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

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January 8, 2023

Motivation

- Government spending is a relevant policy tool
  - In FY 2021, government contracting amounted to 636 bn USD

- Gender gap and barriers for women-owned businesses (Beede and Rubinovitz, 2015; Bates, 2002)

- Rise in female political participation `Graph`
  - Share of women in House of Representative increases from 14% in 2001 to 27% in 2021.

- Ample evidence that female politicians take legislative actions targeted at and beneficial for female constituents (Gerrity et al., 2007; Volden et al., 2018)

$\Rightarrow$ **Do female politicians affect distribution of government spending to women-owned firms?**

Motivation

"Women are at the center of the American economy"

"Women entrepreneurs may be the country's greatest untapped economic resource"

<div align="right">

Senator Jeanne Shaheen
Democrat from New Hampshire
Former ranking member of the Committee
on Small Business and Entrepreneurship

</div>

Motivation

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Paper in a nutshell

1. **Identification challenge**
   - Use government procurement contracts to identify direct link between an individual politician and a firm.
   - Exploit close mixed-gender elections for causal inference.

2. **Main finding**
   - Female politicians increase the probability that a contract is awarded to a women-owned business by app. 2.7 percentage points.

3. **Mechanism**
   - The effect is the strongest among local contractors and persists after the female politician's departure.
   - Individual oversight through congressional requests is a likely mechanism.

4. **Costs/benefits associated with a more gender-balanced representation in government contracting**
   - Fail to find evidence of significant economic costs of WOBs procuring contracts, neither on ex-ante auction outcomes nor for most ex-post performance measures.

Related literature

- Influx of female legislators
  - Legislative activities: Swers (2001, 2005); Gerrity et al. (2007); Volden et al. (2018)
  - Ghani et al. (2014)
  - Our paper: women in politics affect economic outcomes for women in business

- Gender pairings in business
  - Labor relations & working culture: Matsa and Miller (2011); Amore et al. (2014); Tate and Yang (2015); Kunze and Miller (2017)
  - Availability of capital: Becker-Blease and Sohl (2007); Bellucci et al. (2010); Ewens and Townsend (2020); Gornall and Strebulaev (2020); Hebert (2020)
  - Our paper:
    - ★ Gender pairing across the realm of politics and business
    - ★ First evidence for a product market channel

- Political influence on contract allocation
  - Albouy (2013); Kasdin and Lin (2019); Cohen et al. (2011); Duchin and Sosyura (2012); Goldman et al. (2013); Tahoun (2014); Brogaard et al. (2021)
  - Our paper: first to investigate gender pairing of legislator and contractor as reason for political influence on contract allocation

Government contracts

- Federal Procurement Data System-Next Generation (FDPS-NG)
  Descriptive statistics

- Small business set-asides contracts:
 - 94% of WOBs are small businesses

- Limits
  - Specified terms and conditions (Definitive contracts)
  - Directly awarded to the firm
  - Awarded and performed inside the U.S.
  - Contractor is neither a government organization nor a nonprofit
  - Contractor is registered in the U.S. and not foreign owned

- Gender of the contractor as main dependent variable
  - Share of contracts to women-owned businesses (WOBs) varies along time, industry, product, and spatial dimensions

- Linking contract and close elections through district as place of performance

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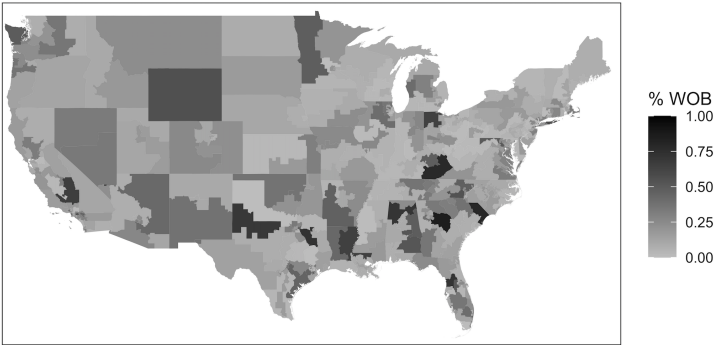
Share of government procurement contracts allocated to WOBs per congressional district for the 114th Congress

Close elections

- General and special elections to the U.S. House of Representatives

- Mixed-gender elections won by a margin ≤ 5 percentage points

- Identifying assumption: ex-post outcome of election is random

- Approach similar to Lee (2001), Akey (2015), and others

- Final sample:
    - 56 close elections Descriptive statistics
    - 50% won by women
    - 109th – 115th Congresses
    - 30,644 unique contracts Sample construction
    - Fairly equally distributed along winning party, age, incumbent gender,...

Main regression

- Difference-in-Difference
  - Outcome = contract awarded to women-owned business
  - Treatment = woman wins
  - After = after election

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

- Coefficients of interest: β_3
  - **Increase in probability, reported in percentage points, that contracts are awarded to WOBs if a woman compared to a man wins the election**

Main regression

Dependent variable: Probability of contract being awarded to a WOB				
Female winner $\times$ After term start	2.76***	2.71***	2.67***	2.67***
	(0.15)	(0.33)	(0.41)	(0.60)
Controls	no	yes	yes	yes
Year FE	yes	yes	yes	yes
Election FE	yes	yes	yes	yes
Awarding subagency FE	no	no	yes	yes
2-digit product & service code FE	no	no	yes	yes
SE clustered year	yes	yes	yes	yes
SE clustered awarding subagency	yes	yes	yes	yes
SE clustered 2-digit product & service code	no	no	no	yes
Observations	30,644	30,644	30,644	30,644
Adjusted R^2	0.08	0.08	0.13	0.13

OLS results

Economic magnitude

- Depending on specification, we find an effect of:
  - 2.7 to 2.8 percentage points

- What is the right benchmark?
  - Unconditional probability in 2018 amounts to 20.1%.
  - From 2002 to 2018, the share of contracts awarded to WOBs increased by 4.9 percentage points. `Graph`
  - Federal Acquisition Streamlining Act from 1994: 5% goal of federal contract dollars to WOBs; sequential explicit programs such as WOSB set-asides; the goal was reached only in 2015 and in 2018.

Validity and robustness

- **No discontinuity**: [Graph]
  The probability of a female candidate winning an election is smoothly distributed around the 50% vote margin threshold.

- **Covariate balance test**: [Results]
  Congressional districts won by women are similar to the districts won by men ex ante in observable characteristics.

- **Parallel trend**: [Results]
  The gender of the winning candidate does not affect the probability of government contracts being awarded to WOBs before the election.

- **No significant results for placebo events**. [Results]

- **Similar results in the RDD setting**. [Results]

- **Counties spanning multiple congressional districts**: [Results]
  The effect is present only among the parts of the counties in the district with close elections.

Mechanism

- **Local contractors**:
  The increase in contracts allocated to WOBs is the strongest among local contractors.

- **Persistence**:
  The effects of female legislators persist beyond their initial terms.

- **Individual congressional oversight**:
  The effect is larger for female legislators who actively communicate with the agencies regarding contracting.

Local contractors

	Local contractor		Non-local contractor	
Dependent variable: Probability of contract being awarded to a WOB				
Female winner × After term start	4.94***	4.04***	−0.25	1.98
	(0.13)	(1.06)	(1.76)	(1.51)
Controls	no	yes	no	yes
Year FE	yes	yes	yes	yes
Election FE	yes	yes	yes	yes
Awarding subagency FE	no	yes	no	yes
Two-digit product and service code FE	no	yes	no	yes
Observations	20,574	20,574	10,070	10,070
Adjusted R^2	0.14	0.20	0.03	0.06

Persistence

Dependent variable: Probability of contract being awarded to a WOB			
Female winner × Incoming Congress	3.39***	3.53***	3.50***
	(0.48)	(0.51)	(0.51)
Female winner × Subsequent Congress	6.95***	7.71***	3.87***
	(0.82)	(1.37)	(0.89)
Female winner × Subsequent Congress with reelected representative		−3.00	
		(4.67)	
Female winner × Subsequent Congress with male representative			3.59
			(2.49)
Controls	yes	yes	yes
Year FE	yes	yes	yes
Election FE	yes	yes	yes
Awarding subagency FE	yes	yes	yes
Two-digit product and service code FE	yes	yes	yes
Observations	45,445	45,445	45,445
Adjusted R^2	0.13	0.13	0.13

Congressional requests

- Motivation
  - ▶ Links on webpages of Representatives offering help in communication with agencies
  - ▶ Anecdote of Diana DeGette, Democrat from Colorado, contacting GSA
  - ▶ Dean Zerbe, former Counsel and Investigator for the Office of Senator Charles Grassley: *"[...] 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."*

- Using FOIA requests we construct a measure of correspondence with the DoD and some of its subagencies.
  - ▶ Recent evidence by Judge-Lord et al. (2018), Lowande et al. (2019)

- We expect the effect to be stronger for representatives that increase communication with agency

Congressional requests

Dependent variable: Probability of contract being awarded to a WOB			
After term start $\times$ Δ Correspondence > 0	0.88		
	(1.74)		
After term start $\times$ Δ Correspondence regarding contracts > 0		5.42**	
		(2.13)	
After term start $\times$ Δ Correspondence with DoD > 0			6.10***
			(1.73)
Controls	yes	yes	yes
Year FE	yes	yes	yes
Election FE	yes	yes	yes
Awarding subagency FE	yes	yes	yes
2-digit product and service code FE	yes	yes	yes
Observations	12,847	12,847	6,584
Adjusted R^2	0.20	0.20	0.21

Changes in government contractor composition

- **Firm selection**:
  The increase in gender diversity is not achieved by compromising on firm quality.

- **Contract terms**:
  Contract terms for WOBs do not become more lenient.

- **Contract performance**:
  Average contract performance is almost unaffected.

Firm selection

Panel A: All firms

	log(Sales)	log(Employees)	Paydex	Age	log(Experience$_1$+1)	log(Experience$_2$+1)
WOB	−0.90***	−0.75***	−1.12**	−1.52***	−0.01	−0.17*
	(0.11)	(0.10)	(0.48)	(0.39)	(0.13)	(0.09)
Female winner × After term start	0.24**	0.08	0.27	0.12	0.21*	0.22*
	(0.09)	(0.06)	(0.54)	(0.26)	(0.12)	(0.12)
Controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Election FE	yes	yes	yes	yes	yes	yes
Awarding subagency FE	yes	yes	yes	yes	yes	yes
Two-digit product and service type FE	yes	yes	yes	yes	yes	yes
Observations	27,150	27,156	24,134	27,506	30,644	30,644
Adjusted R^2	0.29	0.20	0.15	0.24	0.56	0.62

Panel B: Only WOBs

	log(Sales)	log(Employees)	Paydex	Age	log(Experience$_1$)	log(Experience$_2$)
Female winner × After term start	0.67**	0.28**	4.57***	1.23*	0.32	0.12
	(0.23)	(0.12)	(1.20)	(0.69)	(0.23)	(0.10)
Observations	5,362	5,363	4,521	5,436	5,699	5,699
Adjusted R^2	0.35	0.23	0.26	0.34	0.56	0.55

Contract terms

Panel A: All firms

	log($ Amount)	log(Maturity+1)	No pricing/cost terms	Multiyear contract
WOB	−0.01	−0.05	0.01	−0.02***
	(0.05)	(0.05)	(0.01)	(0.00)
Female winner × After term start	−0.05	−0.01	−0.02	−0.00
	(0.04)	(0.01)	(0.03)	(0.01)
Controls	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Election FE	yes	yes	yes	yes
Awarding subagency FE	yes	yes	yes	yes
Two-digit product and service type FE	yes	yes	yes	yes
Observations	24,130	24,130	24,130	24,130
Adjusted R²	0.23	0.36	0.79	0.15

Panel B: Only WOBs

	log($ Amount)	log(Maturity+1)	No pricing/cost terms	Multiyear contract
Female winner × After term start	−0.02	0.17*	0.00	0.00
	(0.13)	(0.09)	(0.02)	(0.02)
Observations	4,521	4,521	4,521	4,521
Adjusted R²	0.25	0.50	0.84	0.15

Contract performance

Panel A: All firms

	Cost overrun	Time overrun	log(Modification+1)	Contract canceled
WOB	0.04	−0.55*	−0.01	−0.57
	(0.57)	(0.28)	(0.01)	(0.43)
Female winner × After term start	1.60*	−1.09	−0.02	0.02
	(0.81)	(1.53)	(0.02)	(0.44)
Controls	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Election FE	yes	yes	yes	yes
Awarding subagency FE	yes	yes	yes	yes
Two-digit product and service type FE	yes	yes	yes	yes
Observations	24,130	24,130	24,130	24,130
Adjusted R^2	0.22	0.14	0.31	0.02

Panel B: Only WOBs

|	Cost overrun	Time overrun	log(Modification+1)	Contract canceled
Female winner × After term start	1.23	−1.66	0.01	−0.36
	(2.30)	(3.98)	(0.04)	(0.77)
Observations	4,521	4,521	4,521	4,521
Adjusted R^2	0.26	0.17	0.35	0.00

Alternative stories

- Role model effects (Chizema et. al., 2015; Kedia and Pareek, 2020) [Results]

- Networks (Schoenherr, 2019) [Results]

- Gender of agency and subagency heads

- Small Business Development Centers

Conclusion

- Female representatives cause an increase in government contracts allocated to women-owned firms in their district.

- The quality of firms and the contract performance do not get worse.

- Individual oversight through congressional requests is a likely mechanism.

- Female representation can act as a supplement to dedicated programs.

Share of government contracts awarded to WOBs (y-axis) vs Year (x-axis)
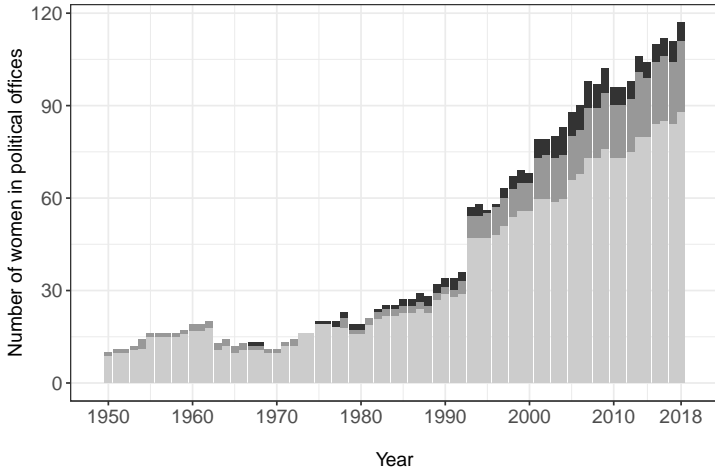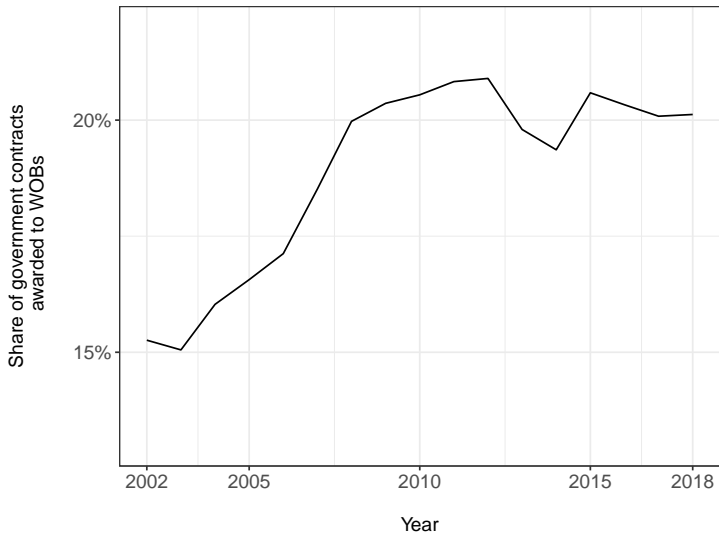
Summary statistics — government procurement contracts

back

	Full sample			Close elections			Difference	
	Mean	Std. Dev.	Nr. Obs.	Mean	Std. Dev.	Nr. Obs.	Difference	Std. Err.
WOB (in %)	19.96	39.97	1,051,916	18.60	38.91	30,644	−1.41	1.15
log(Contract amount)	9.43	1.39	1,051,916	9.52	1.29	30,644	0.09	0.03
log(Maturity (in days)+1)	4.11	1.42	1,051,916	4.00	1.41	30,644	−0.11	0.07
Contract without pricing/cost terms (in %)	26.84	44.31	1,051,916	32.38	46.80	30,644	5.71	3.22
Multiyear contract (in %)	6.95	25.42	1,051,916	6.52	24.69	30,644	−0.44	0.60
Local contractor (in %)	71.22	45.27	1,051,916	67.14	46.97	30,644	−4.20	1.95
log(Sales)				14.61	1.92	27,150		
log(Number of employees)				2.56	1.37	27,156		
Age in years				15.80	7.65	27,506		
Paydex				69.10	12.02	24,134		
log(Experience$_1$ +1)	2.12	2.01	1,051,916	2.05	2.04	30,644	−0.07	0.11
log(Experience$_2$ +1)	1.26	1.72	1,051,916	1.19	1.69	30,644	−0.08	0.08
Contract with cost overrun (in %)	9.88	29.83	1,051,913	10.31	30.41	30,644	0.45	0.48
Contract with time overrun (in %)	14.16	34.86	1,051,913	14.25	34.96	30,644	0.09	0.64
log(Number of modifications +1)	0.28	0.51	1,051,916	0.29	0.52	30,644	0.01	0.01
Canceled contracts (in %)	2.17	14.58	1,051,916	1.96	13.87	30,644	−0.22	0.13

Summary statistics — mixed-gender close elections for the House of Representatives

|	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 $\leq$ 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%
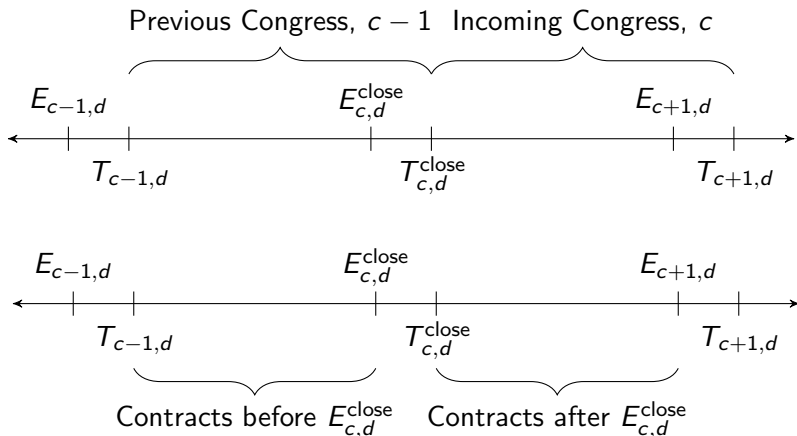
Figure: **Visualization of sample construction**

OLS regression

Dependent variable: Probability of contract being awarded to a WOB					
Female representative	2.29***	3.01***	2.81***	2.81***	2.81**
	(0.51)	(0.85)	(0.78)	(0.84)	(1.20)
Controls	no	yes	yes	yes	yes
Congress FE	yes	yes	yes	yes	yes
Congressional district FE	yes	yes	yes	yes	yes
Year FE	no	no	yes	yes	yes
Two-digit product and service code FE	no	no	yes	yes	yes
Awarding subagency FE	no	no	yes	yes	yes
SE clustered year	yes	yes	yes	yes	yes
SE clustered awarding subagency	yes	yes	yes	yes	yes
SE clustered two-digit product and service code	no	no	no	yes	yes
SE clustered congressional district	no	no	no	no	yes
Observations	955,819	919,496	919,496	919,496	919,496
Adjusted R^2	0.06	0.07	0.08	0.08	0.08

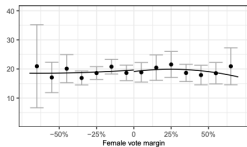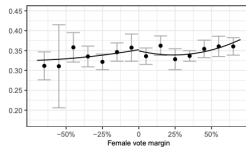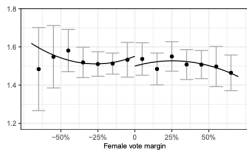# No discontinuity
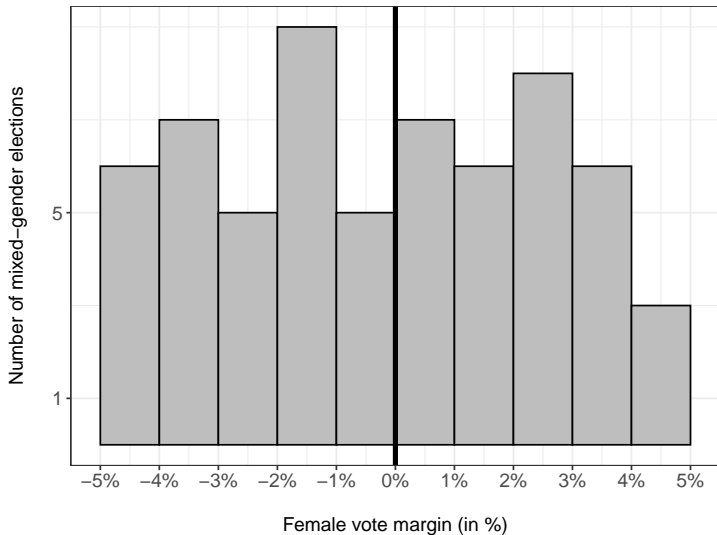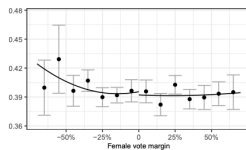
Covariate balance test
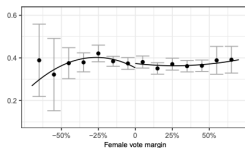
(a) Share of contracts awarded to WOBs

(b) Share of small businesses owned by women in district

(c) Explicit bias against women in district

(d) Implicit bias against women in district

(e) Share of contributions by women given to female candidate

Parallel trend

Dependent variable: Probability of contract being awarded to a WOB	
Female winner × Quarter $t-4$	−0.67
	(1.25)
Female winner × Quarter $t-3$	−0.20
	(2.94)
Female winner × Quarter $t-2$	1.77
	(2.09)
Female winner × Quarter $t-1$	2.02
	(3.89)
Female winner × After term start	3.33**
	(1.40)
Controls	yes
Year FE	yes
Election FE	yes
Awarding agency FE	yes
2-digit product and service code FE	yes
Observations	30,644
Adjusted R^2	0.15

Placebo

back

	Dependent variable: Probability of contract being awarded to a WOB		
	Same-gender elections with vote margin ≤5 pps	Close mixed-gender elections shifted forward	Close mixed-gender elections shifted back
Female winner × After term start	0.73 (1.31)	0.71 (0.91)	1.93 (2.53)
Controls	yes	yes	yes
Year FE	yes	yes	yes
Election FE	yes	yes	yes
Awarding subagency FE	yes	yes	yes
Two-digit product and service code FE	yes	yes	yes
Observations	70,879	32,464	26,551
Adjusted R^2	0.09	0.12	0.17

RDD estimate

Dependent variable: Probability of contract being awarded to a WOB		
Female winner × After term start	3.50***	4.74***
	(0.72)	(0.74)
Vote margin × After term start	−0.12**	−0.27***
	(0.04)	(0.09)
Vote margin^2 × After term start		−0.00
		(0.00)
Female winner × Vote margin × After term start	0.12*	0.30**
	(0.07)	(0.13)
Female winner × Vote margin^2 × After term start		0.00
		(0.00)
Controls	yes	yes
Year FE	yes	yes
Election FE	yes	yes
Awarding subagency FE	yes	yes
Two-digit product and service code FE	yes	yes
Observations	355,667	355,667
Adjusted R^2	0.10	0.10

Counties spanning multiple congressional districts
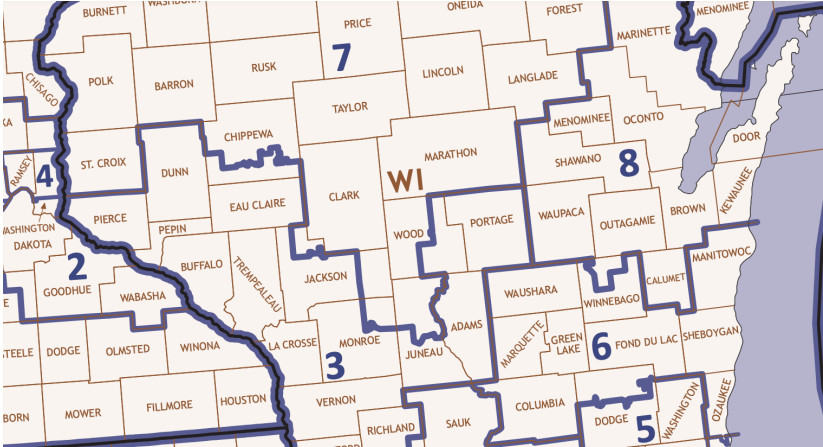
Counties spanning multiple congressional districts

Dependent variable: Probability of contract being awarded to a WOB		
	Affected	Not affected
Female winner $\times$ After term start	3.73***	1.56
	(0.73)	(1.17)
Controls	yes	yes
Year FE	yes	yes
Election FE	yes	yes
Awarding subagency FE	yes	yes
Two-digit product and service code FE	yes	yes
Observations	20,372	30,156
Adjusted R^2	0.13	0.10

Number of bids

Dependent variable: log(Number of bids)		
Female winner × After term start	0.01	−0.00
	(0.03)	(0.03)
Female winner × WOB		−0.02
		(0.06)
After term start × WOB		−0.02
		(0.05)
Female winner × After term start × WOB		0.04
		(0.09)
Controls	yes	yes
Year FE	yes	yes
Election FE	yes	yes
Awarding subagency FE	yes	yes
Two-digit product and service code FE	yes	yes
Observations	29,865	29,865
Adjusted R^2	0.27	0.27

Networks

	Dependent variable: Probability of contract being awarded to a WOB					
After term start × Born in district	−0.34 (1.97)					
After term start × Family		−9.11*** (2.89)				
After term start × High-school			−2.72* (1.54)			
After term start × Post-graduate				−3.31 (1.94)		
After term start × Local business owner					−5.79*** (1.12)	
After term start × Business owner						0.64 (1.42)
Controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Election FE	yes	yes	yes	yes	yes	yes
Awarding subagency FE	yes	yes	yes	yes	yes	yes
2-digit product & service code FE	yes	yes	yes	yes	yes	yes
Observations	18,668	18,668	18,668	18,668	18,668	18,668
Adjusted R^2	0.15	0.15	0.15	0.15	0.15	0.15