124		-0.896		0.181	
s.e.	(0.626)		(0.594)		(0.505)		(0.560)		(0.507)	
n. bills	61,331		61,331		60,667		61,331		60,667	
n. sponsors	4,791		4,791		4,746		4,791		4,746	
Democrats	-2.996	***	-2.560	***	-2.178	***	-1.648	***	-1.505	***
s.e.	(0.417)		(0.405)		(0.401)		(0.407)		(0.419)	
n. bills	33,042		33,042		32,846		33,042		32,846	
n. sponsors	2,505		2,505		2,492		2,505		2,492	
Republicans	5.847	***	3.765	***	4.766	***	2.954	***	3.666	***
s.e.	(1.177)		(0.967)		(0.947)		(0.881)		(0.916)	
n. bills	28,116		28,116		27,669		28,116		27,669	
n. sponsors	2,273		2,273		2,244		2,273		2,244	
Year effects	Yes		Yes		Yes		Yes		Yes	
Bill characteristics	No		Yes		Yes		Yes		Yes	
Sponsor charactersistics	No		No		Yes		No		Yes	
District characteristics	No		No		No		Yes		Yes	

Notes: Each entry in the table represents the coefficient on the female sponsor dummy from separate regressions. Robust standard errors, clustered at the individual-Congress level, in parentheses. The unit of observation is a bill. All estimates include Congress fixed effects. Bill characteristics include 33 dummies for the committee of referral, and 226 dummies for the topic. Sponsor characteristics include: age, tenure in Congress, a dummy for whether the sponsor is a rookie, a committee leader (chair or ranking member) or black, a party dummie, 5 occupational dummies, a dummy for whether the sponsor has an Ivy League college degree, a dummy for whether the sponsor was born in the state of election, and the total number of bills sponsored within the congress. District characteristics include: 3 macro area dummies, the percentage of black, over-65, foreign and urban residents, the logarithm of the median income, and the logarithm of the population density.

Table 4: Balancing Tests

	ALL			Democrats			Republicans		
	(1) OLS - Full Sample	(2) RD - optimal bandwidth	(3) PS matching - Full Sample	(4) OLS - Full Sample	(5) RD - optimal bandwidth	(6) PS matching - Full Sample	(7) OLS - Full Sample	(8) RD - optimal bandwidth	(9) PS matching - Full Sample
A: District Characteristics									
Northeast	-0.038	-0.003	0.035	-0.114	-0.354 *	-0.028	0.051	-0.036	-0.022
Midwest	-0.053	-0.218	-0.017	-0.022	0.242	0.003	-0.097	-0.655 *	0.061
South	-0.204	-0.152	-0.020	-0.304 *	-0.413 *	0.030	0.003	0.120	-0.033
West	0.293 *	0.445 *	0.005	0.418 *	0.525 *	-0.005	0.048	0.563 *	-0.004
% Black	0.094	-0.077	-0.030	0.057	-0.172	0.017	-0.200	-0.271 *	-0.120
% Urban	0.429 *	0.094	0.036	0.435 *	0.216	0.016	0.260 *	-0.240	0.027
% Foreign Born	0.421 *	0.050	-0.002	0.435 *	0.164	-0.026	0.241	-0.225	0.003
% Over 65	-0.179	-0.209	0.013	-0.308 *	-0.260 *	0.037	0.013	-0.276 *	-0.023
Log(Median Income)	0.121	0.093	0.024	0.207	0.363 *	0.014	0.070	-0.205	-0.001
Log(Population Density)	-0.048	0.025	-0.003	-0.066	0.345 *	0.058	-0.091	0.025	-0.075
Lagged Democratic Share	0.248	0.087	0.016	0.010	-0.228	-0.069	0.122	0.369 *	0.089
Campaign Expenditures Ratio (D/R)	0.227	0.054	0.053	0.018	0.044	-0.001	0.047	0.019	0.113
Margin of victory	-0.033	0.000	-0.059	-0.021	0.000	-0.054	-0.149	0.000	-0.040
B: Member Characteristics									
Democrat	0.276 *	0.617 *	0.042	-	-	-	-	-	-
Tenure in Congress	-0.304 *	-0.283 *	-0.307 *	-0.367 *	-0.541 *	-0.348 *	-0.265 *	0.156	-0.330 *
Rookie	0.110	0.181	0.089	0.155	0.400 *	0.133	0.053	-0.494 *	0.029
Age	0.139	0.128	0.099	0.124	-0.173	0.015	0.129	0.395 *	0.112
Leader	-0.204	-0.079	-0.261 *	-0.197	-0.208	-0.291 *	-0.222	-0.082	-0.234
Born in State	-0.363 *	-0.370 *	-0.330 *	-0.308 *	-0.263 *	-0.137	-0.497 *	-0.457 *	-0.550 *
Ivy League College	-0.124	-0.100	-0.157	-0.168	-0.195	-0.177	-0.094	0.063	-0.132
No occupation	0.147	-0.050	0.164	0.126	-0.069	0.157	0.107	0.380 *	0.104
Education	0.254 *	0.165	0.169	0.225	0.115	0.165	0.281 *	0.301 *	0.101
Lawyer	-0.436 *	-0.176	-0.430 *	-0.455 *	-0.191	-0.458 *	-0.518 *	-0.380 *	-0.502 *
Professional	-0.110	-0.065	-0.135	-0.048	-0.100	-0.042	-0.267 *	-0.251 *	-0.275 *
Business	-0.175	0.178	-0.213	-0.007	0.636 *	-0.097	-0.299 *	0.127	-0.313 *
Other	0.283 *	-0.079	0.380 *	0.170	-0.387 *	0.264 *	0.532 *	-0.252 *	0.676 *
Black	0.209	-0.009	0.059	0.189	-0.078	0.065	-0.058	0.000	-0.063

Notes: Each coefficient represents the standardized difference between treated and control units. All specifications control for Congress fixed effects. The unit of observation is an individual-congress member. *Leader* is a dummy for being a committee chair or ranking member. *Camp. Exp. D/R* is the percentage of total campaign spending by the Democratic candidate. In column (4) the optimal bandwidth is 25.

Table 5: RD and PS Matching Estimates

	(1) OLS - Full Sample		(2) RD - optimal bandwidth		(3) RD - optimal bandwidth with PS matching		(4) PS matching - Full Sample		(5) PS matching - Full Sample	
A: Number of Cosponsors										
All	1.395	**	2.308		1.138		0.496		-0.083	
s.e.	(0.628)		(2.597)		(2.333)		(0.608)		(0.673)	
n. bills	60,670		4,871		4,871		55,672		55,008	
n. sponsors	4,746		403		403		4,403		4,358	
optimal bandwidth			25		25					
Democrats	1.172		2.182		-1.600		0.429		0.301	
s.e.	(0.746)		(3.609)		(3.459)		(0.892)		(0.950)	
n. bills	32,847		2,343		2,343		29,560		29,364	
n. sponsors	2,492		193		193		2,278		2,265	
optimal bandwidth			30		30					
Republicans	3.149	***	6.101		6.857	*	1.912	**	3.124	***
s.e.	(1.017)		(4.796)		(3.912)		(0.852)		(1.040)	
n. bills	27,671		1,227		1,227		26,089		23,818	
n. sponsors	2,244		100		100		2,121		1,953	
optimal bandwidth			13		13					
B: Percent Cosponsors of Opposite Party										
All	0.181		0.822		1.884		0.982		0.651	
s.e.	(0.507)		(3.876)		(3.071)		(0.732)		(0.860)	
n. bills	60,667		2,781		2,781		55,670		55,006	
n. sponsors	4,746		232		232		4,403		4,358	
optimal bandwidth			16		16					
Democrats	-1.505	***	-3.351	*	-5.297	***	-0.929		-1.208	**
s.e.	(0.419)		(1.910)		(2.000)		(0.570)		(0.525)	
n. bills	32,846		1,978		1,978		29,559		29,363	
n. sponsors	2,492		167		167		2,278		2,265	
optimal bandwidth			24		24					
Republicans	3.666	***	12.514	*	5.038		2.905	***	2.827	***
s.e.	(0.916)		(6.673)		(3.850)		(0.820)		(0.868)	
n. bills	27,669		1,043		1,043		26,088		23,817	
n. sponsors	2,244		88		88		2,121		1,953	
optimal bandwidth			11		11					
Sponsor characteristics	Yes		No		No		No		No	
Bill charactertistics	Yes		No		Yes		Yes		Yes	
District characteristics	Yes		No		No		No		No	
Propensity Score					Distr.		Distr.+MV		Distr.+MV+Spon.	

Notes: Entries in the table represent the coefficient on the female sponsor dummy. Robust standard errors, clustered at the individual-Congress level, in parentheses. The unit of observation is a bill. All estimates include Congress fixed effects. Bill characteristics include 33 dummies for the committee of referral, and 226 dummies for the topic. Sponsor characteristics include: age, tenure in Congress, a dummy for whether the sponsor is a rookie, a committee leader (chair or ranking member) or black, a party dummie, 5 occupational dummies, a dummy for whether the sponsor has an Ivy League college degree, a dummy for whether the sponsor was born in the state of election, and the total number of bills sponsored within the congress. District characteristics include: 3 macro area dummies, the percentage of black, over-65, foreign and urban residents, the logarithm of the median income, and the logarithm of the population density.

Table 6a: Gender and the Types of Cosponsors Recruited

	(1) OLS - Full Sample	(2) RD - optimal bandwidth	(3) RD - optimal bandwidth with PS matching	(4) PS matching - Full Sample	(5) PS matching - Full Sample
A: Percent Female Cosponsors					
Democrats	2.523 ***	2.186	1.135	1.937 ***	2.449 ***
s.e.	(0.387)	(1.615)	(1.581)	(0.344)	(0.396)
n. bills	32,845	1,795	1,795	29,559	29,363
n. sponsors	2,492	152	152	2,278	2,265
optimal bandwidth		22	22		
Republicans	1.154 ***	2.355	-0.137	1.376 ***	1.509 ***
s.e.	(0.389)	(2.576)	(2.106)	(0.380)	(0.407)
n. bills	27,670	1,157	1,157	26,088	23,817
n. sponsors	2,244	95	95	2,121	1,953
optimal bandwidth		12	12		
B: Percent Leader Cosponsors					
Democrats	-0.218	-2.238 *	-1.248	-0.576 **	-0.241
s.e.	(0.245)	(1.217)	(1.300)	(0.239)	(0.253)
n. bills	32,846	1,980	1,980	29,559	29,363
n. sponsors	2,492	168	168	2,278	2,265
optimal bandwidth		25	25		
Republicans	0.439	1.285	4.010 **	0.039	-0.081
s.e.	(0.270)	(1.739)	(1.909)	(0.236)	(0.272)
n. bills	27,670	989	989	26,088	23,817
n. sponsors	2,244	83	83	2,121	1,953
optimal bandwidth		11	11		
C: Percent Cosponsors Tenured 5+					
Democrats	0.548	-3.452	-3.565	-0.439	0.321
s.e.	(0.755)	(3.672)	(3.711)	(0.794)	(0.953)
n. bills	32,845	1,562	1,562	29,559	29,363
n. sponsors	2,492	129	129	2,278	2,265
optimal bandwidth		19	19		
Republicans	1.045	2.239	2.620	0.197	1.422
s.e.	(0.806)	(4.821)	(3.267)	(0.750)	(0.879)
n. bills	27,666	1,123	1,123	26,085	23,814
n. sponsors	2,244	93	93	2,121	1,953
optimal bandwidth		11	11		
Sponsor characteristics	Yes	No	No	No	No
Bill charactertistics	Yes	No	Yes	Yes	Yes
District characteristics	Yes	No	No	No	No
Propensity Score			Distr.	Distr.+MV	Distr.+MV+Spon.

Notes: Entries in the table represent the coefficient on the female sponsor dummy. Robust standard errors, clustered at the individual-Congress level, in parentheses. The unit of observation is a bill. All estimates include Congress fixed effects. Bill characteristics include 33 dummies for the committee of referral, and 226 dummies for the topic. Sponsor characteristics include: age, tenure in Congress, a dummy for whether the sponsor is a rookie, a committee leader (chair or ranking member) or black, a party dummie, 5 occupational dummies, a dummy for whether the sponsor has an Ivy League college degree, a dummy for whether the sponsor was born in the state of election, and the total number of bills sponsored within the congress. District characteristics include: 3 macro area dummies, the percentage of black, over-65, foreign and urban residents, the logarithm of the median income, and the logarithm of the population density.

Table 6b: Gender and the Types of Cosponsors Recruited

	(1) OLS - Full Sample		(2) RD - optimal bandwidth	(3) RD - optimal bandwidth with PS matching	(4) PS matching - Full Sample		(5) PS matching - Full Sample	
D: Mean Betweeness Centrality Cosponsors								
Democrats	-0.141	***	-0.118	0.035	-0.080		-0.114	**
s.e.	(0.034)		(0.223)	(0.243)	(0.064)		(0.057)	
n. bills	32,847		1,283	1,283	29,560		29,364	
n. sponsors	2,492		110	110	2,278		2,265	
optimal bandwidth			16	16				
Republicans	0.097		-0.108	0.253	0.090		0.112	
s.e.	(0.077)		(0.373)	(0.474)	(0.068)		(0.083)	
n. bills	27,671		469	285	26,089		23,818	
n. sponsors	2,244		41	22	2,121		1,953	
optimal bandwidth			5	5				
E: Variance DWNom1 Cosponsors								
Democrats	-9.201	***	5.008	-13.556	-8.120	***	-4.624	
s.e.	(2.627)		(10.282)	(12.314)	(2.665)		(3.170)	
n. bills	32,724		1,899	1,899	29,442		29,248	
n. sponsors	2,485		160	160	2,271		2,258	
optimal bandwidth			23	23				
Republicans	2.067		7.941	-14.966	-3.060		2.676	
s.e.	(3.655)		(17.681)	(14.019)	(3.083)		(4.510)	
n. bills	27,577		1,515	1,515	26,009		23,748	
n. sponsors	2,235		123	123	2,113		1,945	
optimal bandwidth			16	16				
Sponsor characteristics	Yes		No	No	No		No	
Bill charactertistics	Yes		No	Yes	Yes		Yes	
District characteristics	Yes		No	No	No		No	
Propensity Score				Distr.	Distr.+MV		Distr.+MV+Spon.	

Notes: Entries in the table represent the coefficient on the female sponsor dummy. Robust standard errors, clustered at the individual-Congress level, in parentheses. All measures include the sponsor and are mutiplied by 1,000. The unit of observation is a bill. All estimates include Congress fixed effects. Bill characteristics include 33 dummies for the committee of referral, and 226 dummies for the topic. Sponsor characteristics include: age, tenure in Congress, a dummy for whether the sponsor is a rookie, a committee leader (chair or ranking member) or black, a party dummie, 5 occupational dummies, a dummy for whether the sponsor has an Ivy League college degree, a dummy for whether the sponsor was born in the state of election, and the total number of bills sponsored within the congress. District characteristics include: 3 macro area dummies, the percentage of black, over-65, foreign and urban residents, the logarithm of the median income, and the logarithm of the population density.

Table 7: Gender and the Number of Cosponsors, by Sponsor Tenure

	(1) OLS - Full Sample	(2) RD - optimal bandwidth	(3) RD - optimal bandwidth with PS matching	(4) PS matching - Full Sample	(5) PS matching - Full Sample
A: Tenure 5+					
Democrats	1.325	-7.577	-25.639 ***	-0.201	-0.625
s.e.	(1.041)	(7.162)	(7.927)	(1.248)	(1.188)
n. bills	21,497	805	805	18,908	18,846
n. sponsors	1,376	52	52	1,238	1,232
optimal bandwidth		30	30		
Republicans	4.176 **	-4.080	-2.965	4.071 ***	5.951 ***
s.e.	(1.700)	(5.517)	(14.892)	(1.242)	(1.668)
n. bills	15,785	410	410	14,848	13,537
n. sponsors	1,080	26	26	1,010	939
optimal bandwidth		13	13		
B: A: Tenure 5-					
Democrats	0.505	2.464	-0.306	1.835	2.804 **
s.e.	(0.981)	(4.641)	(4.527)	(1.183)	(1.371)
n. bills	11,350	1,538	1,538	10,652	10,518
n. sponsors	1,116	141	141	1,040	1,033
optimal bandwidth		30	30		
Republicans	0.580	3.370	7.046	0.857	1.088
s.e.	(1.177)	(5.320)	(4.412)	(1.020)	(1.190)
n. bills	11,886	817	817	11,241	10,281
n. sponsors	1,164	74	74	1,111	1,014
optimal bandwidth		13	13		
Sponsor characteristics	Yes	No	No	No	No
Bill charactertistics	Yes	No	Yes	Yes	Yes
District characteristics	Yes	No	No	No	No
Propensity Score			Distr.	Distr.+MV	Distr.+MV+Spon.

Notes: Entries in the table represent the coefficient on the female sponsor dummy. Robust standard errors, clustered at the individual-Congress level, in parentheses. The unit of observation is a bill. All estimates include Congress fixed effects. Bill characteristics include 33 dummies for the committee of referral, and 226 dummies for the topic. Sponsor characteristics include: age, tenure in Congress, a dummy for whether the sponsor is a rookie, a committee leader (chair or ranking member) or black, a party dummie, 5 occupational dummies, a dummy for whether the sponsor has an Ivy League college degree, a dummy for whether the sponsor was born in the state of election, and the total number of bills sponsored within the congress. District characteristics include: 3 macro area dummies, the percentage of black, over-65, foreign and urban residents, the logarithm of the median income, and the logarithm of the population density.

Table 8: Gender and the Number of Cosponsors, by Bill Content

	(1) OLS - Full Sample	(2) RD - optimal bandwidth	(3) RD - optimal bandwidth with PS matching	(4) PS matching - Full Sample	(5) PS matching - Full Sample
A: Women's Issues					
Democrats	2.506 **	-0.705	-2.802	-1.382	0.638
s.e.	(1.104)	(8.821)	(7.456)	(1.133)	(1.264)
n. bills	11,721	613	613	10,316	10,277
n. sponsors	868	56	56	775	773
optimal bandwidth		21	21		
Republicans	4.045 **	14.172	11.419	1.639	3.143 *
s.e.	(1.866)	(9.161)	(7.938)	(1.632)	(1.874)
n. bills	8,292	508	508	7,811	6,980
n. sponsors	682	50	50	652	599
optimal bandwidth		16	16		
B: Other Issues					
Democrats	0.516	-3.410	-0.437	1.730	0.331
s.e.	(0.854)	(3.962)	(4.140)	(1.152)	(1.214)
n. bills	21,126	1,083	1,083	19,244	19,087
n. sponsors	1,624	86	86	1,503	1,492
optimal bandwidth		21	21		
Republicans	2.552 **	-2.525	-0.789	2.094 **	3.253 ***
s.e.	(1.079)	(3.819)	(3.873)	(0.998)	(1.225)
n. bills	19,379	1,205	1,205	18,278	16,838
n. sponsors	1,562	85	85	1,469	1,354
optimal bandwidth		16	16		
Sponsor characteristics	Yes	No	No	No	No
Bill charactertistics	Yes	No	Yes	Yes	Yes
District characteristics	Yes	No	No	No	No
Propensity Score			Distr.	Distr.+MV	Distr.+MV+Spon.

Notes: Entries in the table represent the coefficient on the female sponsor dummy. Robust standard errors, clustered at the individual-Congress level, in parentheses. The unit of observation is a bill. All estimates include Congress fixed effects. Bill characteristics include 33 dummies for the committee of referral, and 226 dummies for the topic. Sponsor characteristics include: age, tenure in Congress, a dummy for whether the sponsor is a rookie, a committee leader (chair or ranking member) or black, a party dummie, 5 occupational dummies, a dummy for whether the sponsor has an Ivy League college degree, a dummy for whether the sponsor was born in the state of election, and the total number of bills sponsored within the congress. District characteristics include: 3 macro area dummies, the percentage of black, over-65, foreign and urban residents, the logarithm of the median income, and the logarithm of the population density.

Table 9: Gender and Percent Cosponsors of the Opposite Party, by Sponsor Tenure

	(1) OLS - Full Sample	(2) RD - optimal bandwidth	(3) RD - optimal bandwidth with PS matching	(4) PS matching - Full Sample	(5) PS matching - Full Sample
A: Tenure 5+					
Democrats	-1.645 ***	0.648	-9.149	-1.693 **	-1.675 **
s.e.	(0.581)	(5.287)	(6.168)	(0.675)	(0.653)
n. bills	21,496	557	557	18,907	18,845
n. sponsors	1,376	37	37	1,238	1,232
optimal bandwidth		24	24		
Republicans	6.638 ***	14.384 ***	15.101	7.090 ***	7.990 ***
s.e.	(1.394)	(4.643)	(15.600)	(1.092)	(1.081)
n. bills	15,784	318	318	14,847	13,536
n. sponsors	1,080	20	20	1,010	939
optimal bandwidth		11	11		
B: A: Tenure 5-					
Democrats	-1.180 *	-3.707	-3.251	-0.423	-0.207
s.e.	(0.607)	(2.488)	(2.387)	(0.670)	(0.715)
n. bills	11,350	1,421	1,421	10,652	10,518
n. sponsors	1,116	130	130	1,040	1,033
optimal bandwidth		24	24		
Republicans	0.292	-2.655	-1.135	1.165	-0.724
s.e.	(1.032)	(3.630)	(3.429)	(0.842)	(0.925)
n. bills	11,885	725	725	11,241	10,281
n. sponsors	1,164	68	68	1,111	1,014
optimal bandwidth		11	11		
Sponsor characteristics	Yes	No	No	No	No
Bill charactertistics	Yes	No	Yes	Yes	Yes
District characteristics	Yes	No	No	No	No
Propensity Score			Distr.	Distr.+MV	Distr.+MV+Spon.

Notes: Entries in the table represent the coefficient on the female sponsor dummy. Robust standard errors, clustered at the individual-Congress level, in parentheses. The unit of observation is a bill. All estimates include Congress fixed effects. Bill characteristics include 33 dummies for the committee of referral, and 226 dummies for the topic. Sponsor characteristics include: age, tenure in Congress, a dummy for whether the sponsor is a rookie, a committee leader (chair or ranking member) or black, a party dummie, 5 occupational dummies, a dummy for whether the sponsor has an Ivy League college degree, a dummy for whether the sponsor was born in the state of election, and the total number of bills sponsored within the congress. District characteristics include: 3 macro area dummies, the percentage of black, over-65, foreign and urban residents, the logarithm of the median income, and the logarithm of the population density.

Table 10: Gender and Percent Cosponsors of the Opposite Party, by Bill Content

	(1) OLS - Full Sample	(2) RD - optimal bandwidth	(3) RD - optimal bandwidth with PS matching	(4) PS matching - Full Sample	(5) PS matching - Full Sample
A: Women's Issues					
Democrats	-0.894 *	-2.014	-3.162	-0.444	-0.810
s.e.	(0.498)	(2.623)	(2.781)	(0.653)	(0.581)
n. bills	11,721	710	710	10,316	10,277
n. sponsors	854	71	71	751	747
optimal bandwidth		25	25		
Republicans	6.835 ***	24.394 **	11.176	6.398 ***	6.240 ***
s.e.	(1.486)	(10.462)	(7.820)	(1.078)	(1.320)
n. bills	8,290	383	383	7,810	6,979
n. sponsors	663	30	30	627	566
optimal bandwidth		12	12		
B: Other Issues					
Democrats	-2.040 ***	-4.806 **	-6.387 ***	-1.255 *	-1.523 **
s.e.	(0.525)	(2.362)	(2.422)	(0.659)	(0.638)
n. bills	21,125	1,270	1,270	19,243	19,086
n. sponsors	1,638	97	97	1,527	1,518
optimal bandwidth		25	25		
Republicans	1.728 *	2.051	0.313	0.964	1.267
s.e.	(0.909)	(4.935)	(3.943)	(0.919)	(0.921)
n. bills	19,379	829	829	18,278	16,838
n. sponsors	1,581	68	68	1,494	1,387
optimal bandwidth		12	12		
Sponsor characteristics	Yes	No	No	No	No
Bill charactertistics	Yes	No	Yes	Yes	Yes
District characteristics	Yes	No	No	No	No
Propensity Score			Distr.	Distr.+MV	Distr.+MV+Spon.

Notes: Entries in the table represent the coefficient on the female sponsor dummy. Robust standard errors, clustered at the individual-Congress level, in parentheses. The unit of observation is a bill. All estimates include Congress fixed effects. Bill characteristics include 33 dummies for the committee of referral, and 226 dummies for the topic. Sponsor characteristics include: age, tenure in Congress, a dummy for whether the sponsor is a rookie, a committee leader (chair or ranking member) or black, a party dummie, 5 occupational dummies, a dummy for whether the sponsor has an Ivy League college degree, a dummy for whether the sponsor was born in the state of election, and the total number of bills sponsored within the congress. District characteristics include: 3 macro area dummies, the percentage of black, over-65, foreign and urban residents, the logarithm of the median income, and the logarithm of the population density.