The Effect of Female Leadership on Contracting from Capitol Hill to Main Street[*]

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Abstract

This paper provides novel evidence that female politicians affect the distribution of government spending to women-owned firms. Exploiting close elections to address endogeneity, we show that female House representatives increase the proportion of US government procurement contracts allocated to women-owned firms in their respective districts by 6 percentage points. Consistent with inaccurate statistical discrimination, the effect persists after her departure, is strongest in districts with no prior female representation, and is not associated with declines in contract performance. Analyzing congressional requests from legislators to federal agencies, we argue that female politicians use individual oversight to influence contract allocation.

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1 Introduction

This paper studies the impact of female politicians on government spending, in particular its distribution between women-owned businesses (WOBs) and other firms. Similar to other areas in business, women-owned firms face more barriers in government contracting than their male counterparts and are underrepresented relative to their share in the economy.[1,2] Given prior evidence on female politicians taking legislative actions targeted at and beneficial for female constituents, we hypothesize that they have a clear incentive to increase the proportion of funds allocated to WOBs.

We estimate that the election of a female politician causes an increase in probability that a government contract is allocated to a WOB by around 6 percentage points. To put this magnitude in perspective, in 2018, unconditionally 20.4% of all contracts in our sample are awarded to WOBs, a 6.4 percentage point increase since the start of the sample in 2002. In other words, the effect attributable to the presence of a female representative amounts to 30% of the unconditional probability and is roughly similar to the change over the last 16 years. Our findings highlight female representation as an alternative pathway to decreasing gender gaps.

In our empirical approach, we focus on female members in the House of Representatives and the allocation of federal procurement contracts to small businesses in their respective district for the following reasons. First, 94% of women-owned firms are small businesses and small businesses account for a large portion of the U.S. economy.[3] Second, in contrast to collective political efforts such as legislative changes, federal procurement contracting can be linked to an individual district representative and an individual recipient. Finally, it is ex-ante not obvious that female leaders would engage in behavior that is very visible and favors a single group, women in business. Such behavior can be viewed as favoritism and hence might negatively affect a representative's future political career.[4]

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[1]The odds that a contract is allocated to a WOB is about 21% lower than otherwise similar companies (Beede and Rubinovitz, 2015; Bates, 2002). Roughly 50% of the population is female while only approximately 35% of all small businesses are owned by women. The share of government contracts allocated to WOBs is even smaller, only around 20%.

[2]For evidence on gender bias in business and access to capital, see Coleman and Robb (2009); Bellucci et al. (2010); Wu and Chua (2012); Alesina et al. (2013); Guzman and Kacperczyk (2019); Hebert (2020); Ewens and Townsend (2020).

[3]In 2018, there were more than 30 million small businesses in the U.S. which employed 47% of the private workforce and added 1.8 million net jobs. According to `https://advocacy.sba.gov/2019/04/24/small-businesses-drive-job-growth-in-united-states-they-account-for-1-8-million-net-new-jobs-latest-data-show/`

[4]Legislators' visibility and vulnerability may reduce their ability and willingness to represent minorities. For example, Atkinson and Windett (2019) conclude that congresswomen balance their legislative portfolios to overcome gender stereotypes.

We address the main endogeneity concern that female representation is not randomly assigned by exploiting close mixed-gender elections. Due to the ex-ante uncertainty regarding the outcomes, close elections provide quasi-random variation in election winners, implying that the gender of the winning candidate is as if exogenously assigned.[5] We identify 56 mixed-gender close elections between the 109th and 115th Congresses and merge them with detailed information on individual government procurement contracts obtained from the Federal Procurement Data System-Next Generation (FPDS-NG). Our final sample consists of 22,295 unique contracts awarded in the respective congressional district before and after the individual elections.

Our main difference-in-difference model finds that the election of a female representative substantially increases the probability that a government contract is awarded to a women-owned firm. Depending on specification, we estimate an effect of 5.0 to 6.2 percentage points. The effect is highly statistically significant at the 1% level and stable in magnitude across specifications. In our most conservative model, we include fixed effects for different product and service types, the subagencies awarding the contract, as well as 3-digit NAICS industry codes.

To corroborate the claim that the effect is caused by the gender of the elected official, we provide several tests to disperse validity concerns. Supporting internal consistency, we show that the probability of a female candidate winning an election is smoothly distributed and does not exhibit jumps. Congressional districts won by female candidates are similar to the districts won by male candidates in observable characteristics capturing female involvement in politics and business before the event. Lastly, we show the presence of parallel trends before the election and robustness to varying definitions of close elections.

Next, we investigate the consequences of female representatives affecting government contract allocation to women-owned firms. The behavior of female legislators is consistent with them mitigating frictions but also with them distorting resource allocation. Regarding the former, one might argue that removing barriers faced by women in business will yield economic growth. To quote Senator Jeanne Shaheen, Democrat from New Hampshire, "Women are at the center of the American economy"[6] and "Women entrepreneurs may be the country's greatest untapped economic resource".[7] However, there is also ample evidence on distortion of government con-

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[5]Close elections as an identification strategy were first used by Lee (2001) and have since been used by, among others, Lee et al. (2004); Lee (2008); Do et al. (2012); Akey (2015); Do et al. (2015); Akey and Lewellen (2017) and Adams and Mosk (2019). See Hasan et al. (2020) for an application of exploiting closed elections for as-if-random assignment of the legislator's gender.

[6]https://www.shaheen.senate.gov/news/press/shaheen-releases-report-on-womens-entrep reneurship

[7]https://www.forbes.com/sites/realspin/2018/01/11/sen-jeanne-shaheen-how-we-can-hel p-women-entrepreneurs-succeed/

tract allocation due to private benefits received by politicians (Goldman et al., 2013; Tahoun, 2014; Schoenherr, 2019; Brogaard et al., 2020).

To assess the consequences of government contract reallocation, we proceed by investigating the explanation of the gender gap before a female legislator enters office from a discrimination angle. A benefit of our setup is that we can track the evolution of contract allocation as well as the individual contract performance across gender over time. This is crucial, as different sources of discrimination generate the same pattern of observable behavior at a snapshot in time, and hence cannot be distinguished from each other (Fang and Moro, 2011). For example, the static observation that WOBs receive fewer government contracts than their male counterparts is consistent with accurate statistical discrimination (Phelps, 1972; Arrow, 1998), inaccurate statistical discrimination (Bordalo et al., 2016; Bohren et al., 2020), and taste-based discrimination (Becker, 1957). However, the dynamics of discrimination allow for identification of its underlying source, as shown theoretically by Bohren et al. (2019).

Consider inaccurate statistical discrimination as an explanation; the existing bias against women-owned firms is rooted in the belief that they are worse contractors. The increase in WOBs among government contractors due to a female representative leads to more accurate beliefs and hence the gender gap should decrease permanently. This explanation has at least three testable predictions about the dynamics of the gender gap which are not fully consistent with alternative sources of discrimination.

Inaccurate statistical discrimination assumes that agents are willing to update beliefs permanently. First, this implies that the increase in contracts allocated to WOBs should persist even after the initial term of the female representative. We provide consistent empirical evidence focusing on contracts awarded up to four years after the election. Whether she stays in office or is replaced by a male or female legislator does not affect the persistence. Second, the effect associated with the election of a female legislator should be stronger in areas with lower historical female representation as agents have not yet updated their biased beliefs in those areas. Focusing on the role of governors, senators, and House representatives, we show that districts with no prior female representation experience a stronger effect. Lastly, to update the beliefs about the performance of WOBs, the performance by WOBs in districts with female representatives should not deteriorate. We show that on several measures of contract performance, WOBs in districts won by female representatives perform similarly or weakly better than WOBs in districts won by their male counterparts.

In the next part of the paper, we investigate how female legislators affect the allocation of government contracts by federal agencies. Previous research highlights the role of oversight

by congressional committees and its link to government spending (Bertelli and Grose, 2009; Boland and Godsell, 2021). One could hypothesize that powerful committee positions enhance the impact a legislator might have on contract allocation. In this paper, we focus on close elections for causal inference, which has the drawback that the legislators in our sample are not likely to be senior and hence may never attain a powerful committee position.

Recent works by Judge-Lord et al. (2018) and Lowande et al. (2019) show that individual congress members also engage in oversight through daily requests to executive agencies, in particular to provide individual constituent service. To quote Dean Zerbe, former Counsel and Investigator for the Office of Senator Charles Grassley, on the trade-off between oversight via committees versus congressional requests: "[...] do not think that hearings are the be-all end-all of your oversight [...] We find it not to be a very helpful tool for oversight. We think our letters, getting material, getting that out to the public, having a public discussion about what they're doing, and getting detailed answers is often a much more successful way to get things accomplished."

We hypothesize that female legislators directly contact federal agencies to help WOBs in the allocation of government contracts. Many House representatives provide designated links regarding direct help in contacting federal agencies on their web pages.[8] In Section 7 we also provide an anecdotal example of Diana DeGette, a Democrat from Colorado, approaching the General Service Administration (GSA) on behalf of a WOB. Using Freedom of Information Act (FOIA) requests, we gather data on communication between legislators and the Department of Defense (DoD) and several of its subagencies.[9] Empirically, we show that the increase in contracts allocated to WOBs is bigger for female legislators who actively engage in individual oversight through communication with the DoD, in particular if related to contracting.

Before we conclude, we discuss several alternative but rejected explanations, starting with the role model hypothesis. Possibly, female representatives do not engage in any specific behavior, and it is their mere presence that changes the behavior of and attitude toward WOBs and women in general. For example, Chizema et al. (2015) and Kedia and Pareek (2020) show the female political representation affect board composition because of the role model effect. In our setup, the presence of female leaders might improve the attitude toward women in general, but also toward women in business, and hence they receive more contracts. Or her presence might inspire women to create businesses that later also become government contractors. We find no evidence of such patterns.

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[8]For example, see `https://murphy.house.gov/forms/casework/`.

[9]We focus on the DoD because it accounts for the largest share of government contracts and provided high quality data in response to our FOIA requests.

Another potential explanation that has been documented in a similar setup is networks. Schoenherr (2019) finds that Lee Myung Bak, the Korean president elected in 2007, affected the allocation of government contracts to private firms by appointing CEOs from his own networks to lead state-owned enterprises. These state-owned enterprises then were responsible for the allocation of procurement contracts to firms from the network of the president. Please note that this argument is not consistent with our empirical findings regarding persistence and historical female presence as a moderator. In addition, due to the focus on small businesses, our sample consists of thousands of unique firms, this mechanism is unlikely. Empirically, we construct several proxies for a local network of a legislator, such as whether the legislator was born in the district, whether she had local political experience, or whether she was a business owner before starting a political career. We find no evidence for the network effect.

Finally, we reject changing the composition of products and services acquired or changing the awarding agencies as a channel to increase the share of contracts allocated to WOBs. Contracting terms are also not affected by the gender of a legislator. Female legislators also do not affect contract allocation by establishing Small Business Development Centers (SBDC) in their districts that help local contractors in overcoming general administrative obstacles.

Our analysis relates to two strands of the literature: the literature investigating consequences of increased female representation in politics and the literature on the role of gender pairings in a business environment. We end this section by discussing the policy relevance of our results for approaching gender gaps in government contracting.

First, the paper adds to the literature examining the consequences of the increased participation by women in politics. Taken together, contributions in the field support the view that female politicians take actions and support legislative policies that are targeted at and beneficial for female constituents (Gerrity et al., 2007; Volden et al., 2018). Besides legislative actions, female legislators contact federal agencies more frequently on behalf of women constituents than their male colleagues (Lowande et al., 2019). Several recent papers focus on real outcomes of female role models for female constituents, such as labor market outcomes (West and Duell, 2020) and board composition (Chizema et al., 2015; Kedia and Pareek, 2020). From a more general perspective, female representatives also approach legislative activities that are unrelated to women's issues differently than their male counterparts.[10] While the existing literature, with few exceptions, focuses mainly on the relationship between the gender of representatives and legislation activity, we contribute by asking a fundamentally different question by looking at how women in politics directly affect economic outcomes for women in business. A notable

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[10]There has been extensive work done to study women as members of Congress and their impact on legislation (Swers, 2001, 2005; Pearson and Dancey, 2011).

exception is Ghani et al. (2014), who investigate political reservations for women in India with the role of women in manufacturing sector. However, the authors do not find any evidence of an increasing supply of government-sponsored contracts.

Second, we add to the literature on the role of gender pairings in a business environment, such as female entrepreneurs and female financiers, or women in leadership positions and female work-forces. Taken together, evidence in the field suggests that female interactions benefit women in a variety of contexts. For example, high-level female officers in the firm improve the working climate for other women at the firm, such as higher income (Bell, 2005; Matsa and Miller, 2011; Cohen et al., 2021), faster career paths (Matsa and Miller, 2011; Kunze and Miller, 2017), and a more female-friendly working culture (Amore et al., 2014; Tate and Yang, 2015). Regarding access to capital, the evidence is mixed, with some papers presenting evidence that female agents prefer to provide funding to female-led firms and women, while others find no evidence for bias. The literature has been studying crowdfunding (Vismara et al., 2016; Bapna and Ganco, 2020; Gafni et al., 2021), angel investors (Becker-Blease and Sohl, 2007; Ewens and Townsend, 2020), venture capital (Hebert, 2020; Gornall and Strebulaev, 2020), and personal debt financing (Bellucci et al., 2010).[11] We contribute to this literature because, to the best of our knowledge, we are the first to report a direct effect of gender pairings across the realm of politics and business, focusing on the government's demand for products and services provided by women-owned firms. From an entrepreneurial perspective, this is important because, according to Shelton and Minniti (2018), limited product market access is a key barrier to the survival and growth of entrepreneurs.

Our findings are also of interest to policy makers, as the gender gap in government contracts has been prominent in public debates. Already, Bates (2002) points out that WOBs receive fewer government contracts than their male counterparts.[12] According to a report published by the Commerce Department, the odds of women-owned firms winning a federal contract are about 21% lower than for otherwise similar companies (Beede and Rubinovitz, 2015). In 1994, Congress enacted the Federal Acquisition Streamlining Act (FASA), signed into law by President Clinton, which set a goal of awarding 5% of federal government contract dollars annually to women-owned small businesses (WOSBs). Since then, Congress has initiated several explicit programs aiming to increase female participation in government contracting.[13] Nevertheless, it

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[11]For additional evidence on gender bias in business and access to capital, see Coleman and Robb (2009); Asiedu et al. (2012); Wu and Chua (2012); Alesina et al. (2013); Lee and Huang (2018); Guzman and Kacperczyk (2019); Raina (2019); Delis et al. (2020); Snellman and Solal (2020).

[12]For more evidence on the allocation of government procurement contracts, see, among others, Cohen and Malloy (2016); Canayaz et al. (2019); Esqueda et al. (2019); Ferris et al. (2019); Heese and Perez-Cavazos (2019); Podolski and Veeraraghavan (2019); Agca et al. (2020); Ayyagari et al. (2020); Cox et al. (2020); Canayaz et al. (2021); Denes et al. (2021); Tian and Xia (2021).

[13]The most notable is the Women in Small Business program, which was implemented in 2011. Our sample

took 21 years until the goal was first reached in 2015. Our findings highlight an alternative pathway through which female politicians decrease gender gaps in government contracting. This is particularly timely given that, at the time of writing this paper, the number of female representatives in the House of Representatives is at an all-time high of 120 for the 117th Congress and that the first female vice president was inaugurated in 2021.

To sum up, we shed new light on the role of female representatives in the contracting relationship between private businesses and the U.S. government. As opposed to being merely the actors that set the legislative policies shaping the business environment, female legislators actively reduce the gender gap within the U.S. procurement system.

The rest of the paper is organized as follows. Section 2 describes the institutional details of the government procurement contract system and evidence on political influence on contract allocation. Next, in Section 3, we introduce our empirical framework, followed by discussion of the used data sources in Section 4. Section 5 presents our main results. Section 6 explores the consequences, while Section 7 discusses oversight as mechanism. In Section 8, we discuss alternative but rejected hypotheses. We draw conclusions in Section 9.

2 Institutional Details

The first part of this section discusses the process of contracting between the U.S. government and private firms, focusing on small business set-asides and the identification of WOBs. In the second subsection, we describe the process of congressional oversight.

2.1 Contracting between the U.S. Government and Private Firms

Federal procurement contracts are agreements between government agencies and businesses to obtain goods and services for a negotiated price and duration. The process of awarding government contracts starts with a federal agency identifying a need for a purchase of a good or service. The agency decides the degree and method by which the contract is competed, the form of pricing appropriate to the contract, and whether the contract is for a definitive quantity or some indefinite delivery vehicle. Then, a contracting officer of this agency posts a solicitation on the beta.SAM.gov website. A solicitation announcement identifies what the agency wants to buy, provides instructions to potential contractors, identifies the source selection method to evaluate offers, and includes a deadline for the submission of bids or proposals. Firms then submit their

does not include contracts issued under this program and hence our findings are not driven by the increased use of it.

offers for review by agency officers who evaluate them and make the final decision.[14]

Firms interested in getting a federal contract must obtain a Dun & Bradstreet Data Universal Numbering System (DUNS) unique number for each of the business's physical locations, and register with the federal government's System for Award Management (SAM). Firms that identify themselves as a small business in SAM must (1) meet the Small Business Act's definition of a small business and (2) not exceed size standards established, and updated periodically, by the Small Business Administration (SBA).[15]

Until summer 2020, small businesses could self-certify as WOSB when they register at SAM. The Small Business Act defines a WOSB as one that is a small business; is at least 51% owned and controlled by women who are U.S. citizens; and has women manage day-to-day operations and also make long-term decisions. There is no additional monetary or time cost for firms to choose the WOSB flag in the system. In addition, self-misclassification is punished.[16]

In this paper, we focus on SBA set-aside contracts with specified terms and conditions, so-called definitive contracts (DCs), for two main reasons. First, 94% of women-owned firms are small businesses according to the Commerce Department (Beede and Rubinovitz, 2015). Second, DCs allow us to assess how female representatives impact government allocation in stand-alone, one-time agreements with a single firm for the purchase of goods or services under specified terms and conditions. In contrast, IDVs are agreements with one or more firms, and are characterized at the time of the award by uncertainty about the quantity of goods or services to be provided, the timing of delivery, or the scope of the agreement. This uncertainty might affect the tractability of our contract performance measures.[17]

The SBA set-aside is the most prevalent set-aside program, which sets aside federal procure-

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[14]The scope of action of contracting officers is defined and limited by the Federal Acquisition Regulation (FAR), a 1,942-page document that lays out policy goals and guiding principles as well as a uniform set of detailed policies and procedures to guide the procurement process.

[15]The Small Business Act defines a small business as one that is organized for profit; has a place of business in the United States; operates primarily within the United States or makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials, or labor; is independently owned and operated; and is not dominant in its field on a national basis. The business may be a sole proprietorship, partnership, corporation, or any other legal form.

[16]The SBA has implemented several measures to strengthen the eligibility examination procedures for small businesses, including requiring adequate documentation to prove small business status. These measures take place to ensure that ineligible businesses do not take advantage of small business set-asides. The rule enumerates enforcement measures; for example, the SBA shall have the right to disbar large contractors who identify themselves as a WOSB fraudulently from participating in federal procurement opportunities (Khazan, 2012). The SBA reserves the right to monitor businesses for such fraud by conducting unannounced site visits. Finally, a contracting officer or third party has the opportunity to appeal the SBA's finding of eligibility by filing a "status protest" with the Office of Hearing and Appeals (Khazan, 2012).

[17]DCs and IDVs each account for roughly half of the contract spending (GAO, 2017).

ment opportunities for small business concerns, regardless of gender.[18] The main requirement is that federal agencies generally reserve contracts that have an anticipated value greater than the micro-purchase threshold (currently $10,000), but not greater than the simplified acquisition threshold (currently $250,000), exclusively for small businesses unless the contracting officer is unable to obtain offers from two or more small businesses that are competitive with market prices and the quality and delivery of the goods or services being purchased. In addition, federal agencies generally set aside contracts that have an anticipated value exceeding the simplified acquisition threshold exclusively for small businesses when there is a reasonable expectation that offers will be obtained from at least two responsible small businesses offering the products of different small businesses (Rule of Two) and the award will be made at a fair market price.

2.2 Congressional Oversight

In the following, we briefly discuss how Congress members oversee federal agencies. In our empirical analysis in Section 7, we test if female representatives use individual or committee oversight to affect contract allocation.

Congressional oversight is one of the most important responsibilities of Congress. It refers to the review, monitoring, and supervision of federal agencies, programs and policy implementation, and it provides the legislative branch with an opportunity to inspect, examine, review, and check the executive branch and its agencies. The authority of Congress to provide oversight is derived from its implied powers in the U.S. Constitution, various laws, and House rules.[19]

To name a few, the Legislative Reorganization Act of 1946 requires House and Senate standing committees to exercise "continuous watchfulness" over programs and agencies within their jurisdiction. The amended Congressional Budget and Impoundment Control Act of 1974 strengthened the legislative branch's capacity to shape the federal budget. The Inspector General Act of 1978 established offices in several agencies to provide means for Congress to remain informed about issues related to the administration of agency programs and operations.

The most common method of oversight is through the committee structure. Throughout their histories, the House and Senate have used their standing committees as well as select or special committees to investigate federal agencies and activities. The House Committee on Oversight and Reform and the Senate Committee on Homeland Security and Governmental Affairs, which have oversight jurisdiction over the entire federal government, have been vested with broad

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[18]We exclude set-aside programs for specific types of small businesses (e.g., 8(a) small businesses, HUBZone small businesses, WOSBs, and service-disabled veteran-owned small businesses (SDVOSBs)).

[19]For an extensive summary of oversight activities, please see the Congressional Oversight Manual provided by Congressional Research Service. `https://fas.org/sgp/crs/misc/RL30240.pdf`

investigatory powers over government-wide activities. The House and Senate Committees on Appropriations have similar responsibilities when reviewing fiscal activities. Each standing committee of Congress has oversight responsibilities to review government activities within their jurisdiction.

In addition to oversight by committees, scholars also highlight the role of congressional requests as a form of individual oversight. One reason to approach federal agencies directly is constituency services by representatives, namely providing help to individuals, groups, and localities in coping with the federal government (Fenno, 1973; Cain et al., 1987). While individual members have no authority to issue compulsory process or conduct official hearings, the casework can result in findings about bureaucratic behavior and policy implementation; these, in turn, can lead to the adjustment of agency policies and procedures.

3 Empirical Framework

In this section, we discuss our identification, the empirical model, and sample construction.

3.1 Identification

The main challenge of identifying the causal effect of female U.S. House representatives on the probability that a government contract is awarded to a WOB, is that female U.S. House representatives are not randomly assigned to different congressional districts. A naive regression analysis of the government contractor's gender on the gender of the district representative might be biased because of unobserved characteristics correlating with both. For example, female empowerment or the Me Too movement might drive both their involvement in the political arena as well as in business simultaneously.

A commonly applied solution in this setting is to exploit narrowly decided elections to mitigate endogeneity concerns, see, among others, Lee (2008), Akey (2015), and Akey and Lewellen (2017). For our purpose, we focus on elections between two candidates of opposite gender that were ex-post decided by a margin of 5 percentage points or less.[20] Due to the ex-ante uncertainty regarding the outcomes, this provides quasi-random variation in election winners, implying that the gender of the winning candidate is arguably determined by pure chance. Hasan et al. (2020) use a similar empirical strategy focusing on the gender of the winner of mayoral elections.

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[20]Using a 5-percentage-point margin is standard in the literature: see Bird et al. (2017) and Jennings et al. (2020), among others. From a practical perspective, Imbens and Lemieux (2008) recommend varying the bandwidth of the assignment variable to show robustness, which we implement in Section 5.3.4.

Another identification strategy used in similar context in the literature are exogenous departures of politicians caused by sudden resignations or deaths: see Brogaard et al. (2020). This approach is not applicable in our setup for two reasons. First, there are too few exogenous departures during our sample period. In particular, only ten female representatives unexpectedly leave their office. Second, evidence presented in Section 6 suggests that the impact a female politician has on the contract allocation process persists for a long time, even after she leaves her office.

3.2 Empirical Model

In this paper, we aim at isolating the change in probability of awarding a contract to a WOB attributable to the election of a female representative. Hence, a difference-in-difference regression framework fits our setup. Treatment is defined as whether a congressional district gets assigned a female versus a male representative.[21] The quantity of interest is the interaction of treatment (female winner) and post (after the election), which identifies the change in probability that a contract is awarded to a WOB. We estimate the following specification:

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\begin{aligned}
WOB_{c,t,d(e)} = \alpha &+ \beta_1 \times \text{Female winner}_e + \beta_2 \times \text{After term start}_{e,t} \\
&+ \beta_3 \times \text{Female winner}_e \times \text{After term start}_{e,t} + \gamma_c + \eta_t + \phi_e + \varepsilon_{c,t,d(e)}
\end{aligned}
\tag{1}
$$

in which $WOB_{c,t,d(e)}$ is an indicator variable which equals one if a contract c awarded at time t and performed in a congressional district d associated with a close election e is awarded to a women-owned firm. *Female winner$_e$* is an indicator variable which equals one if the close election e is won by a female candidate. *After term start$_{e,t}$* is an indicator variable which equals one after the start of the term for election e. γ_c are contract-specific fixed effects for a 2-digit NAICS code, for an agency awarding the contract, and for a 2-digit product and service code. η_t are year-month fixed effects. ϕ_e captures election fixed effects which subsume congressional district fixed effects.

In our difference-in-difference specification, β_1 can be interpreted as a structural difference in the probability of WOBs being awarded contracts in districts that will be won by female candidates. Under the parallel trend assumption and if outcomes of close elections are truly

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[21]This implies that there is no strict control group as in standard difference-in-difference designs. Both districts experience an election. The treatment can be interpreted as not getting a male representative. See Akey and Lewellen (2017) for a similar usage of a difference-in-difference model with close elections. On a separate note, Cook and Campbell (1979) provide an argument in favor of these experimental designs to their high construct validity.

random, we expect the estimated $\hat{\beta}_1$ to be economically small and statistically insignificant. The inclusion of election fixed effects ϕ_e subsumes β_1 which hence is not identifiable. β_2 can be interpreted as the difference in probability of a contract being awarded to a female entrepreneur before and after the election, disregarding the outcome of the election. As we control for time fixed effects, which pick up the general trend that female entrepreneurs are awarded more contracts over time, we expect this coefficient to be statistically insignificant. Due to the presence of time fixed effects η_t and since general elections are held at the same point in time for all congressional districts, $\hat{\beta}_2$ is only identified due to the few special elections included in the sample, and hence is hard to interpret. Because of this, we do not report it.

The coefficient of interest is β_3, which measures the treatment effect of exogenously receiving a representation by a female House representative. It can be interpreted as the increase in probability, reported in percentage points, that WOBs are awarded contracts if a woman compared to a man wins the election.

3.3 Sample Construction

In the previous section, we refer to contracts awarded before and after close elections. This subsection describes in detail how we link contracts awarded by government agencies to an elected House representative of a respective district. Figure 1 provides a visualization.

Insert Figure 1

General elections for the House of Representatives are held in every even-numbered year, on the first Tuesday after the first Monday in November, the election day E. Congress starts its term, referenced by T, on the 3rd of January of the next calendar year, unless the preceding Congress designates a different day, and convenes for two years. We refer to the Congress a winning candidate participates in as the *Incoming Congress*, and the Congress before as the *Previous Congress*. Although special elections are off a normal election cycle, the logic of how we allocate contracts relative to the timing of election as well as term start is the same. Panel A in Figure 1 provides a timeline.

For each election, we collect data on government contracts executed in the respective congressional district. The pre-event sample consists of all contracts awarded between the term start of the Previous Congress to the election date of the close election. The post-event sample consists of all contracts awarded between the term start of the Incoming Congress and the subsequent election. In short, we exclude contracts allocated during the time between election and term start date as the outcome of the election is already known at that point in time while the winning candidate is not yet in office. Panel B in Figure 1 provides a visualization.

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A special case are close elections that are followed back-to-back by another close election. In this case, the procedure described in the previous paragraph would lead to double counting, as contracts allocated to the *Incoming Congress* of the first close election overlap with the contracts allocated to the *Previous Congress* of the second close election. In such cases, we split the period in half to avoid double counting, as visualized in Panel C in Figure 1.

Another special case is our investigation of the persistence of the effect. Does the gender of a representative affect government contracting up to four years after the initial election? In this case, we simply extend the post-event period depending on the specification, as visualized in Panel D in Figure 1. We refer to the Congress after the *Incoming Congress* as the *Subsequent Congress*.

4 Data

In the paper, we link a data set on close, mixed-gender U.S. House of Representatives elections with a data set on U.S. federal procurement contracts, both discussed in detail below. Lastly, this section lists and briefly describes the remaining data sources.

4.1 Close U.S. House of Representatives Elections

The number of women in politics in general has been increasing substantially over time, long before the start of our sample. Figure 2 provides a time series of the number of women in the office of governor, senator, and House representative, from 1950 to 2018. While there were only nine female House representatives and one female senator in 1950, the number grew to six governors, three senators, and 88 House representatives in 2018.

Insert Figure 2

For the main analysis, we collect information for all general and special House of Representatives elections beginning with the 109th and ending with the 115th Congress from the Federal Election Commission.[22] Our sample starts with the general election for the 109th Congress held on the 2nd of November 2004, and finishes with the special election on the 7th of November 2017 in the 3rd District in Utah, which John Curtis, a Republican, won over Kathie Allen, a Democrat. We do not consider elections for non-voting members of the U.S. House of Representatives.[23]

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[22]Election results were downloaded from this web page: `https://www.fec.gov/introduction-campaign-finance/election-and-voting-information/`

[23]There are six non-voting members representing District of Columbia, Puerto Rico, American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands.

The main analysis relies on close elections for identification. Similar to Lee (2001), Akey (2015), and Akey and Lewellen (2017), we compute the election margins as the difference between votes obtained by the winner and the runner-up, and define elections with margins less or equal to 5 percentage points as close. As an additional filter, we limit the data to mixed-gender races. Lastly, we only consider elections for which we can identify at least one procurement contract performed in a respective district before and after an election.

Based on these filters, our sample consists of 56 general and two special elections in 41 different congressional districts and 26 different states.[24] Of those 28 are won by female candidates. Although we identify close elections for each Congress in our sample, most close elections are from the 110th and 113th Congresses: namely 13 and 11 individual close elections, respectively. Table A2 in the Appendix provides summary statistics on the elections. In general, the elections in the sample are fairly balanced regarding the gender and party winning, whether or not there is a change in either, the age of the elected official, and the gender of the incumbent.[25] Even though there are more female Democrats running for office than female Republicans, a similar share of each of them succeeded in winning the election: 49% and 52%, respectively.

4.2 Contracts between the U.S. Government and Private Firms

We obtain the full sample of procurement contracts between the U.S. government and individual firms from the FPDS-NG. We limit the sample to contracts that are awarded competitively and that only small businesses can compete for, namely SBA set-asides. We also exclude contracts without a well-defined completion date and budget. Additionally, we require that the contract is awarded to a firm directly, meaning the contract is not awarded to the parent company and is not a part of a bundled project, the contract is awarded and performed inside the U.S. without any foreign funding, the contractor is neither a government organization nor a nonprofit organization, and that the contractor is registered in the U.S. and not foreign owned.

The Federal Acquisition Regulation (FAR) defines a business as women owned if at least 51% of it is owned by one or more women and in which management and daily business operations are controlled by at least one woman. Figure 3 presents a time series plot of the share of government contracts awarded to WOBs from 2001 to 2018.[26] After an initial increase before 2010, the share of contracts awarded to female representatives oscillates around approximately

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[24]Table A1 in the Appendix provides a list of the close elections considered in the sample, with information on candidate name, gender, and party, as well as vote margin.

[25]Personal information for individual representatives such as age, gender, and political party is obtained through the Bioguide Personal Pages from this web page: `https://bioguide.congress.gov/`

[26]In the main analysis of the paper, we consider contracts awarded in the displayed time period. However, in Section 6, which analysis the long term effects, we consider contracts up to June 2020.

20%.

Insert Figure 3

The main dependent variable is whether a contract is awarded to a WOB. Figures A1 and A2 in the Appendix showcase that there is substantial variation in our dependent variable across industries as well as congressional districts. For the sample focusing on close elections, there is a large share of contracts allocated to WOBs in the Finance and Insurance sector (50%), the Health Care and Social Assistance sector (47%), and the Educational Services sector (31%). On the lower end, a small share of contracts is allocated to WOBs in Mining, Quarrying, and Oil and Gas Extraction (13%), Public Administration (8%), and Accommodation and Food Services (6%). Figure A2 displays the share of contracts awarded to female entrepreneurs for the 114th Congress. Even within a given state there is substantial spatial variation. For example, in California's 23rd congressional district, 70% of all federal government contracts during the 114th Congress are awarded to WOBs, while only 8% of the contracts are awarded to WOBs in the 33rd congressional district.

Table A3 in the Appendix provides summary statistics for the set of all contracts between 2002 and 2018 as well as the sample used in the close election analysis. The raw sample consists of 788,998 unique contracts worth 56,400 USD initially on average, amounting to a total of 33.2 billion USD. Accounting for government contracts ex-post becoming more expensive than initially agreed upon, see Brogaard et al. (2020), the contracts in the sample amount to 44.5 billion USD spent by the U.S. government. Of those contracts, 20.2% are awarded to WOBs.

We report the following contract statistics: contract amount and contract maturity. For each contract, we report several variables specific to a contractor, namely annual revenue, number of employees, and age in years. In October 2018, FPDS-NG stopped providing information about annual revenue and number of employees. Even before that, the information was only available for around 35% of all firms.[27] Finally, we consider four measures of contract performance, namely whether a contract experienced an increase in contract amount or maturity, whether there were any modifications, and whether the contract was completed. These measures are inspired by Brogaard et al. (2020), who show that renegotiations and changes in contract conditions are fairly common.

Columns four to six in Table A3 report the same statistics for the sample of contracts associated with our main close elections specification. The last two columns report the difference with p-

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[27]For the observations with missing information, we impute the full sample median. In addition to annual revenue and number of employees, we also include an indicator variable equaling one if the information is imputed in the regression.

values accounting for standard error clustering on year and 2-digit NAICS codes. Given the size of the sample and no use of log transformations despite a certain skewness in the variables, some differences are statistically significant. Comparing the estimated difference to their standard variation as well as inspecting untabulated empirical distributions for both samples, we would argue that from an economic perspective the samples are similar.

4.3 Additional Data Sources

For some analysis, we use additional data sources, which we describe below. If not specified otherwise, these variables are used to provide additional evidence on the randomness of close elections or to reject alternative explanations.

4.3.1 Congressional Correspondence

We construct a database of congressional requests from legislators to federal agencies between 2000 and 2019 obtained through FOIA requests. We focus on the DoD and the following subagencies: Office of Inspector General, Defense Commissionaire Management agency, and Defense Contract Management. The choice is due to relevancy, responsiveness to our FOIA request, and the quality and amount of the obtained data, in particular whether or not information on the topic of request is available. The limit to the DoD is due to its predominant role in procurement contracting: approximately 60% of all contracts are awarded by it. From more than 35,000 individual requests, we exclude travel requests and count the number of general but also contract-specific requests by individual representatives.[28]

4.3.2 Committee Membership

To construct the history of committee assignments, we use two sources, namely Charles Stewart's Congressional Data Page and the websites of congressional committees.[29]

4.3.3 System for Award Management

To assess the pool of firms that are willing and able to participate in federal contracting as well as for the construction of firm age, we use the SAM, a continuously updated administrative system for the registration of current and prospective federal contractors.[30] To conduct any business with the federal government, a firm needs an active registration in SAM. We merge

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[28]We develop a codebook to classify correspondence by type and to identify contacts related to government contracting.

[29]We thank Charles Stewart for providing the data on his personal website `http://web.mit.edu/17.251/www/data_page.html`.

[30]Data was obtained from this web page: `https://www.sam.gov/SAM/`

the data from SAM and FPDS using DUNS numbers which are uniquely assigned to private firms.

4.3.4 Women in Politics

Women Elected Officials Database constructed by the Center for American Women and Politics (CAWP) provides information about female legislators in different levels of political offices during the last century.[31] We use this data to estimate the preexisting political presence of women in different levels.

4.3.5 Small Business Ownership per Gender in Congressional Districts

To construct a proxy of small business ownership per gender, we use the Current Population Survey by the Census Bureau.[32] We measure business ownership by the share of survey respondents who own a business and are working, combined with information of the respondents' gender. This measure is introduced, motivated, and validated by Fairlie (2020).

4.3.6 Bias against Women Pursuing Careers

We obtain a continuous measure of implicit and explicit bias against women pursuing careers, the Gender-Career Implicit Association Test (IAT), from Harvard's Project Implicit.[33] The measures are based on individual online tests and are used in Finance by Brock and Haas (2020) and Giannetti and Wang (2020), among others.

4.3.7 Additional Hand-collected Data

Using internet search, we manually gather information on the gender of the head of federal agencies, the local district roots and the business background of female candidates, the women's business centers supported by SBA, and the ratification of the Equal Rights Amendment by states.

5 Main Result

This section documents that the election of a female representative causes more government contracts to be allocated to WOBs. We start with a naive regression before moving to inference

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[31]Data was obtained from this web page: `https://cawp.rutgers.edu`

[32]Data was obtained from this web page: `https://www.census.gov/programs-surveys/cps/data.html`

[33]Please see the project web page: `https://implicit.harvard.edu/implicit/`. The data was obtained with zip codes from `https://osf.io/abxq7/wiki/home/`

using close elections. To corroborate the claim that the observed effect is caused by the gender of the elected official, we end this section with evidence on the randomness of the election outcomes and on similarities between treatment and control groups, followed by tests for parallel trends and robustness to varying definitions of a close election.

5.1 Unconditional Correlations

We start by investigating correlations between a gender of a district representative and a probability of awarding government contracts to WOBs. In particular, we estimate the following model:

$$WOB_{c,t,d} = \alpha + \beta_1 \times \text{Female representative}_{t,d} + \gamma_c + \eta_t + \phi_d + \varepsilon_{c,t,d} \qquad (2)$$

in which *Female representative*$_{t,d}$ is an indicator variable which equals one if the congressional district d at time t is represented by a female legislator. Besides variables that are defined in Section 3, we include additional election-specific controls such as an indicator if a politician is Republican and whether she is in the same party as the president, the House majority, and the Senate. Lastly, we include Congress and congressional district fixed effects. For this analysis, we consider the full sample of all government contracts.[34]

The main coefficient of interest is $\hat{\beta}_1$, which measures how much more likely it is that a contract is allocated to a WOB in congressional districts with female representatives. Table 1 presents the results. Throughout the paper, we use linear probability models rather than logit or probit. As noted by Maddala (1987) and Greene (2004), probabilistic models are biased in the presence of large number of fixed effects.

Insert Table 1

The model reported in column one only includes Congress and congressional district fixed effects. The former is included as both the dependent and main independent variable exhibit a positive time trend; see Figures 2 and 3. We include congressional district fixed effects, as we are interested in variation within district levels rather than between-district variation. The presence of a female representative correlates with a 1.8% higher allocation of government contracts to WOBs, significant at the 1% level.

Successively including controls and fixed effects, moving from model one to model four leads to

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[34]The difference in number of observations in Table A3 and Table 1 is because we do not consider contracts executed between election date and term start date, as well as due to the exclusion of non-voting members in Congress, limits which we have not applied to Table A3.

a slightly higher coefficient with similar statistical significance. In models one to four, standard errors are clustered on year and industry level, while in the final model, we add an additional cluster on congressional district.

From an economic perspective, the effects are roughly equal to 10% of the unconditional probability and a third of the unconditional change from 2002 to 2018. Nevertheless, these results are only indicative as the inference might be subject to endogeneity bias.

5.2   Difference-in-Difference Estimator

We use a difference-in-difference regression framework to isolate the change in probability of awarding a contract to a female entrepreneur attributable to the election of a female representative. Table 2 presents the results from estimating our main Equation 1. The coefficient of interest is the interaction between the gender of the elected official and post-event indicator, which can be interpreted as the increase in probability, reported in percentage points, that women-owned firms are awarded contracts if a woman compared to a man wins the election.

Insert Table 2

After the election, the probability of a contract being awarded to a women-owned firm increases by 5.0 to 6.2 percentage points, depending on specification, if the newly elected representative is a woman. In model one, we only control for time and election fixed. In the remaining models, we successively include controls and additional fixed effects, which only affects magnitudes marginally. Statistical significance is at the 1% level for all specifications. The fact that the inclusion of very granular fixed effects in models five and six do not affect the economic magnitude suggest that reallocation of contracts, for example, to products more likely to be offered by WOBs, is not driving our results.

From an economic perspective, the magnitudes are substantial. The effect amounts to 30% of the unconditional probability; see Table A3. Relating the estimate to the time series trend in Figure 3 makes the effect even more pronounced. The unconditional probability that a government procurement contract is awarded to a WOB, increased from 14.0% in 2002 to 20.4% in 2018, a change of 6.4 percentage points, almost identical to the effect we attribute to the election of a single female representative. Comparing the estimates from the naive regressions in Table 1 and the results using the difference-in-difference model, we conclude that endogeneity issues bias the naive coefficients downward.

5.3 Validity

In this section, we provide empirical evidence on potential validity concerns. To preview this section, we argue for a causal interpretation. In particular, we provide evidence that there are no discontinuities in the assignment variable, the female vote margin. In addition, based on several measures relating to female involvement in politics and business, both groups of congressional districts look similar ex-ante. We also show the presence of parallel trends before treatment. Lastly, variations in the vote margin threshold, which defines a close election, do not affect our results.

5.3.1 Distribution of Assignment Variable

The identifying assumption of our empirical strategy is that in mixed-gender close elections, it is extremely difficult to predict a winner and hence the gender of an elected representative is as if randomly assigned. This implies the absence of a discontinuous jump of the assignment variable around the cutoff, which would be a serious threat to internal validity (Imbens and Lemieux, 2008).

Insert Figure 4

Both panels in Figure 4 display histograms of election outcomes along the vote margin, defined as the difference between the votes received by the female candidate minus the votes received by the male opponent. A vote margin above zero indicates that the female candidate won. The upper panel includes all elections with vote margins between -75 and 75 percentage points, and suggests that a female candidate on average loses against a male candidate. However, the lower panel focuses on elections between -5 and 5 percentage points of vote margin, capturing all close elections in our sample. The histogram shows an even distribution of elections across the vote margin, hence the absence of any bunching.

5.3.2 Covariate Balance Tests

Next we investigate whether congressional districts won by women are similar to the districts won by men ex-ante in observable characteristics. Figure 4 Panel A displays the share of government contracts allocated to WOBs during the Previous Congress for all elections with vote margins between -75 and 75 percentage points. The dots indicate local averages for bins of the size of 10 percentage points. The grey bars indicate the 90% confidence intervals of the estimated bin average. In addition, we display a fitted regression line modelling the relationship with a second-order polynomial interacted with an indicator if the female candidate won. Although in congressional districts that are won by a clear margin by a male candidate, fewer

contracts are awarded to WOBs, there is no discontinuity around the cut-off.

Insert Figure 5

As any unobserved variable correlating with both the dependent and independent variable might pose a threat to exogeneity, we repeat this analysis for three other variables capturing the involvement of women in business as well as politics, measured before the election. In particular, we investigate whether there are any discontinuities for the share of small businesses owned by women (Panel B), the implicit bias against women (Panel C), and the share of female state representatives from the state during the previous Congress (Panel D). For all variables the conclusion is the same. Although there is expected variation and trend along all elections — for example, in congressional districts where women lost by a large margin, there is more implicit bias against them — there is no discontinuity around the cut-off.

In untabulated results, we confirm in a more formal test that there is no significant jump around the cut-off using regression analysis, controlling for time trends and unobserved factors.

5.3.3 Parallel Trend

Inference using the difference-in-difference rests on the parallel trend assumption, stating that treatment and control would have behaved similarly in the absence of treatment. Table 3 presents the results of a specification that includes interactions of an indicator equaling one if the winning candidate is female, with time dummies for every half year leading up to the event. The six months before the term start are omitted and act as a benchmark. If treatment and control units behave similarly pre-event, we expect the interaction of the treatment dummy and the time intervals before the event to be economically small and statistically insignificant. In line with the parallel trend assumption, the gender of the winning candidate does not affect the probability that government contracts are awarded to WOBs pre-event. However, all time periods after the event are positive and significant. Notably, the effect materializes quickly. The interaction coefficient for the first six months is already statistically and economically significant, and comparable with the coefficients in the later periods. A strong effect during the first months of the Incoming Congress is in line with evidence provided by Stein and Bickers (1994). They show that politicians use awards in the beginning of their terms to deter potential challengers.

Insert Table 3

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5.3.4 Definition of Close Election

To disperse concerns that a 5-percentage-point vote margin threshold is too wide to identify elections with ex-post random outcomes or that it is cherry picked, we redo the analysis for all mixed-gender elections, imposing different vote margin thresholds defining a close election. Given the vote margin, we construct the respective sample of contracts as described in Section 3.

Insert Table 4

Decreasing the vote margin from 10 to 1 percentage points hardly affects the statistical significance of our effect, but increases its economic magnitude, as shown in Table 4. For all models, the estimated effect is significant at least at the 5% level, and is increasing in economic magnitude when limiting the vote margin. Notably, for all models the probability of a female candidate winning the election is close to 50%, ranging between 44% to 55%, which further supports the claim that the outcome of these elections is hard to anticipate.

6 Statistical Bias with Inaccurate Beliefs

In this paper, we show that female representatives cause an increase in contracts allocated to WOBs. This might be good from a welfare perspective, given the evidence on gender bias in the procurement process (Bates, 2002; Beede and Rubinovitz, 2015) and policy effort to decrease it (Dilger, 2020). However, previous evidence suggests that politicians also influence contract allocation due to private benefits (Goldman et al., 2013; Tahoun, 2014; Schoenherr, 2019; Brogaard et al., 2020). To give an example in our setup, reelection concerns might motivate allocating more contracts to female contractors as a form of favoritism that ultimately results in worse outcomes for the government as contract execution erodes.

In this section, we investigate the consequences of the impact of female leadership on government contract allocation from the perspective of gender discrimination. We use the dynamics around the election of female representatives to differentiate between accurate statistical discrimination (Phelps, 1972; Arrow, 1998), inaccurate statistical discrimination (Bordalo et al., 2016; Bohren et al., 2020), and taste-based discrimination (Becker, 1957).

Taste-based discrimination is unequal treatment that is not explained by economic motivations but instead related to individual preferences and cultural beliefs about gender. Statistical discrimination with accurate beliefs justifies the discrimination on the grounds of accurate beliefs about performance. Bohren et al. (2020) stress the importance of the alternative that the beliefs about the minority are inaccurate.

In short, we argue that the evidence is consistent with the latter, namely that female representatives reduce an existing statistical discrimination with inaccurate beliefs.[35] Before female representatives enter office, the belief that WOBs would perform worse if given contracts dominates. Because of female representatives, these beliefs are corrected and an increased share of contract allocated to WOBs persists.

In this section, we provide three pieces of evidence that are consistent with the inaccurate statistical discrimination explanation. First, the effect persists after the female representative leaves office, even if she is replaced by a male representative. Second, the effect is stronger in districts with no female representation prior to the elections. Lastly, the performance of WOBs in districts with female leadership is similar to weakly better compared to WOBs in male-represented districts.

Most importantly, these three pieces of evidence are inconsistent with accurate statistical and taste-based discrimination. If the impact on contract allocation by female representatives were driven by them, we would find the effect leading to worse performance, not dependent on prior female representation, and not persistent.

6.1 Persistence

There is a dynamic dimension in inaccurate statistical discrimination. While initial prejudices and the lack of knowledge might result in inefficient contracting, the subsequent learning about members of the other group, in turn, will reduce the discrimination. This implies in our setup that even after the female representative leaves office, her past presence still affects discrimination against the minority in the future due to changes in the beliefs or in the presicion of the beliefs that the majority holds about the competence of the minority group (Bertrand and Duflo, 2017). For example, Beck et al. (2018) conclude that lower bias among loan officers with higher exposure to opposite-sex borrowers allows them to rule out the existence of a pure taste-based gender discrimination.

To test whether the effect attributable to the election of a female representative persists longer than her initial term, we estimate an extended version of Equation 1,

$$
\begin{aligned}
WOB_{c,t,d(e)} = {} & \alpha + \beta_1 \times \text{Female winner}_e \times \text{Incoming Congress}_{e,t} \\
& + \beta_2 \times \text{Female winner}_e \times \text{Subsequent Congress}_{e,t} + \gamma_c + \eta_t + \phi_e + \varepsilon_{c,t,d(e)}
\end{aligned}
\tag{3}
$$

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[35]See Bordalo et al. (2016); Bohren et al. (2020).

The only difference to our main specification is that instead of interacting *Female winner* with an indicator equaling one after the start of the term, we include two separate indicators, one for the Incoming Congress and one for the subsequent one. The sample covers a longer time period, namely government contracts awarded up to 48 months after the term start date. Please see Figure 1 Panel D for a visualization of the sample construction. Please note that we do not show the individual effects of the main indicator variables in the equation as they are subsumed by fixed effects.

Insert Table 5

Column one shows that the effect persists, as the interaction between *Female winner* and *Subsequent Congress* is positive and significant at the 1% level. In fact, we fail to reject the null hypothesis that the effect during the Subsequent Congress is lower than during the Incoming Congress.

Before moving to other presented models, Figure 6 visualizes the persistence. Similar to the parallel trend analysis in Section 5.3.3, we identify the interaction individually for each half-year period, with the six months before the event as benchmark. The main takeaway is that for each half-year period after the term start, the effect is positive and significant even after the start of the Subsequent Congress.

Insert Figure 6

As a next step, we investigate if the effect persists depending on whether a representative got reelected. In case she was not reelected, does a gender of successor play role? In columns two and three in Table 5, we consider the subsample of elections in which female candidates are reelected while columns four to six consider the opposite case.

Model two considers elections in which a female representative is reelected. The coefficient becomes statistically insignificant because of female candidates already being incumbents in several of these elections. We do not expect any effect in such scenarios. Model three considers only elections in which a winner of the close election is not an incumbent. The election of a female representative has a positive, significant, and persistent effect.

The last three models investigate the scenarios in which a female representative does not get reelected. In columns five and six, we separately consider elections when a winner gets replaced by a male or by a female representative after her first term. It is somewhat surprising that the effect is stronger if the female representative is replaced by a man. Taken together, the effect persists in all specifications.

Our results are consistent with the existence of gender discrimination and learning effects that lead to the reduction of that discrimination. The effects are inconsistent with taste-based discrimination, which predicts that the gender of the successor would either lead to reversal or persistence. Beaman et al. (2012) find similar patterns in a separate context. They show that female leaders in India invest in goods that women prefer, in their case drinking water. Similar to the presented results, the investment in drinking water persists even after women have left power.

6.2   Prior Female Political Presence

The initial unequal treatment of contractors based on gender is consistent with both taste-based discrimination as well as statistical discrimination with inaccurate beliefs. In the case of statistical discrimination with initially inaccurate beliefs, the majority group, male legislators, may be reinforced in their belief that the minority group, female business owners, is incapable of success since they have rarely observed the success of the minority in practice.[36,37]

For example, many businesses are located in districts where women are representing them in every election while others are in districts where there have been no female representatives for a long time. For example, in states like California, there is continued exposure to women political leadership. However, in districts where there have been no prior female representatives, having the first female representative is likely to be a catalyst for changes in contract allocation.

In cases where male representatives have inaccurate beliefs about and lack of exposure to WOBs, we expect that the impact of female representatives is stronger if that district has not been exposed to female representation in the near past. We separate districts into the ones with and without female political representation before 2004 and estimate Equation 1. Prior female political representation is defined by having had at least one female governor, senator, or House representative representing the state or district before 2004. We use measures computed before the first close election in 2004, as there was a strong increase in female political participation during the sample period; see Figure 2.

Because of this, computing the measures contemporaneously would imply that we split elections based on whether they are at an early or late point in the sample. This might bias our inference as the main dependent variable also experienced an upward trend; see Figure 3. Nevertheless, for congressional district, we also compute female representation during the last ten

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[36]We acknowledge that both types of discrimination might coexist and reinforce each other.

[37]Recent empirical work provides evidence for inaccurate statistical discrimination in the market for entrepreneurial equity (Hebert, 2020; Ewens and Townsend, 2020). We instead investigate biased beliefs in the product market.

years.[38]

For models one to six in Table 6, we find similar patterns. If there is no female political presence in a congressional district or the state the district is located in, the effects are large and significant. The election of a female House representative causes an increase in the probability that a government contract is awarded to a WOB by 6.7 to 9.9 percentage points. If there is female political presence before, there is an insignificant effect. Models seven and eight, which use measures of female representation computed over the last ten years before the election, show a relationship in the same direction, but muted.

The evidence in this subsection is inconsistent with both taste-based discrimination and statistical discrimination with accurate beliefs.

6.3 Contract Execution

In this subsection, we ask if the performance of WOBs is worse in districts with female versus male representation. If female representatives allocate contracts to WOBs due to favoritism, we would expect the performance to erode. We estimate the following model using ordinary least squares:

$$\text{Performance}_{c,t,d(e)} = \alpha + \beta_1 \times \text{Female winner}_e + \beta_2 \times \text{Women-owned business}_{c,t,d(e)}$$
$$+ \beta_3 \times \text{Female winner}_e \times \text{Women-owned business}_{c,t,d(e)} + \gamma_c + \eta_t + \phi_e + \varepsilon_{c,t,d(e)} \tag{4}$$

in which *Performance* measures contract performance. We use four binary measures of performance, all indicating if a contract is executed as initially agreed upon. Specifically, we measure performance with indicators equaling one if a contract does not experience an increase in contract amount (model one) or maturity (two), if there are no modifications (three), and if a contract is completed (four). In general terms, a value of one can be interpreted as better performance.[39]

Women-owned business is an indicator variable which equals one if a contract is executed by

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[38]This is motivated by changes in congressional borders caused by congressional redistricting. Hence, a more short-term perspective (ten years is the cycle of census and hence redistricting) might give a more accurate picture of female representation of the inhabitants of the current district.

[39]We assume that initial contract terms are not affected by the gender of the district representative.

a WOB. All other variables are as specified in the previous models. The sample consists of all contracts that are awarded between the term start of the representative and the subsequent election which are not executed instantaneously; in other words, the contract maturity is strictly non-zero.

<div align="center">Insert Table 7</div>

The main coefficient of interest is β_3, measuring whether the performance differential between women-owned firms and non-women-owned firms depends on the gender of an elected House representative. Table 7 reports the results. For all models the coefficients are positive with model four being significant at the 10% level.

Even though performance measures in models one and four have a fairly low number of cases for which the indicator variable equals one, untabulated results suggest that coefficients are stable regarding changes in specification. Notably, the estimated $\hat{\beta}_2$ suggests that women-owned firms unconditionally do not perform worse or better than non-women-owned firms.

To sum up, women-owned firms in districts represented by female legislators either outperform or do not perform worse than WOBs in male-represented districts. Together with previously reported results, this leads us to the conclusion that our results are not driven by taste-based discrimination nor by accurate statistical discrimination.

7 Oversight and Government Contracting

Federal agencies are responsible for the allocation of government contracts and argue that the process is not influenced by legislators. To quote John C. Johnson, ex-assistant commissioner of GSA's Federal Technology Service, "I've never had a member of Congress do that, and no, it wouldn't have any effect. The process is very well-defined in terms of how we make selections."[40] Nevertheless, the opposite has been shown empirically. For example, board connections to the ruling party (Goldman et al., 2013), political contributions (Brogaard et al., 2020), and ownership stakes by politicians (Tahoun, 2014; Schoenherr, 2019) impact the allocation and terms of procurement contracts. In this section, we investigate congressional oversight as a potential mechanism of how contract allocation is affected by female legislators.

Oversight occurs through a wide variety of channels, organizations, and structures. In this section, we investigate oversight through committees as well as individual oversight.

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[40]https://www.govexec.com/magazine/features/2005/12/schmooze-or-lose/20778/

7.1 Individual Oversight

It is common practice for congressional representatives to write letters to the SBA, the GSA, or any other relevant agency advocating for their constituents who consider applying or have applied for SBA contracts. Many House representatives provide designated links regarding direct help in contacting federal agencies. By contacting agencies directly, legislators can send signals of their priorities, but without waiting for a scheduled hearing.

To give an anecdotal example of constituency service related to female representatives supporting women-owned firms: Diana DeGette, a Democrat from Colorado, approached the GSA on behalf of Ms. Carol McCallister, owner of Champion Business Services in Aurora. The representative expressed Ms. McCallister's concern of competing with companies such as GAP Solutions, Inc. In the reply, SBA mentions that they "can counsel Ms. McCallister on the WOSB Program and other strategies for increasing her ability to win federal contracts. In addition, the SBA's Procurement Center representative in Denver, Colorado, offered to meet with Ms. McCallister to provide direct assistance. Consistent with this example, Lowande et al. (2019) find that female legislators contact agencies more on behalf of women.

If an agency aims to grow its coalition of political supporters, we would expect them to frequently accommodate congressional requests. For example, agencies may want to avoid the increased political uncertainty that accompanies a change in congressional representation. The agencies might also achieve their goals through linking legislators' interests with those of the contract through the selection of contractors. The agencies might select firms among key legislative constituents. Contracts combine the interests of district economies and legislators with those of the agencies. To sum up, complying with legislators' requests may help agencies to achieve their own goals.

Using FOIA requests, we gather data on communication between female legislators and the DoD and several of its subagencies.

Insert Table 8

Table 8 investigates if congressional requests by female legislators act as an amplifier of our main effect. Models one to three consider levels while models four to six consider changes relative to the previous district representative. We show that the increase in contracts allocated to WOBs is bigger for female legislators who actively engage in individual oversight through communication with the DoD.

7.2 Committee Oversight and Political Alignment with the Majority

Committee members may apply political influence through their formal oversight role. By focusing on close elections for causal inference, the legislators in our sample are not likely to be senior and hence may never attain a powerful committee position. However, we argue that alignment with the majority party and hence the committee chair ought to have a similar effect. Moreover, both committees and parties are key gatekeepers for authorization and appropriation of federal funds.

We run difference-in-difference regression interacting a dummy equaling one after the term start with a dummy equaling one if the winning candidate is from the same party as the House majority, the Senate majority, or the president at the time of the Incoming Congress.[41] For this analysis, we only consider elections won by female legislators.[42]

<center>Insert Table 9</center>

Models one to three in Table 9 show that being a majority party member is a substantial moderator of our main effect for female candidates. The effects are fairly notable as they are approximately twice as big as our estimates in Table 2. In short, we find that alignment with the Presidency, the Senate majority, and the House majority is a moderator rather than an amplifier.

The slightly unexpected results can be reconciled with evidence in the political science literature. On the one hand, it would seem intuitive that politicians with power in Congress, either as part of committees or the majority, will have more impact on contract allocation (Cohen et al., 2011; Goldman et al., 2013; Dynes and Huber, 2015; Kasdin and Lin, 2019). On the other hand, they will spend much of their time in Washington on policy work and as a consequence have less time for individual constituents in the district (Berry et al., 2010). Starting with Fenno (1973), political science literature explores a trade-off between representation from elected officials who wield institutional power within Capitol Hill and elected officials who are attentive to the district. Grimmer and Powell (2013) provide empirical evidence of this trade-off by showing how powerful committee assignments empower representatives' legislative careers and act as a substitute for electoral support. Our results in this section are consistent with this trade-off.

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[41]The presidential inauguration is scheduled later in January than the start of the new Congress. Taking this into account, we consider alignment with the incoming presidential administration.

[42]Untabulated results show that the effect is absent for male representatives.

8 Potential Alternative Mechanisms

In this section, we discuss several alternative mechanisms which we are able to rule out.

8.1 Role Model

Through their presence, female legislators might affect behavior by WOBs which potentially could lead to an increasing share of government contracts allocated to them. These role model effects are documented in other circumstances: see Beaman et al. (2012); Kedia and Pareek (2020). Table A4 in the Appendix provides evidence against the role model hypothesis. Using data on registrations of potential government contractors within SAM as well as data on female business ownership, we find that female representation has no effect on the pool of WOBs. In an additional test, we also find that female representation has no effect on the number of offers for a given government contract. Hence, we reject the role model hypothesis.

8.2 Networks

Another potential explanation is existing networks between politicians and firms. Following Hunt (2019), we construct several proxies for a legislator's local network, such as whether the legislator was born in the district, whether she had local political experience, or whether she was a business owner before starting a political career. Table A5 provides no evidence of the network effect. Moreover, this effect is not consistent with our empirical findings regarding persistence and historical female presence as a moderator. In addition, due to the focus on small businesses and the fact that our sample consists of thousands of unique firms, this mechanism is unlikely.

8.3 Changes in Contract Terms

We consider contract amount and contract maturity as the relevant contract terms. Table A6 shows that the terms are not affected by the gender of a legislator.

8.4 Agencies Led by Women

One might argue that the effect documented in this paper is driven by female legislators shifting government contracts to agencies that are led by women which are more likely to respond to the representative's preferences because of shared gender identity.

We gather data on the gender of government agency heads and test whether there is a relationship to contract allocation. We do not find any evidence that either female legislators shift

toward female-led agencies or that female-led agencies award more contracts to women than other agencies do.

8.5 Women's Business Centers

Instead of actively affecting the process of contract allocation, legislators can also help their constituents by offering resources to overcome obstacles that they face in applying for government contracts — for example, by supporting SBDCs in their districts.

We gather data on SBDCs, in particular location and founding year. Matching this data with our sample of close elections, we do not find any overlap. Some SBDCs are placed in districts that are part of our sample, but none of them was founded around close elections won by a female candidate.

8.6 Ratification of Equal Rights Amendment by States

"The Equal Rights Amendment is a proposed amendment to the United States Constitution designed to guarantee equal legal rights for all American citizens regardless of sex".[43] Its first version was introduced in Congress in 1923. Nevertheless, as of this writing only 38 states have ratified this amendment. Potentially a year of ratification in each state might reflect a structural change in the attitude towards women in business. However, during the time period of our sample only two states ratified the ERA, namely Nevada and Illinois, in 2017 and 2018, respectively.

9 Conclusion

In this paper, we provide novel evidence that female political representation causes an increase in government contracts allocated to WOBs. We address endogeneity by exploiting narrowly decided mixed-gender elections. To corroborate the claim that the gender of the representative causes the change in allocation, we provide various tests for validity.

We suggest that the impact of female representatives mitigates the consequences of statistical discrimination with inaccurate beliefs in the government procurement sector. Using data on congressional requests obtained through FOIA requests, we argue that female legislators use individual oversight to influence the government contract allocation process.

Taken together, we provide evidence that discrimination is lessened by exposure to leaders from

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[43]https://www.equalrightsamendment.org/

the groups that are discriminated against. In the case of biased government contract allocation, the effect of female representation is sizable and can act as a substitute to dedicated programs targeting WOBs.

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(a) Election time line

(b) Stand-alone election

(c) Back-to-back close election

(d) Persistence analysis
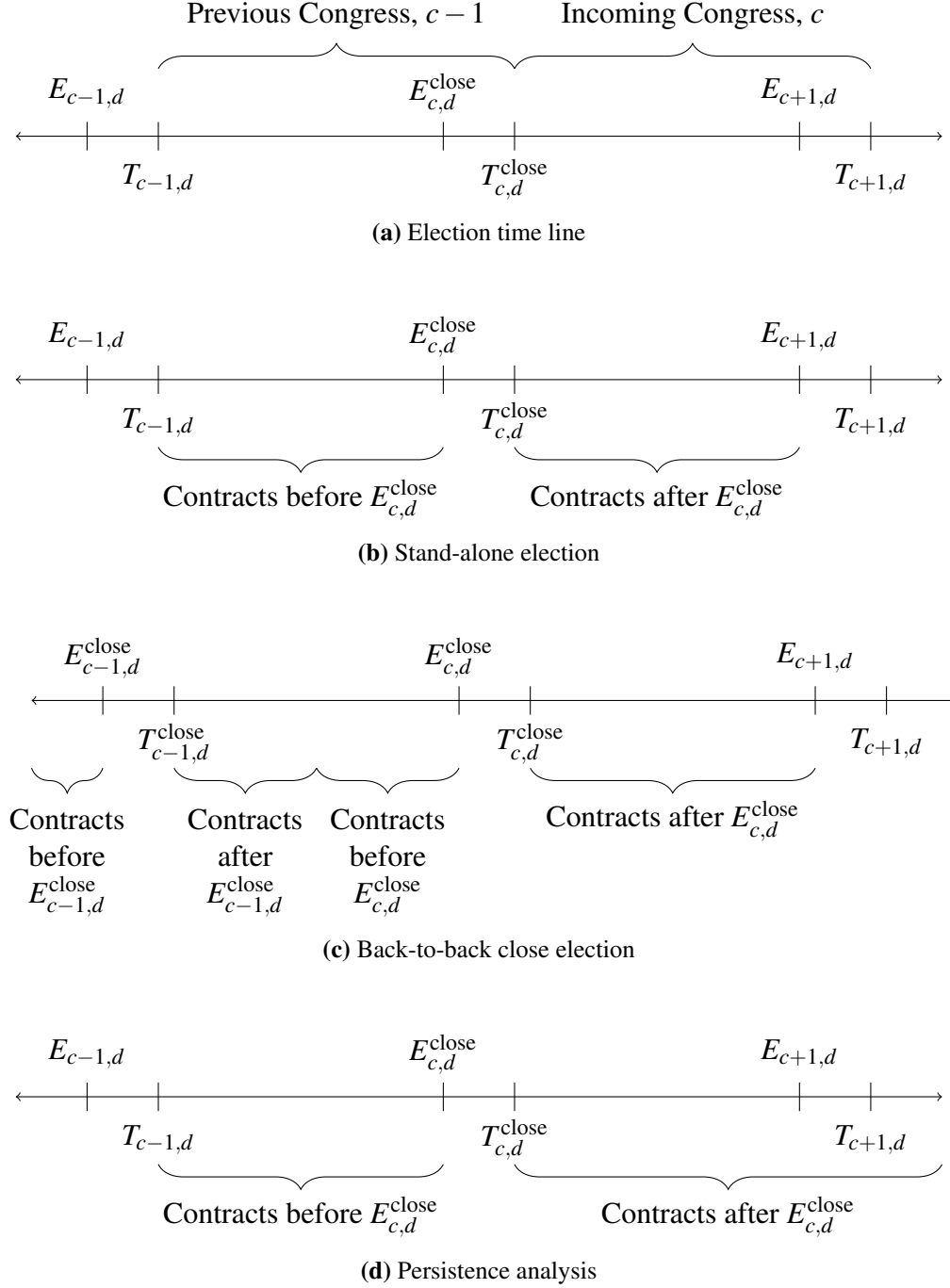
This figure visualizes the timeline around elections, panel (a), and the link between government contracts and close elections for three cases, panel (b) stand-alone close election, panel (c) back-to-back close elections, and panel (d) persistence analysis. General elections E for Congress c in congressional district d are held in every even-numbered year, on the first Tuesday after the first Monday in November. The Congress starts its term T on the 3rd of January of the next calendar year. Curly brackets indicate the time for which government contracts will be linked to a close election, before and after the election.

Figure 1: Visualization of sample construction
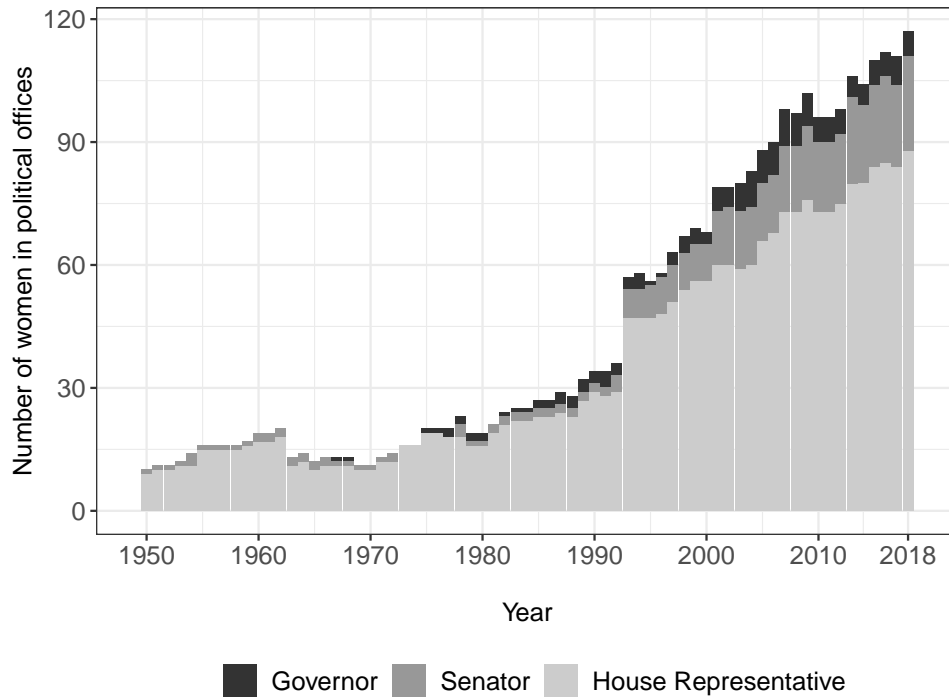
The bars indicate the number of women in political positions in the U.S. over time. Black bars indicate the office of governor, dark grey of senator, and light grey a member of the House of Representatives. The data is obtained from the Center for American Women and Politics (CAWP), webpage: https://cawp.rutgers.edu.

Figure 2: Number of women in U.S. politics over time
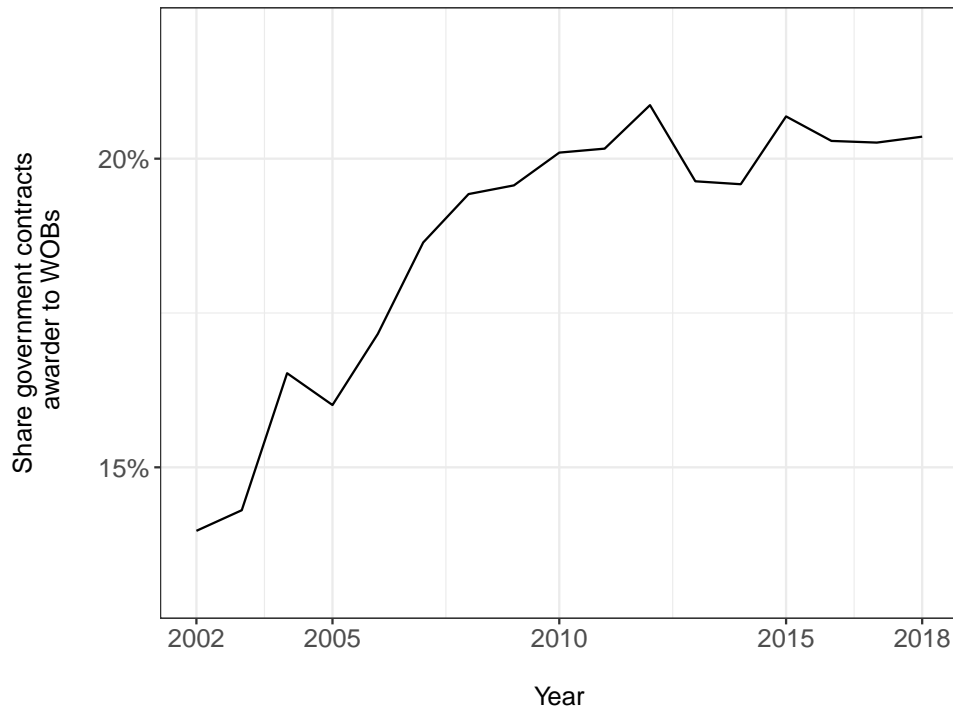
The solid line indicates the share of government contracts allocated to WOBs. The sample considers all competitive contracts awarded under the SBA program between 2002 and 2018.

Figure 3: Share of government contracts awarded to women-owned businesses over time
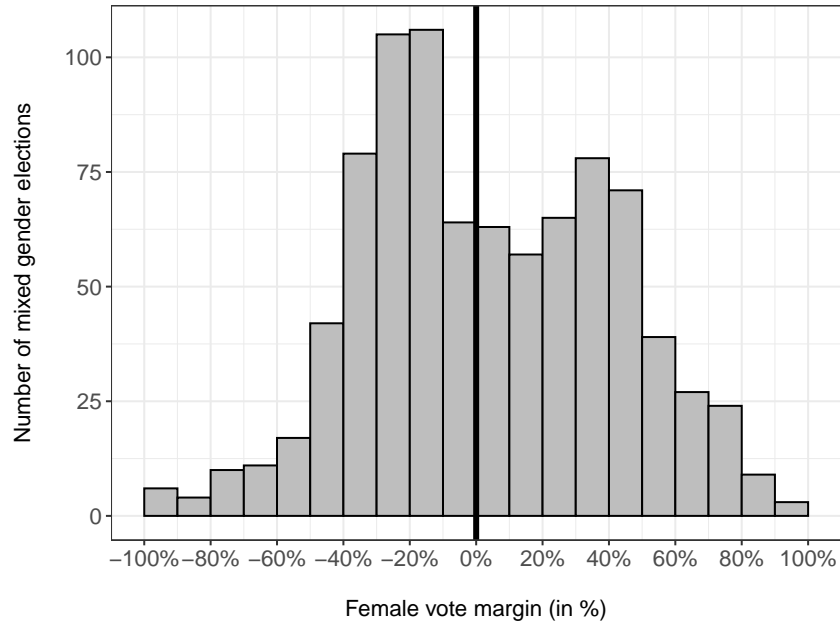
(a) All mixed-gender elections
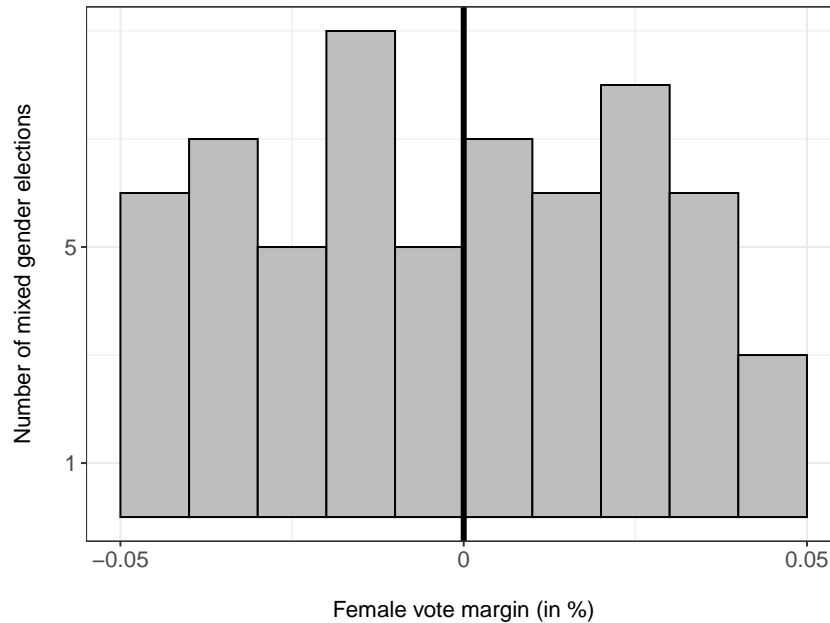
(b) Mixed genders with a vote margin ≤5%

The figure displays a histogram of individual elections along the female vote margin. The sample consists of elections between a male and a female candidate for the 109th to the 115th Congresses. The x-axis displays the female vote margin, defined as the difference between the votes received by the female candidate minus the votes received by the male candidate. The upper panel considers all mixed-gender elections, while the lower panel considers a range from -5% to 5%, which corresponds to our main sample.

Figure 4: Histogram of female vote margin
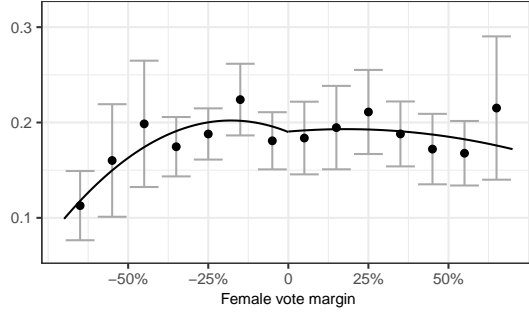
(a) Share of government contracts allocated to women-owned businesses
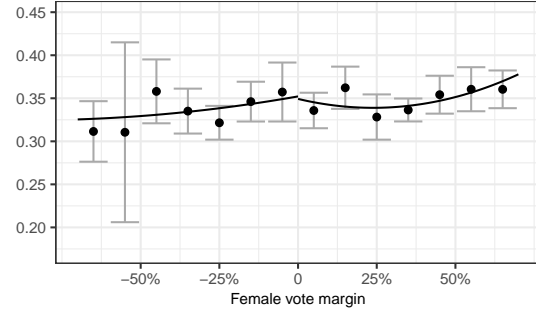
(b) Share of small businesses owned by a woman
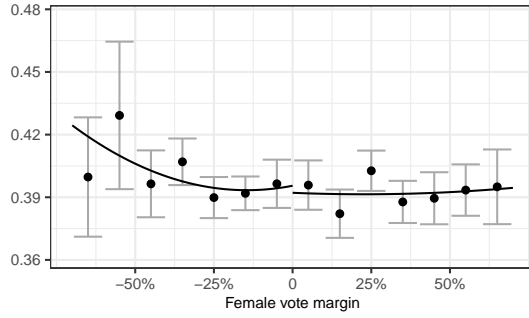
(c) Implicit bias against women
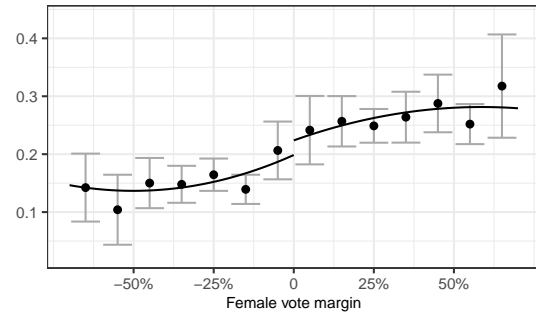
(d) Share of state representatives who are female during the previous Congress

This graph plots covariates against the female vote margin whereby a negative margin indicates an election loss of a female candidate and a positive margin an election victory for the female candidate. We report the share of government contracts allocated to WOBs, the share of small businesses owned by a woman, the implicit bias against women, and the share of state representatives who are female during the previous Congress. Each of the dots is the average value of the covariate in vote margin bins of length 10% for the sample of elections with vote margins ranging from -75% to 75%. The grey bars indicate 90% confidence intervals for the bin mean. The solid black lines are fitted to the raw data using a second-order polynomial interacted with a dummy equaling one if the female candidate won.

Figure 5: Covariate balance test
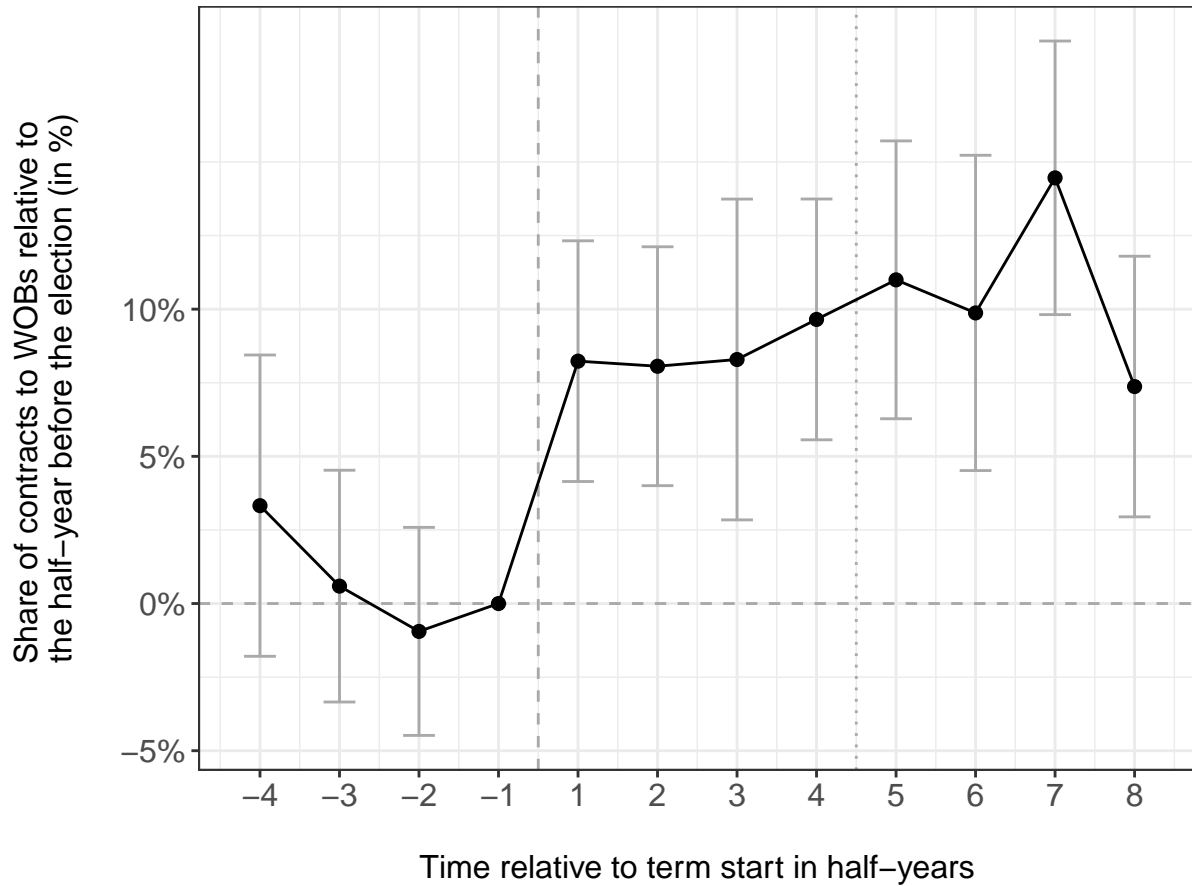
This plot shows the percentage point change in government contracts allocated to WOBs attributed to the election of a female House representative relative to the half year before the term start. The coefficients and 10% confidence intervals are from a regression similar to the regression in Tables 3 and 5. The dashed vertical line indicates the respective close election while the vertical dotted line indicates the subsequent election. The sample considers all contracts awarded within the SBA program performed in districts that experience close elections. For each close election which is not subsequent to another close election, we consider contracts between the previous term start and 48 months after the respective term start. Contracts between the election date of the close election and term start are excluded.

Figure 6: Share of contracts allocated to WOBs over time

Table 1: Panel regression explaining the probability of a government contract being awarded to a female entrepreneur

This table examines whether the presence of female House representatives correlates with the probability that a government procurement contract is awarded to a WOB. Each column displays the results of a panel regression with a dummy indicating whether a given contract is awarded to a business owned by a woman as dependent variable. The main independent variable is a dummy indicating if a congressional district is represented by a female representative. We gradually consider controls as well as fixed effects for each Congress, congressional district, 2-digit NAICS industries, year-month, awarding agency, and 2-digit product and service code. Coefficients are reported in percentages. For each elected official in the House of Representative between the 109th and 115th Congress, we consider contracts between his or her term start to the subsequent election. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. For the last model, we include a cluster for congressional districts. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Contract awarded to a women-owned business				
Female Representative	1.80***	1.71***	2.38***	2.28***	2.28***
	(0.47)	(0.43)	(0.54)	(0.53)	(0.71)
log(Number of employees)		−4.06***	−3.98***	−3.95***	−3.95***
		(0.23)	(0.29)	(0.29)	(0.33)
log(Annual revenue)		0.21**	0.21**	0.21**	0.21*
		(0.07)	(0.08)	(0.08)	(0.10)
Financial data missing, indicator		−1.46***	−1.56***	−1.54***	−1.54***
		(0.35)	(0.34)	(0.35)	(0.38)
log(Firm age)		−4.02***	−4.11***	−4.12***	−4.12***
		(0.44)	(0.41)	(0.41)	(0.43)
log(Age at election)			1.51	1.58	1.58
			(1.80)	(1.70)	(2.49)
Republican			4.11***	4.21***	4.21***
			(1.08)	(1.01)	(1.30)
Same party as House majority			0.34	0.36	0.36
			(0.27)	(0.28)	(0.38)
Same party as Senate majority			−0.38*	−0.35*	−0.35
			(0.19)	(0.19)	(0.22)
Same party as President			−0.01	−0.02	−0.02
			(0.18)	(0.19)	(0.21)
Congress FE	yes	yes	yes	yes	yes
Congressional district FE	yes	yes	yes	yes	yes
Year FE	no	yes	yes	yes	yes
2-digit NAICS FE	no	no	yes	yes	yes
2-digit product & service type FE	no	no	yes	yes	yes
Awarding agency FE	no	no	no	yes	yes
SE clustered year	yes	yes	yes	yes	yes
SE clustered 2-digit NAICS	yes	yes	yes	yes	yes
SE clustered congressional district	no	no	no	no	yes
Observations	722,940	722,940	698,751	698,751	698,751
Adjusted R^2	0.09	0.10	0.12	0.12	0.12

Table 2: Difference-in-difference regression explaining the probability of a government contract being awarded to a female entrepreneur

This table examines whether female House representatives influence the probability that a government procurement contract is awarded to a women-owned firm. Each column displays the results of a difference-in-difference specification with a dummy indicating whether a given contract is awarded to a WOB around close House of Representatives elections as dependent variable. The main independent variable is an indicator if the winning representative is female, *Female winner*, and an indicator whether the contract is awarded after the start of the incoming Congress, *after term start*. We gradually consider fixed effects for individual elections, 2-digit NAICS industries, year-month, awarding agency, and 2-digit product and service code. For each close election and the corresponding congressional district, the sample considers all competitive contracts awarded within the SBA program performed in the district betweeen the previous term start and election date (before term start) and between term start and subsequent election date (after term start). For back-to-back close elections, the period between them is split. Coefficients are reported in percentages. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Contract awarded to a women-owned business					
Female winner × after term start	5.04***	5.87***	5.94***	6.19***	6.20***	6.05***
	(1.28)	(1.40)	(1.37)	(1.59)	(1.63)	(1.55)
log(Number of employees)		0.21	0.25	0.30	0.28	0.32
		(0.30)	(0.27)	(0.28)	(0.28)	(0.30)
log(Annual revenue)		-3.28**	-3.33**	-2.95**	-2.91**	-2.93***
		(1.17)	(1.16)	(1.06)	(1.05)	(0.97)
Financial data missing, indicator		-2.40***	-2.53***	-3.84***	-3.77***	-3.96***
		(0.79)	(0.74)	(0.82)	(0.81)	(0.82)
log(Firm age)		-5.89***	-5.82***	-4.79***	-4.81***	-4.64***
		(0.68)	(0.72)	(0.53)	(0.51)	(0.39)
Year FE	yes	yes	yes	yes	yes	yes
Election FE	yes	yes	yes	yes	yes	yes
2-digit NAICS FE	no	no	yes	yes	no	no
3-digit NAICS FE	no	no	no	no	yes	yes
Awarding agency FE	no	no	no	yes	yes	no
Awarding subagency FE	no	no	no	no	no	yes
2-digit product & service type FE	no	no	no	yes	yes	no
3-digit product & service type FE	no	no	no	no	no	yes
Observations	22,295	22,295	22,295	22,295	22,295	22,295
Adjusted R^2	0.11	0.14	0.14	0.19	0.19	0.22

Table 3: Parallel trend

This table examines the existence of parallel trends around the event date. The specification as well as the sample mimics Table 2, model four. The main independent variable indicating if the winning representative is female, *Female winner*, is interacted with different half-year-long time periods before and after the election, except for the 6 months before the term start, which acts as a benchmark. Coefficients are reported in percentages. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Dependent variable: Contract awarded to a women-owned business	
Female winner $\times$ term start minus 4 half years	2.22
	(1.81)
Female winner $\times$ term start minus 3 half years	-0.52
	(1.37)
Female winner $\times$ term start minus 2 half years	-1.30
	(1.36)
Female winner $\times$ term start plus 1 half years	7.07**
	(2.67)
Female winner $\times$ term start plus 2 half years	6.60***
	(2.22)
Female winner $\times$ term start plus 3 half years	4.07*
	(2.25)
Female winner $\times$ term start plus 4 half years	5.79***
	(1.24)
Controls	yes
Year FE	yes
Election FE	yes
2-digit NAICS FE	yes
Awarding agency FE	yes
2-digit product & service type FE	yes
Observations	22,292
Adjusted R^2	0.19

Table 4: Robustness - different voting margin thresholds

This tables investigates if our main result is robust to the definition of a close election. The specification reported in this table mimics Table 2, model four. Each column presents results based on a different sample, varying the vote margin threshold that defines a close election from 10% to 1%. Given the threshold, the contract sample is constructed as described in Section 4. Coefficients are reported in percentages. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Contract awarded to a women-owned business				
Voting margin	10%	7.5%	5%	2.5%	1%
Female winner $\times$ after term start	3.94***	5.21***	6.19***	7.45**	16.55**
	(1.34)	(1.53)	(1.59)	(3.20)	(7.10)
Controls	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes
Election FE	yes	yes	yes	yes	yes
2-digit NAICS FE	yes	yes	yes	yes	yes
Awarding agency FE	yes	yes	yes	yes	yes
2-digit product & service type FE	yes	yes	yes	yes	yes
Observations	46,559	35,567	22,295	11,450	4,558
Adjusted R^2	0.19	0.17	0.19	0.23	0.26

Table 5: Persistence

This table investigates if our main result persists longer than the initial term of the female representative. The specification mimics Table 2, model four. The sample considers contracts awarded up to 48 months after the initial term starts of only close elections that are not preceded by another close election. We include two indicator variables that indicate the time after the election. *Incoming Congress* equals one in the first Congress after the election, while *Subsequent Congress* equals one for the subsequent one. While the first column uses all elections, we also limit our use to the ones in which the winner of the close election is reelected, columns two and three, and the ones in which he or she is replaced, columns four to six. In addition, we limit based on whether the winner of the first close election is the incumbent in column three, and based on the gender of the representative winning the subsequent elections in columns five and six. Coefficients are reported in percentages. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Contract awarded to a women-owned business					
	Full sample	Winner reelected		Winner not reelected		
Gender subsequent Congress	both	both	both	both	male	female
Female winner × incoming Congress	6.56***	1.67	8.41***	8.64***	7.37***	7.94**
	(1.72)	(2.14)	(2.82)	(0.99)	(1.42)	(2.80)
Female winner × subsequent Congress	8.70***	5.89*	17.14***	9.83***	19.08***	4.70**
	(1.83)	(2.85)	(5.71)	(1.15)	(1.96)	(1.97)
Exclude if winner is incumbent	no	no	yes	no	no	no
Controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Election FE	yes	yes	yes	yes	yes	yes
2-digit NAICS FE	yes	yes	yes	yes	yes	yes
Awarding agency FE	yes	yes	yes	yes	yes	yes
2-digit product & service type FE	yes	yes	yes	yes	yes	yes
Observations	33,184	10,531	8,005	22,653	8,824	13,829
Adjusted R^2	0.19	0.28	0.30	0.19	0.23	0.21

Table 6: Female presence

This table investigates if historical female presence acts as a moderator. The specification mimics Table 2, model four. The respective sample of contracts is split based on the presence of female lawmakers. Models one to six split elections in congressional districts based on female governors at the state level, female senators from the state, and female House representatives before 2004. Models seven and eight split election based on the presence of female House representatives in the last 10 years leading up to the election. Coefficients are reported in percentages. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Contract awarded to a women-owned business							
	Female governors before 2004		Female senators before 2004		Female representatives before 2004		Female representatives during last 10 years	
	None	>0	None	>0	None	>0	None	>0
Female winner × after term start	9.90**	2.62	9.69***	−0.08	6.74***	2.67	6.07***	4.05***
	(3.45)	(1.66)	(2.21)	(1.46)	(1.75)	(3.27)	(1.99)	(1.14)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes	yes	yes
Election FE	yes	yes	yes	yes	yes	yes	yes	yes
2-digit NAICS FE	yes	yes	yes	yes	yes	yes	yes	yes
Awarding agency FE	yes	yes	yes	yes	yes	yes	yes	yes
2-digit product & service type FE	yes	yes	yes	yes	yes	yes	yes	yes
Observations	13,179	9,116	11,811	10,484	17,621	4,674	11,674	10,621
Adjusted R^2	0.24	0.15	0.17	0.25	0.19	0.24	0.25	0.14

Table 7: Performance

This table examines contract performance of firms receiving government contracts after close House of Representatives elections. The dependent variables are a dummy indicating whether there was no change in contract amount and maturity, no modification, and whether the contract was completed. The main independent variable is an indicator if the winning representative is female, *Female Representative*, and an indicator whether the gender of the entrepreneur is female, *women-owned business*. The remaining controls and the sample are similar to Table 2, but only include contracts awarded after the term start of the winner of the close election. Coefficients are reported in percentages. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable			
	No increase in contract amount	No increase in contract maturity	No modification	Completed contract
Women-owned business	−1.41*	0.70	2.51	−0.45
	(0.77)	(1.93)	(1.52)	(0.36)
Female winner × women-owned business	1.82	1.18	1.43	1.16*
	(1.61)	(2.34)	(2.03)	(0.57)
Controls	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Election FE	yes	yes	yes	yes
2-digit NAICS FE	yes	yes	yes	yes
Awarding agency FE	yes	yes	yes	yes
2-digit product & service type FE	yes	yes	yes	yes
Observations	11,937	11,937	11,937	11,937

Table 8: Congressional requests by female legislators

This table investigates if congressional requests by female legislators act as an amplifier of our main effect. We interact a dummy variable turning one after the term start, *After term start*, with several indicators indicating if the legislator issued requests to the DoD and its subagencies during her term. Models one to three consider levels while model four to six consider changes relative to the previous district representative. The sample consists of contracts associated with elections won by female candidate. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Contract awarded to a women-owned business					
	Contemporaneous			Change		
After term start × Correspondence > 0	−0.15					
	(1.49)					
After term start × Correspondence regarding contracts > 0		5.51**				
		(2.50)				
After term start × Correspondence with DoD > 0			4.76***			
			(0.52)			
After term start × Δ Correspondence > 0				5.29***		
				(0.48)		
After term start × Δ Correspondence regarding contracts > 0					2.77	
					(2.84)	
After term start × Δ Correspondence with DoD > 0						11.80***
						(2.22)
Controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Election FE	yes	yes	yes	yes	yes	yes
2-digit NAICS FE	yes	yes	yes	yes	yes	yes
Awarding agency FE	yes	yes	yes	yes	yes	yes
2-digit product & service type FE	yes	yes	yes	yes	yes	yes
Observations	10,067	10,067	5,728	10,054	10,054	4,868
Adjusted R^2	0.27	0.27	0.26	0.27	0.27	0.32

Table 9: Political alignment

This table examines whether the influence of female House representatives on the probability that a government procurement contract is awarded to a WOB depends on political alignment with House of Representatives, Senate, and president. Each column displays the results of a difference-in-difference specification, with a dummy indicating whether a given contract is awarded after the term start is interacted with an indicator equaling one if the winner of the election is in the same party as the House majority or Senate majority, or the party of the president. The sample consists of contracts associated with elections won by female candidates. Coefficients are reported in percentages. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Contract awarded to a women-owned business		
After term start × same party as House majority	−12.66***		
	(2.82)		
After term start × same party as Senate majority		−7.02**	
		(3.26)	
After term start × same party as president			−10.90***
			(3.24)
Controls	yes	yes	yes
Year FE	yes	yes	yes
Election FE	yes	yes	yes
2-digit NAICS FE	yes	yes	yes
Awarding agency FE	yes	yes	yes
2-digit product & service type FE	yes	yes	yes
Observations	13,829	13,829	13,829
Adjusted R^2	0.22	0.22	0.22

Table 10: Local contractors

Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Probability of contract being				
	awarded to a WOB		executed locally		
Female winner $\times$ after term start	9.30***	0.24	2.57***	15.27***	0.86
	(1.64)	(2.41)	(0.19)	(1.47)	(1.47)
Government contractor	Local	Non-local	All	Female	Male
Controls	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes
Election FE	yes	yes	yes	yes	yes
2-digit NAICS FE	yes	yes	yes	yes	yes
Awarding agency FE	yes	yes	yes	yes	yes
2-digit product & service type FE	yes	yes	yes	yes	yes
Observations	15,616	6,679	22,295	3,895	18,400
Adjusted R^2	0.28	0.09	0.34	0.42	0.35

A   Overview Appendix

B Figures
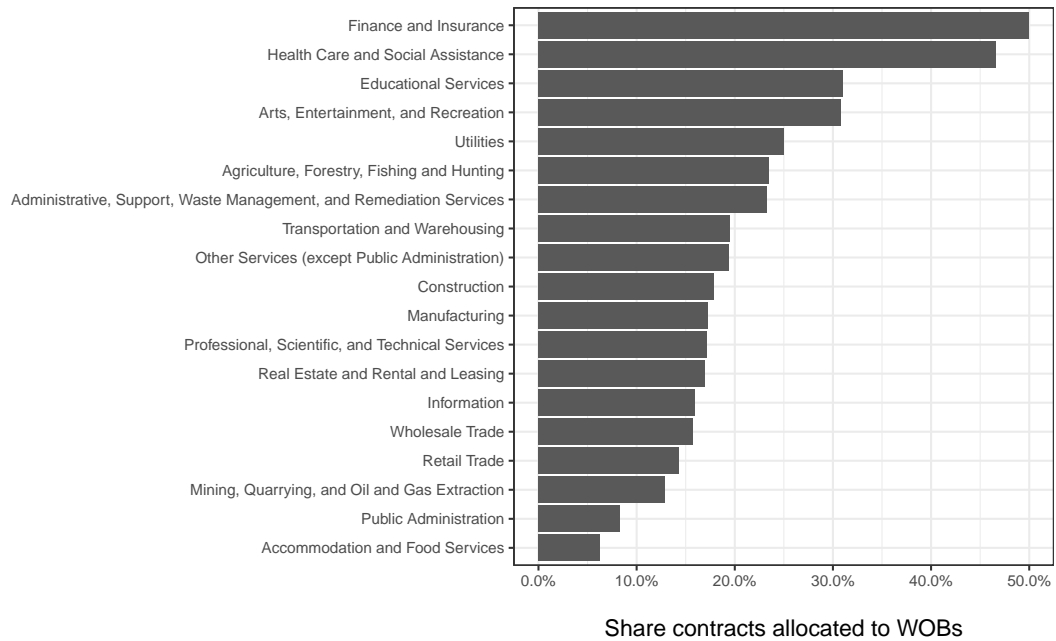
The plot displays the share of government procurement contracts allocated to WOBs across 2-digit NAICS industries. The individual industries are displayed in a decreasing order. The sample considers all competitive contracts awarded under the SBA program that we consider in our main close election sample.

Figure A1: Share of government procurement contracts allocated to WOBs across industries
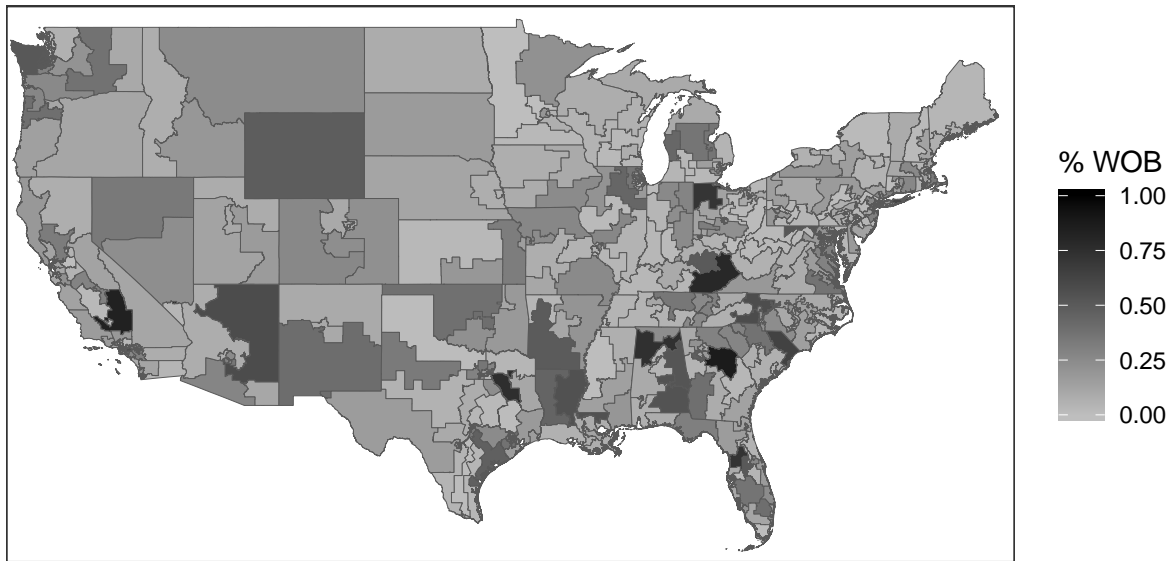
The plot displays the contract amount weighted share of government procurement contracts allocated to female entrepreneurs for each congressional district, excluding Alaska and other congressional districts that are not on mainland North America. The map displays the distribution for the 114th Congress. The sample considers all competitive contracts awarded under the SBA program.

Figure A2: Share of government procurement contracts allocated to WOBs per congressional district for the 114th Congress

C Tables

Table A1: Close elections between female and male House Representatives

For each close election in the sample, this table reports the Congress, the State, the District, and election type. For both the winner and the loser, we report their name, gender, party, and percentage of votes received in the election. The sample consists of all House of Representatives elections decided by a margin of maximum 5% in which a female candidate competed against a male one.

Congress	State	District	Type	Winner				Loser	
				Name	Gender	Party	Vote %	Name	Gender
112	AL	02	GE	Roby, Martha	F	REP	51.0%	Bright, Bobby	M
113	AZ	01	GE	Kirkpatrick, Ann	F	DEM	48.8%	Paton, Jonathan	M
113	AZ	02	GE	Barber, Ron	M	DEM	50.4%	McSally, Martha	F
114	AZ	02	GE	McSally, Martha	F	REP	50.0%	Barber, Ron	M
112	AZ	08	GE	Giffords, Gabrielle	F	DEM	48.8%	Kelly, Jesse	M
114	CA	26	GE	Brownley, Julia	F	DEM	51.3%	Gorell, Jeff	M
110	CT	04	GE	Shays, Christopher	M	REP	51.0%	Farrell, Diane	F
113	CT	05	GE	Esty, Elizabeth	F	DEM	51.3%	Roraback, Andrew	M
114	FL	02	GE	Graham, Gwen	F	DEM	50.5%	Southerland, Steve	M
115	FL	07	GE	Murphy, Stephanie	F	DEM	51.5%	Mica, John	M
113	FL	10	GE	Webster, Daniel	M	REP	51.7%	Demings, Val B.	F
110	FL	13	GE	Buchanan, Vern	M	REP	50.1%	Jennings, Christine	F
115	GA	06	SE	Handel, Karen	F	REP	51.8%	Ossoff, Jon	M
114	IA	01	GE	Blum, Rod	M	REP	51.1%	Murphy, Pat	F
110	IL	06	GE	Roskam, Peter J.	M	REP	51.4%	Duckworth, L. Tammy	F
109	IL	08	GE	Bean, Melissa	F	DEM	51.7%	Crane, Philip	M
112	IL	08	GE	Walsh, Joe	M	REP	48.5%	Bean, Melissa	F
112	IN	02	GE	Donnelly, Joe	M	DEM	48.2%	Walorski, Jackie	F
113	IN	02	GE	Walorski, Jackie	F	REP	49.0%	Mullen, Brendan	M
110	KS	02	GE	Boyda, Nancy	F	DEM	50.6%	Ryun, Jim	M
110	KY	03	GE	Yarmuth, John	M	DEM	50.6%	Northup, Anne M.	F
110	MI	07	GE	Walberg, Tim	M	REP	49.9%	Renier, Sharon Marie	F
115	MN	02	GE	Lewis, Jason	M	REP	47.0%	Craig, Angie	F
111	MN	06	GE	Bachmann, Michele	F	REP	46.4%	Tinklenberg, El	M
113	MN	06	GE	Bachmann, Michele	F	REP	50.5%	Graves, Jim	M
111	MO	09	GE	Luetkemeyer, Blaine	M	REP	50.0%	Baker, Judy	F
112	NC	02	GE	Ellmers, Renee	F	REP	49.5%	Etheridge, Bob	M
110	NH	01	GE	Shea-Porter, Carol	F	DEM	51.3%	Bradley, Jeb	M
113	NH	01	GE	Shea-Porter, Carol	F	DEM	49.8%	Guinta, Frank C.	M
114	NH	01	GE	Guinta, Frank C.	M	REP	51.7%	Shea-Porter, Carol	F
115	NH	01	GE	Shea-Porter, Carol	F	DEM	44.3%	Guinta, Frank	M
112	NH	02	GE	Bass, Charles	M	REP	48.2%	Kuster, Ann McLane	F
113	NH	02	GE	Kuster, Ann McLane	F	DEM	50.2%	Bass, Charles	M
115	NH	02	GE	Kuster, Ann McLane	F	DEM	49.7%	Lawrence, Jim	M
110	NJ	07	GE	Ferguson, Mike	M	REP	49.4%	Stender, Linda	F
110	NV	03	GE	Porter, Jon	M	REP	48.5%	Hafen, Tessa M.	F
112	NV	03	GE	Heck, Joe	M	REP	48.1%	Titus, Dina	F
115	NV	03	GE	Rosen, Jacky	F	DEM	47.2%	Tarkanian, Danny	M
113	NY	18	GE	Maloney, Sean Patrick	M	DEM	51.9%	Hayworth, Nan	F
114	NY	18	GE	Maloney, Sean Patrick	M	DEM	49.7%	Hayworth, Nan	F
110	NY	19	GE	Hall, John	M	DEM	51.2%	Kelly, Sue W.	F
112	NY	25	GE	Buerkle, Ann Marie	F	REP	50.1%	Maffei, Daniel B.	M
114	NY	25	GE	Slaughter, Louise M.	F	DEM	50.2%	Assini, Mark W.	M
109	NY	27	GE	Higgins, Brian M.	M	DEM	50.7%	Naples, Nancy A.	F
113	NY	27	GE	Collins, Chris	M	REP	50.8%	Hochul, Kathy C.	F
109	OH	02	SE	Schmidt, Jean	F	REP	51.6%	Hackett, Paul	M
111	OH	15	GE	Kilroy, Mary Jo	F	DEM	45.9%	Stivers, Steve	M
113	OH	16	GE	Renacci, Jim	M	REP	52.0%	Sutton, Betty	F
111	PA	03	GE	Dahlkemper, Kathy	F	DEM	51.2%	English, Phil	M
110	PA	04	GE	Altmire, Jason	M	DEM	51.9%	Hart, Melissa A.	F
111	SC	01	GE	Brown, Henry E., Jr.	M	REP	51.9%	Ketner, Linda	F
109	TX	17	GE	Edwards, Chet	M	DEM	51.2%	Wohlgemuth, Arlene	F
110	VA	02	GE	Drake, Thelma D.	F	REP	51.3%	Kellam, Philip J.	M
111	VA	02	GE	Nye, Glenn C., III	M	DEM	52.4%	Drake, Thelma D.	F
112	WA	08	GE	Reichert, Dave	M	REP	52.1%	DelBene, Suzan	F
110	WY	00	GE	Cubin, Barbara	F	REP	48.3%	Trauner, Gary	M

Table A2: Summary statistics - mixed-gender close elections for the House of Representatives

This table provides an overview of close elections analysed in this paper. For different subsamples of the data, we provide the number and share of all close elections and the ones won by female and male candidates, respectively. The sample consists of all House of Representatives elections decided by a margin of maximum 5% in which a female candidate competed against a male one.

	Full sample		Female winner		Male winner	
	Nr.	%	Nr.	%	Nr.	%
All close elections	56	100%	28	50%	28	50%
Democratic female	35	62%	17	49%	18	51%
Republican female	21	38%	11	52%	10	48%
Democratic winner	27	48%	17	63%	10	37%
Republican winner	29	52%	11	38%	18	62%
Male incumbent	38	68%	19	50%	19	50%
Female incumbent	18	32%	9	50%	9	50%
Party change	27	48%	11	41%	16	59%
No party change	29	52%	17	59%	12	41%
Age of winner ≤ 57	34	61%	17	50%	17	50%
Age of winner > 57	22	39%	11	50%	11	50%
Gender change	28	50%	19	68%	9	32%
No gender change	28	50%	9	32%	19	68%

Table A3: Summary statistics - government procurement contracts

This table report summary statistics for government procurement contracts. The full sample considers all government contracts awarded between January 2002 and December 2018. The first three columns provide mean, standard deviation, and number of observations for several key variables for the full sample, while columns four to six consider only the contracts associated with close elections. In addition, we provide the difference between contracts associated with close elections and the remaining ones in column seven. The associated p-value uses standard errors clustered on years and 2-digits NAICS codes.

Panel A: Full sample

	Full sample			Close elections			Difference	
	Mean	Std.Dev	Nr. Obs.	Mean	Std.Dev	Nr. Obs.	Difference	p-value
Share of WOBs (in %)	19.95	39.96	788,998	17.47	37.97	22,295	−2.55	0.00
Contract amount (kUSD)	56.39	208.44	788,998	56.23	204.31	22,295	−0.17	0.94
Maturity (in days)	140.32	405.70	788,998	127.90	269.17	22,295	−12.78	0.11
Annual revenue (mUSD)	24.71	94.12	297,992	24.12	76.31	8,747	−0.61	0.75
Number of employees	57.57	154.65	299,199	68.53	168.64	8,779	11.29	0.06
Age in years	28.79	21.53	788,998	27.48	20.76	22,295	−1.34	0.10
Share of contracts with no increase in contract amount (in %)	91.26	28.24	788,998	91.94	27.22	22,295	0.70	0.03
Share of contracts with no increase in maturity (in %)	86.09	34.60	788,996	86.22	34.47	22,295	0.13	0.86
Share of contracts with no modifications (in %)	72.76	44.52	788,998	72.13	44.84	22,295	−0.65	0.48
Share of completed contracts (in %)	97.97	14.10	788,998	98.25	13.11	22,295	0.29	0.00

Table A4: Role model effects

In this table, we investigate aggregate role model effects. The sample consist of a cross-sectional panel with each observation being a close mixed-gender election. The main independent variable is an indicator equaling one if the election was won by the female candidate. We consider following dependent variables: change in share of contracts allocated to WOBs (equally and value weighted), share of female who are self-employed and share of self-employed that are female, and implicit and explicit bias. The coefficients are in percentages. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

| | Dependent variable: | | | | | |
| | Δ %contracts to WOBs | | Δ %self-employed female | | Δ Bias against women | |
	(ew)	(vw)	(version 1)	(version 2)	(explicit)	(implicit)
Female winner	7.24*	7.98**	0.93	1.46	0.05	0.00
	(4.27)	(3.75)	(1.10)	(4.12)	(0.06)	(0.02)
Republican winner	5.34	7.79**	−0.05	−4.07	0.01	0.02
	(4.28)	(3.77)	(1.07)	(4.02)	(0.06)	(0.02)
Winner is incumbent	−0.05	0.01	0.00	0.00	0.00	−0.00***
	(0.04)	(0.04)	(0.01)	(0.04)	(0.00)	(0.00)
Age winner at the election	0.12	−0.07	0.04	−0.05	−0.00	0.00
	(0.24)	(0.21)	(0.06)	(0.22)	(0.00)	(0.00)
Congress FE	yes	yes	yes	yes	yes	yes
Observations	56	56	43	43	53	53
Adjusted R^2	0.02	0.08	-0.20	-0.07	0.72	0.16

Table A5: Network

This table investigates if networks act as an amplifier of our main effect. We interact a dummy variable equaling one after the term start, *After term start*, with several indicators indicating the network of the female legislator. In models one to four, we proxy networks by a dummy turning one if she was born in the district, had local political experience before the election, and if she is a business owner in general or in the district. The sample consists of contracts associated with elections won by female candidate. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Probability of contract being awarded to a female entrepreneur			
After term start × Born in district	−1.46**			
	(0.60)			
After term start × Local political experience		3.46		
		(2.60)		
After term start × Local business owner			−2.44***	
			(0.61)	
After term start × Business owner				1.03
				(0.81)
Controls	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Election FE	yes	yes	yes	yes
2-digit NAICS FE	yes	yes	yes	yes
Awarding agency FE	yes	yes	yes	yes
2-digit product & service type FE	yes	yes	yes	yes
Observations	13,829	13,829	13,829	13,829
Adjusted R^2	0.22	0.22	0.22	0.22

Table A6: Changes in contract terms

This table investigates if the gender of the election winner affects the terms of contracts awarded to women-owned versus other firms. We consider contract amount as well as maturity as the relevant contract terms. Models one and two consider all elections won by female candidates while models three and four consider the remaining. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Female winner		Male winner	
	Dependent variable:			
	log(USD)	log(maturity +1)	log(USD)	log(maturity +1)
Women-owned firm	−0.05	−0.18**	−0.10	0.06
	(0.07)	(0.06)	(0.07)	(0.05)
Women-owned firm × after term start	0.11	0.05	0.06	−0.01
	(0.08)	(0.09)	(0.12)	(0.06)
Controls	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Election FE	yes	yes	yes	yes
2-digit NAICS FE	yes	yes	yes	yes
Awarding agency FE	yes	yes	yes	yes
2-digit product & service type FE	yes	yes	yes	yes
Observations	13,829	13,829	8,466	8,466
Adjusted R^2	0.26	0.43	0.23	0.31

Table A7: Head of agency

This table investigates if the main result depends on the gender of the head of the agency or subagency awarding the contract. The specification mimics Table 2. The respective sample of contracts is split based on the gender of the agency head. In models one, two, five, and six, we omit controls and several fixed effects. Coefficients are reported in percentages. Standard errors are reported in parentheses and clustered at 2-digit NAICS code industries and calendar year. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Probability of contract being awarded to a female entrepreneur							
	Agency head gender				Subagency head gender			
	Female	Male	Female	Male	Female	Male	Female	Male
Female winner × after term start	15.73	6.09***	9.98	6.52***	16.34**	5.07***	13.30	6.18***
	(11.01)	(1.20)	(11.09)	(1.39)	(7.32)	(1.06)	(10.63)	(1.36)
Controls	no	no	yes	yes	no	no	yes	yes
Year FE	yes	yes	yes	yes	yes	yes	yes	yes
Election FE	yes	yes	yes	yes	yes	yes	yes	yes
2-digit NAICS FE	no	no	yes	yes	no	no	yes	yes
Awarding agency FE	no	no	yes	yes	no	no	yes	yes
2-digit product & service type FE	no	no	yes	yes	no	no	yes	yes
Observations	1,714	20,383	1,714	20,383	761	20,636	761	20,636
Adjusted R^2	0.08	0.12	0.22	0.20	0.02	0.12	0.09	0.20