European Journal of Political Economy 79 (2023) 102404

Contents lists available at ScienceDirect

European Journal of Political Economy

journal homepage: www.elsevier.com/locate/ejpe

Gender differences in politician persistence and incumbency advantage

Mélyne Nzabonimpa

University of British Columbia, Canada

ARTICLE INFO

Keywords:
Local politics
Gender economics
Canadian municipal elections
Canada
Incumbency
Politician persistence

ABSTRACT

I analyze the difference in the persistence of men and women after an electoral loss and in their incumbency advantage, using data from the Canadian Municipal Elections Database. I find strong deterrence and incumbency effects among both men and women, but no evidence of a significant gender heterogeneity. Men are 14.9 to 16.6 percentage points less likely to re-enter politics after an electoral loss, while women are 11.8 to 14.3 percentage points less likely to do so. Moreover, incumbent male candidates are 5.8 percentage points more likely to win the next election, while female candidates are 5.6 percentage points more likely to win again. The findings have important implications for program and policy development at the municipal and provincial levels, and assist in the understanding of the roles played by political and electoral institutions in shaping elections' outcomes.

1. Introduction

As of January 2020, women constituted only 36% of elected members in local deliberative bodies (UN Women, 2021). Empirical evidence shows that female representation among elected officials matters for different reasons. For instance, Duflo (2012) argues that there is a relationship between economic development and women's political participation. Female leadership increases adolescents' aspirations and educational outcomes of teenage girls in India (Beaman et al., 2012). It also results in policies that better align with women's preferences (Chattopadhyay and Duflo, 2004), and increases the share of women candidates running in the next election (Bhalotra et al., 2017). Further, women's political participation improves economic performance (Bhalotra et al., 2018) and reduces corruption (Dollar et al., 2001). Specifically at the local level, female representation leads to increased positive performance of other female council candidates in the same and neighboring municipalities (Baskaran and Hessami, 2018), as well as increased participation of female candidates in national elections in subsequent electoral cycles (Brown et al., 2022). It also contributes to reducing the stigma around work-family conciliation by encouraging more frequent discussions on childcare during council meetings in Bavaria, and it fosters an environment where female councillors feel like they can speak up more often (Hessami and Baskaran, 2019). Hessami and da Fonseca (2020) provide a very comprehensive literature review on the substantive effects of female political representation on public policy.

These results suggest that understanding the causes of low female representation in politics would have important implications for various spheres of society. Existing literature offers potential explanations: gender gaps in political ambitions and access to campaign funding, voter bias against women, differential expectations for male and female candidates, institutional barriers (i.e., proportional vs. majoritarian electoral systems), as well as political parties' treatment and recruitment of candidates (Lawless and Fox, 2013; Pearson and McGhee, 2013; Burrell, 1992; Beaman et al., 2009; Carter, 1956; Bauer, 2020; Profeta and Woodhouse, 2022). A healthy relationship and family life may prove incompatible with public office: Fiva and King (2022) present evidence that women

E-mail address: melynenz@gmail.com.

https://doi.org/10.1016/j.ejpoleco.2023.102404
Received 10 October 2022; Received in revised form 12 May 2023; Accepted 16 May 2023
Available online 26 May 2023

experience significant child penalties (their probability of winning a seat in a subsequent election falls almost twice as much than men's) and find that women who retire do so due to preferences or perceived gender norms, while Folke and Rickne (2020) show that being elected to a mayoral or parliamentarian position increases the probability of divorce among women, but not among men. Previous research also finds a significant gender gap in violence suffered by high-profile Swedish politicians, with female mayors experiencing far more violence than any other politician (Håkansson, 2021). Murray (2014) argues that the over-representation of male politicians limits the effective representation of men and women and can have a detrimental effect on the quality of the representation. In contrast, Muyters et al. (2022) find that politicians career duration depends on their electoral performance, but that effect is only significant for men. Beaman et al. (2012) find that the gender gap in aspirations and educational attainment starts shrinking only during the second electoral mandate held by a woman, suggesting that cultivating a persevering spirit among women candidates is an important consideration.

In this paper, I study two determinants of Canadian municipal election outcomes: incumbency and persistence. I investigate the difference in the size of the male and female candidates' incumbency advantage and examine the magnitude of the differential attrition between men and women after an electoral loss by exploiting a close elections regression discontinuity design. Findings in the existing literature are mixed in this regard: some evidence from the United States points to the absence of a gender gap in candidates' response to an electoral loss, while a separate study of the United States and results from France and Germany indicate some level of a gendered re-contesting gap (incumbents and non-incumbents). Using data from the Canadian Municipal Elections Database (CMED), which contains complete municipal election results between 1867–2021 for nearly 2,000 municipalities across Canada, I find significant positive effects on subsequent political participation and success among incumbent candidates and significant negative effects on subsequent re-entry into politics after an electoral loss. More specifically, among men, candidates who barely win (near winners) are estimated to be 6.8 percentage points more likely to re-enter in the next election, and 5.8 percentage points more likely to win the next election, compared to candidates who barely lost (near losers). After a loss, near losers are estimated to be 14.9 to 16.6 percentage points less likely to re-enter politics compared to near winners. Smaller magnitudes are found among women: near winners are estimated to be 6.9 percentage points more likely to re-enter in the next election and 5.6 percentage points more likely win the next election than near losers; while the latter are 11.8 to 14.3 percentage points less likely to re-enter politics compared to near winners. However, further analysis allows me to conclude that there is no significant heterogeneity in male and female candidates for any of the outcomes of interest—consistent with results from Baskaran and Hessami (2022), Bernhard and de Benedictis-Kessner (2021) and Peveri and Sangnier (2021). The advantage of this empirical design lies in the possible uncertainty of the final vote count. Lee (2008) argues that within a small margin of victory, it is plausible that there is at least some random chance element to the vote share—nearly randomizing the outcome (win or loss) of an election and the identity of those close winners and losers. As such, I can identify the causal effect of winning (losing) a race, relative to losing (winning), on downstream outcomes. Analyzing persistence and incumbency advantage separately allows me to observe cross-gender differences in re-contesting decisions from both sides of the same coin, and for different horizons in time. In the first analysis, re-entry is defined as a candidate's participation in the immediate next election, whereas it is defined as whether a candidate will run again in any election within the next two available opportunities in the second analysis. Any differences between the short- and medium-term impact of electoral outcomes on subsequent political participation could have implications for how policy to stimulate and encourage female participation is developed.

Previous literature has documented significant gender differences in such behavior in various competitive settings.[1] In the political arena, one strand of literature focuses on exploring whether differences in political persistence of men and women after an electoral attempt is a potential determinant of eventual office-holding and political representation. Cipullo (2021) finds that female candidates are less likely to be elected to the U.S House of Representatives and less likely to become mayor in Italian cities than their males colleagues. Baskaran and Hessami (2022), using data from local council elections in Hesse, show that women are less likely to re-contest than men in the next election, with a gender gap of 5 percentage points, and attribute it to an incompatibility between family obligations and local politics. Bernhard and de Benedictis-Kessner (2021) find no significant difference in the probability of candidates to quit U.S. state and local politics after they narrowly lost an election. Contrastingly, Wasserman (2021) explores differences in the persistence of politicians in local office in California and finds a significant gender differential of 10 percentage points. Wasserman discusses potential mechanisms that may explain why the magnitude of the effect would be different for women than it is for men: gender differences in the cost or benefit of running again. It is not expected that the benefit of holding office again differs because winning candidates have the same job description, but she considers three types of costs: campaigning costs, opportunity costs and psychic costs. Casas-Arce and Saiz (2015) argue that if fundraising opportunities or political networks operate differently for women relative to men after an electoral loss, then female candidates could suffer an additional financial or time cost associated with running again. Further, if women who lose have a more attractive outside option relative to men who lose, then these gender differences could explain women's withdrawal from politics. Finally, psychic costs manifest themselves through a well-documented fact that women are more likely to opt out of competitive settings after a loss, as mentioned above.

[1] Ellison and Swanson (2018) have examined the gender gap among high-achieving math students from a dynamic perspective using data from the American Mathematics Competitions. Their evidence shows that boys and girls are more likely to drop out of participating in future years if they score just below the cut-off, and that the tendency to drop out after experiencing disappointment is more common among girls. Similarly, Buser and Yuan (2019), drawing from field data from the Dutch Math Olympiad, find that girls who do not make the cut-off are substantially less likely to participate again a year later, while there is no effect for boys. In other competitive settings, Hogarth et al. (2012) use the setting of a TV game show to test general knowledge and show that women earn 40 percent less than men and exit the game prematurely at a faster rate.

Another strand of literature centers around incumbency advantage, which is a pillar of political science models. When the vast majority of incumbents are men, female candidates can be at a disadvantage because they must challenge and win against male candidates to hold office (Schwindt-Bayer, 2005). Kendall and Rekkas (2012) provide evidence of incumbency advantage in the Canadian parliament, on the basis of increased vote shares and probability of winning. At the local level, Lucas (2021) focuses on four Canadian cities (Calgary, Edmonton, Vancouver, and Winnipeg) and finds that the unconditional incumbency advantage is very large—an elected official is 30 percentage points more likely to run in and win the next election than runners-up in the initial election. The unconditional incumbency effect is defined as the effect of incumbency unconditional on running, as opposed a conditional measure, which introduces a potential bias created by focusing only on those who choose to run. I employ the former metric. Outside of Canada, Baskaran et al. (2022) find that male candidates' incumbency advantage is significantly smaller than that enjoyed by female candidates when uncertainty is high. Lippmann (2023) shows that the incumbency advantage does not seem to prevent female candidates to access mayoral positions in France.

With respect to the gender gap, Brown et al. (2019) find that female state politicians in the US have a higher probability of re-running for the same seat in the subsequent election compared to male politicians, which in turns generates high incumbency rates for them. Smrek (2020) finds no significant differences in the incumbency advantages by male and female legislators in the Czech Republic. Sevi (2022) examines whether there are gender differences in the incumbency advantage. Using different outcomes of interest in Canadian federal politics such as probability of running again, probability of winning in the next election, and vote share, she documents a positive effect on the probability of running again, but no significant effects on the probability of winning again and candidates' vote shares in the next election. Further, she finds no statistically significant difference in the effects for male and female candidates, suggesting that women are equally likely to persist as men. Sevi notes that opposing strands of literature could explain either outcome. From one perspective, a theoretical model that only incorporates voter discrimination will predict that women win at a lower rate than men (Ashworth et al., 2020). On the other hand, if anticipated voter bias led women to self-select out of politics, then only the most qualified female candidates actually participate in electoral races (Anzia and Berry, 2011), leading to no difference in incumbency advantage between men and women. A final closely related paper is by Peveri and Sangnier (2021), who study differences across genders in the re-contesting decisions of candidates in the 2008 and 2014 municipal elections in French cities. They show that female candidates are slightly less likely to re-contest than their male counterparts, but find no significant difference in the subsequent electoral success enjoyed by male and female incumbent candidates.

To my knowledge, this would be the first empirical analysis of a gendered incumbency effect and of female candidates' response to an electoral loss at the municipal level in Canada. The main contribution of this paper is to deliver a new result on an issue about which the existing literature currently presents contrasting pieces of evidence. Canadian municipal elections offer a unique setting to examine the political situation of women: relatively high electoral turnover, the use of a ward system in most municipalities, the relative absence of political parties at the local level (in contrast to their influence in the United States and Germany, for example), smaller size of Canadian cities relative to those in other countries (Tolley, 2011). It differs specifically from the United States in that political recruitment processes are different, which provides less incentive for legislators to use local public offices as a launch-pad to higher office (Schlesinger and Schlesinger, 1966). Two factors would suggest that the magnitude of deterrence effects would be different in Canada. Women's organizations are most active in larger cities and can assist in mobilization efforts in a greater capacity and women who seek municipal office in larger cities will face more competition from men –a bigger city implies a bigger budget, which is in turn associated with more power and prestige (Gidengil and Vengroff, 1997). Further, women's professional opportunities vary across political parties (Sanbonmatsu, 2002) which, conversely, suggests that the magnitude of deterrence and incumbency effects would be smaller in the Canadian context. I further introduce a number of extensions where I explore the effects analyzed in this paper across different districts' characteristics and elections' institutional context.

The extensive coverage offered by the dataset allows me to explore heterogeneity across provinces within Canada. Municipalities in Canada share a number of characteristics, while also enjoying some distinctive features. With the exception of the Vancouver region in British Columbia, Quebec is the only province where official municipal political parties (MPP) are existent (Chiasson and Mévellec, 2014). Mévellec and Tremblay (2013) argue that there is still a lot to learn about the effects of MPP's being authorized. Bherer and Breux (2011) argue that political parties introduce candidates that offer better representation of their constituencies (by encouraging women and candidates from ethnic communities). In one study of territorial legislatures, White (2013) observes that women make up a higher proportion of MPs in settings with political parties than those without. Consequently, their involvement in political life may alter the relevance of campaigning costs for women in Québec, relative to other provinces and has the potential to explain heterogeneous variation in women across Canada. Further, Gidengil and Vengroff (1997) note that the role of women in politics underwent significant changes towards the end of the last century. The presence of strong women's groups and programs to promote equity are the most notable factors. The women's movement in Quebec is unlike the rest of Canada. Organized almost entirely in French, contrary to the rest of English Canada, its agenda focuses primarily on provincial institutional reform, whereas the Anglo-Canadian movement operates primarily at the national level (Maillé, 2015). The closer proximity between the municipal and provincial levels of government favors greater involvement of the latter into local affairs. For instance, in 1999, the Quebec provincial government implemented the program *Decision-making: A Matter of Equality*, whose aim is to increase the number of women in decision-making positions and at the center of local and regional places of power (Tremblay, 2014). As such, I expect women in Quebec to experience lesser deterrence effects and greater incumbency advantage. Consistent with this view, Muriaas et al. (2022) find that top-down gendered electoral financing initiatives are indeed successful in improving gender balance in legislatures.

2. Background

2.1. Municipal governments in Canada

Local politics differ from provincial and federal levels of government in a few regards. Municipal politics are viewed as depoliticized (Chiasson and Mévellec, 2014), in part evidenced by the absence of political parties or statements of ideological views: rather, officials get elected based on their local reputation—not their political platform. Canadian municipalities share a number of characteristics, while also possessing specific features that differentiate them from one other. Municipalities are governed by provincial governments and their areas of responsibilities include urban planning, basic infrastructure (roads, public transit, transportation), property services (water supply, sewage, garbage collection systems), public health, police and fire protection, ambulances, and housing. They also play a role in the provisions of social services, the maintenance of public parks, as well as other community aspects such as recreation, culture, and libraries. Municipalities will also empower other local bodies to govern on their behalf with regards to specific issues (e.g. local park boards). Historically, municipalities have delegated the responsibility of education to a separate entity, school boards, which are concerned with a variety of issues such as school curriculum, personnel, salary negotiations, school planning, student achievement, special education, and providing facilities and supplies (The Canadian Encyclopedia, 2022). As such, Canadian local elections include electoral races for mayoral and municipal council positions, school board trustees in a few provinces (British Columbia, Ontario, Nova Scotia), Islands Trust councillors (a special purpose government serving islands in the Salish Sea), park boards commissioners, and regional district boards in British Columbia. Although compensation for those positions varies greatly across municipalities, payment for services is typically authorized by provincial legislation and the details of it are decided by councillors or school board trustees and formalized through the passing of a by-law (or a vote, in the case of school boards).

Councils are presided over by the mayor, who is considered the chief executive officer of the locality. In some provinces, the mayor has a (limited) range of veto power in council decisions, from the right to return decisions to council with objections to absolute veto. Otherwise, the mayor has few formal powers defined by statute and is only afforded a single vote (Crawford, 1954). As Lightbody (2006) remarks, the position of the presiding officer requires a careful balancing act between advancing significant policy (in partnership with the city's chief administrative officer – a government employee – to achieve maximum impact) and building coalition to secure voting majority. Another relevant skill of the mayor is their ability to provide stability by consistently winning critical policy votes, at a level of government where the power to call snap elections is not applicable.

The municipal level of government is often considered as a more accessible point of entry into politics. Low campaign costs, smaller financial hurdles, the absence of nomination contests, lesser travel requirements, and lower levels of competition for seats are some of the barriers that have been found to be of less importance at the municipal level. Combined with the view that women are more interested in the issues addressed by municipalities and the greater compatibility of the demands of the office with their roles as wives and mothers, there is a widespread perception that the third level of government is more attainable to women (Tolley, 2011). While there has been significant improvement in overall women's representation during the 1985–1995 period, the progress made in a handful of major Canadian cities tends to distort the bigger picture and contributes to the notion that local government is more accessible to women. In fact, Gidengil and Vengroff (1997) find that many councils have either no women or only a symbolic female presence. Moreover, Tolley (2011) finds that female representation at all three levels of government in Canada is nearly equivalent but does not exceed 25% at any level. It is relevant to note that there are no official gender quotas in Canada (although the New Democratic Party and the Liberal Party at the federal level do have soft targets in place) (Maillé, 2015).

The municipal landscape in Canada is unique in a few aspects. The relative absence of political parties at the local level and the smaller size of Canadian cities relative to those in other countries make the situation of women in the Canadian municipal politics setting somewhat singular. Further, the different political recruitment process provides less incentive for legislators to use local public offices as a launch-pad to higher office, compared to the United States (Tolley, 2011). The use of the ward system in most municipalities and Canada's relatively high electoral turnover arguably affect the success rates of non incumbents, by making it easier for new candidates to break into a ward system than into an at-large system when population size is smaller and campaign costs are lower (Kushner et al., 1997), and by favoring newcomers who will contest the open seats (Matland and Studlar, 2004; Moncrief, 1998). Finally, it is worth noting that the first women candidates were only permitted to run for federal office in 1921, and correspondingly, women first appear in the sample in 1917, in Winnipeg, after Manitoba becomes the first Canadian province to extend the franchise to female voters (Status of Women Canada, 2018). Still, women are underrepresented in this sample even in recent years, with their proportion reaching a maximum of 35.3% in 2011 (Fig. A.1).

2.2. Elections

Canadian municipal elections are conducted according to a plurality system, which means the candidates who receive the most number of votes win. Municipalities can operate under one of two systems: at-large or ward system. Under the at-large electoral system (also known as the general vote), voters choose city councillors and the mayor from a list of registered candidates and can vote for as many candidates as there are seats available—the number of candidates that get the most votes are elected to the municipal council. Differently, under a ward system, the municipality is divided into smaller electoral districts (wards) and citizens vote for candidates that are registered in their own voting area—comparable to federal ridings. The format is determined by provincial statute or by the municipal council, and sometimes subject to the approval of the electors in that case. For instance, elections in the city of Vancouver are held at-large, while Toronto is currently divided into 44 wards. Term length, also set in

Table 1
Summary statistics.

	All candidates			Novice candidates		
	All	Men	Women	All	Men	Women
Female	25.51			28.69		
Panel A: Electoral outcomes						
Elected at time t	50.07	49.35	52.16	43.03	41.42	47.05
Run again at t+1	23.41	23.99	21.72	20.27	20.74	19.12
Run again and win at t+1	9.88	10.20	8.94	7.35	7.51	6.96
Run again within t+2	28.63	29.74	25.40	24.03	24.91	21.85
Panel B: Office type						
Mayor	17.03	18.47	12.82	13.22	14.42	10.26
Municipal council	80.42	79.55	82.97	83.41	82.87	84.76
Other	2.55	1.98	4.21	3.36	2.71	4.98
Unique Races	22,475	20,713	9,707	16,955	13,280	5,898
Observations	44,837	33,398	11,439	22,587	16,106	6,481

Note: This table presents summary statistics for the full sample of marginal candidates, both all and novice candidates, for Canadian local elections between 1867 and 2021. A marginal candidate is defined as the last winner or the first runner-up in an election. I define political participation and success at $t+1$ as whether an individual decides to run again in the immediate next election and whether they win, respectively. Similarly, political participation within $t+2$ is defined as whether an individual runs again in any election within the next two available opportunities after their first appearance in the dataset.

provincial legislation, differs considerably across the country and across time periods, varying from one year to four years. In recent years, elected officials serve for a three- or four-year term in all provinces. Moreover, there are no term limits in Canadian (local, provincial, and federal) politics.

Eligibility requirements include that the candidate be a Canadian citizen and have attained legal majority. Generally, they should also be a resident of the municipality or the electoral district they are competing in. Nomination procedures across provinces further establish that aspiring candidates must be endorsed by a minimum of 2 (Saskatchewan, Northwest Territories) to 100 (Québec) registered electors from the election area where the person is seeking election and may require them to pay a (typically refundable) nomination deposit when submitting their nomination documents.

On the day of the elections, electors vote by ballot. The form of the ballot is determined by provincial statute, but a common characteristic is that candidates are ordered alphabetically by surname. Lightbody (2006) notes that this feature, combined with the nonpartisan nature of local elections, gives an unfair edge to those at the top of the list, as voters work down the list to look for familiar names.

3. Methodology

3.1. Data

The main data source for this paper is the Canadian Municipal Elections Database (CMED), which contains complete election results for municipalities across Canada. The CMED is the most comprehensive database of municipal election results ever constructed in Canada and was put together by Professor Jack Lucas (Lucas et al., 2020), from the University of Calgary. Datasets for Manitoba, New Brunswick, Newfoundland and Labrador, Ontario, Alberta, British Columbia, and Quebec were available at the provincial level but in Nova Scotia, Saskatchewan, the Yukon, and the Northwest Territories, election data was available via individual municipal websites. In all cases, except when data was available for download, it was coded manually. Additionally, in cases where gender data was unavailable in the database of respective provinces and cities, it was manually coded using photographs, along with candidate self-descriptions and pronoun use found online. A distinct ID code for each unique election race was also generated. Additional information on party affiliation, candidate incumbency, or election type was manually digitized from the official paper records for the cities of Calgary, Edmonton, Montréal, Toronto, Vancouver, and Winnipeg.

The dataset has information on the name, gender, party affiliation (when available), position contested, election year, ward, votes obtained by every candidate, whether they won (and whether the seat was actually contested), total votes, province, and source of the data. One shortcoming of this dataset is the difficulty in distinctively identifying candidates. I create a unique ID identifier which allows me to follow candidates with a given full name within one municipality across the years. A candidate is defined as a novice if it is the first time they are observed in the data. Between 1867–2021, there are more than 24,000 unique elections across nearly 2,000 municipalities. Of these, 5,083 are close elections, defined as elections with a victory margin of less than 5% between the last winner and first runner-up. Nearly 90% of the elections in the dataset are in the period from 2000 to 2020, which lends present-day credibility to the upcoming results.

3.2. Descriptive statistics

Table 1 shows summary statistics for all and novice candidates who are marginal candidates—defined as candidates who are either the last winner or the first runner-up in the electoral race. Women constitute between 25 and 29% of the sample and are almost equally likely to be elected as men. In the sample of all candidates, 25% of women run again within the next 2 available opportunities and 28% run again in the immediate next election, out of which only 9% win. Considering the statistics separately for men and women allows the reader to see that there is an apparent difference between men and women's propensities to participate again in politics. For both all and novice candidates, a higher fraction of women are elected, however fewer women will make the decision to run again. For those candidates who do decide to run again in the immediate next election, similar fractions of men and women win. The variation is seemingly not driven by the type of office that women hold relative to men—women are less likely to hold mayoral positions, but the great majority of candidates (from 80% to 83%) hold positions in municipal councils, where men and women participate fairly equally.

3.3. Empirical strategy

3.3.1. Econometric framework

Following Wasserman (2021) and Lucas (2021), this research's objective is twofold. First, it is to estimate the persistence of political candidates in response to an electoral loss and the size of municipal incumbency advantage following an electoral victory, and second, in both cases, observe whether the effects are different among male and female candidates. However, a challenge arises from the fact that candidates are not randomly selected into treatment (being elected, or not)—there might be unobservable candidate characteristics, that are correlated with the share of votes received and consequently, with electoral outcomes. As such, using the OLS method for causal inference, which would simply compare the outcomes of interest of winning and losing, would introduce omitted variable bias, and produce erroneous estimates. The regression discontinuity design takes advantage of existing rules in determining treatment, and treats the selection into treatment of those who just barely qualify and those who barely fail to qualify as good as random. In essence, in the present setting, within a reasonably small neighborhood around a margin of victory (or defeat) of 0 (i.e., close elections), comparing the outcomes of candidates on either side of the discontinuity is credible because of the assumption that there is a sufficient chance element to the vote share, which randomizes the vote share, which randomizes the outcome (win or loss) of an election and the identity of those close winners and losers (Lee, 2008).[2]

Since multi-member contests are prevalent, I limit the races to those in which the number of candidates exceeds the number of open seats and focus on the margin of victory, or defeat, between candidates who are marginally elected (last winner) and the first runner-up. This procedure is suitable for both at-large and ward elections since the data records a distinct ID code for each race – defined as each distinct competition for the same seat or seats – and the observed magnitude of the specific race. Pooling electoral races across different positions or electoral rules may seem unproductive, yet it provides a comprehensive analysis of potential sources of female under-representation at the municipal level and tries to fill in some gaps in the Canadian municipal politics literature. In the absence of good electoral data, previous research on municipal representation had largely focused on representation in city councils—painting an incomplete depiction of the situation. In that regard, the wide coverage offered by the CMED is an advantage. Naturally, I also explore heterogeneity in effects across the political office sought, the type of electoral rule, and the intensity of competition among candidates to understand the interaction between elections' institutional context and candidates' outcomes.

In the differential incumbency advantage setting (short-term impact), I define the running variable as the margin of victory of candidate i in municipality m competing for political office p in election year t, $MV_{imp,t}$. For winning candidates, it is the difference in the share of votes obtained by the last winner and the first runner-up and for losing candidates it is the difference in the share of votes obtained by the first runner-up and the winner.

In the differential persistence setting (medium-term impact), I define the running variable as the margin of defeat of candidate i in municipality m in election year t, $MD_{im,t}$. For winning candidates, it is the difference in the share of votes obtained by the first runner-up and the winner and for losing candidates, it is the difference in the share of votes obtained by the last winner and the first runner-up.

Thus, the winning candidate will have a positive margin of victory (negative margin of defeat), while the losing candidates will have a negative margin of victory (positive margin of defeat). Accordingly, $MV = -MD = Margin$. The effect of winning or losing an election on a given outcome is given by:

$$\tau = \lim_{Margin_{i,t} \to 0} E[Y_{i,t+k} | Margin_{i,t}] - \lim_{0 \leftarrow Margin_{i,t}} E[Y_{i,t+k} | Margin_{i,t}] \quad (1)$$

The treatment effect can be further specified for men and women (F_i=0 or F_i=1, where F_i is an indicator taking on a value of one if the candidate is female and zero if the candidate is male). If the treatment effect for male candidates and female candidates is not the same, then the effect of winning (or losing) an election is different across genders. The horizon $t+k$ is defined differently depending on the setting (see 3.3.2).

[2] The recent results uncovered by Marshall (2022), on the issues that arise from the specific use of close elections RD designs to estimate the effect of various politicians' characteristics (e.g., politicians' gender, race or ethnicity, clan, religious identity, criminal history, prior incumbency, seniority, party membership, ideology, etc.) on different outcomes do not apply to this analysis. Close elections applications of RD designs to estimate the effects of a politician getting elected on subsequent election outcomes are considered standard by Marshall (2022).

3.3.2. Regression specifications

The baseline regression is as follows:

$$Y_{i,t+k} = \lambda_t + \lambda_m + \beta ElectoralResult_{i,t} + f(Margin_{i,t}) + ElectoralResult_{i,t} \times f(Margin_{i,t}) + \epsilon_{i,t} \quad (2)$$

To estimate the size of the incumbency effect, $ElectoralResult_{i,t}$ takes a value of one if candidate i in municipality m running for political office p won in initial election year t, and zero otherwise. The coefficient of interest β represents the effect of winning on candidates' probability of re-running in the next election ($t+1$), and their probability of re-running and winning. To estimate the magnitude of the effect of an electoral loss, $ElectoralResult_{i,t}$ takes on a value of one if candidate i in municipality m lost in initial election year t, and zero otherwise. All other variables are defined as above. The coefficient of interest β represents the effect of losing an initial election on candidates' subsequent political participation. To get around great variation in term length across provinces, I define subsequent political participation as whether an individual runs again in any election within the next two opportunities (based on the term length of the position they initially ran for). For example, if a candidate runs for a councillor position in 2005, with a term length of 3 years, the $t+2$ horizon is equal to 6 years, but if a candidate runs for a mayoral seat with a term length of 2 years, then the $t+2$ horizon corresponds to 4 years.

In order to efficiently identify the differential effects for men and women, I also estimate the following regression:

$$\begin{aligned} Y_{i,t+k} = {} & \lambda_t + \lambda_m + \beta ElectoralResult_{i,t} + \varphi Female_i + f(Margin_{i,t}) + \gamma(Female_i \times ElectoralResult_{i,t}) \\ & + (ElectoralResult_{i,t} \times f(Margin_{i,t})) + (Female_i \times f(Margin_{i,t}) \times ElectoralResult_{i,t}) + \epsilon_{i,t} \end{aligned} \quad (3)$$

where $Female_i$, is an indicator variable that takes a value of one if the candidate is female. The coefficient β now represents the effect of winning or losing for men, and ϕ represents the difference in the outcome of interest between male and female close winners. The coefficient γ represents the differential effect of being an incumbent, for women relative to men and the differential effect of losing, for women relative to men.

For inference, I use the local linear RD estimator, which delivers a good compromise between simplicity, precision, and stability (Cattaneo et al., 2019), and a data-driven mean squared error optimal bandwidth selector from Calonico et al. (2017) to test the sensitivity of the results by varying the bandwidth around the threshold. In every specification, I include municipality, type of office and election year fixed effects as controls, and I cluster standard errors at the municipality-by-type of office level.

3.4. Identifying assumption

The key identifying assumption in a regression discontinuity design is the continuity assumption. It states that the potential outcomes, and all other unobserved determinants of the outcome, are continuous around the threshold. The assumption would be threatened if candidates were able to perfectly sort around a margin of victory (or defeat) of 0—implying that candidates can exert some influence over their final share of votes, which is unlikely for at least two reasons: unpredictable factors on the day of the election and limited information on voters' intentions (Granzier et al., 2019).

To support the validity of the assumption, I perform three empirical validation tests based on (i) covariates balance, (ii) the continuity of the running variable density around the cut-off, and (iii) the treatment effect at artificial cut-off values.

To perform the covariate balance test, I estimate Eq. (2) with the following dependent variables: vote share, term length, number of individuals elected as a result of the race, total votes, and gender in order to examine whether, near the cut-off, treated units are similar to control units in terms of observable characteristics. The coefficients on $ElectoralResult_{i,t}$ are reported in Table A.1 and Fig. A.2 shows valid smoothness of observable characteristics around the threshold and not one of the coefficients is statistically significant. Moreover, the McCrary density test, which evaluates whether the number of observations below the cut-off is dramatically different from the number of observations above it, is satisfied by construction in this setting (Figs. A.3 and A.4) since I consider the same set of races in both sides of the threshold and in each race, the winner and the runner-up are equally distant to the cut-off. Finally, I estimate Eq. (2) using artificial cut-off values to assess whether there are jumps in the observed regression functions at points other than the true cut-off (of 0). As displayed in Table A.2 and Fig. A.5, I find that in all artificial cut-off points, the point estimates are insignificant and smaller (in absolute value) than the true estimate. Overall, these three falsification tests lend support to the validity of the continuity assumption.

4. Results

4.1. Effect of incumbency on subsequent political participation and success

4.1.1. Full sample

In Tables A.3 and A.4, I present estimates of the effect of incumbency on subsequent political participation and success, respectively—and I report the estimate of β from Eq. (2) for all candidates, as well as for men and women separately. In all regression tables, the first column uses the optimal bandwidth computed from Calonico et al. (2017), and the second and third columns use twice and half the optimal bandwidth, respectively, while the fourth column uses two different optimal bandwidth selectors (below and above the cut-off). From Fig. 1, we observe clear discontinuities at the threshold of zero, represented by a dotted vertical line at zero, with winning candidates to the right of the threshold this time, and losing candidates to the left. I fit a global polynomial on each side of the cut-off, and the vertical distance measures two different components of the incumbency advantage. In Panel B of Fig. 1, the unconditional incumbency effect is represented—which is defined as the effect of incumbency on the probability

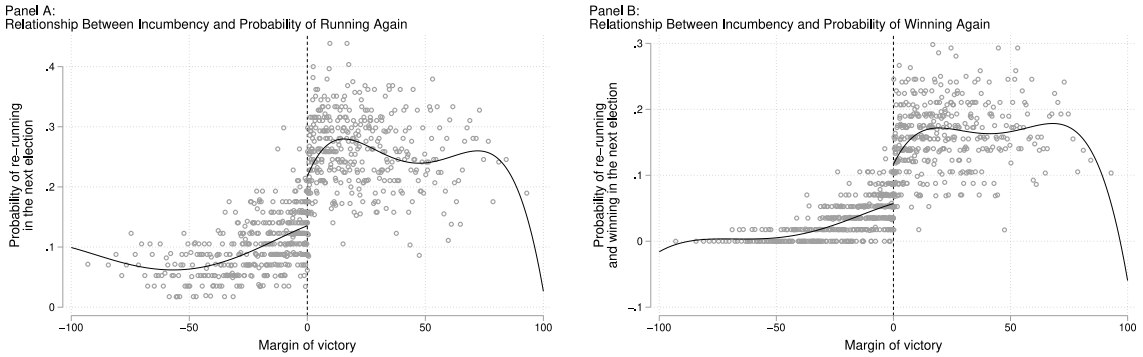


Fig. 1. Relationship between margin of victory and incumbency advantage.
Note: This figure is a RD plot scatter of the probability of running again in the next election (panel A) and the probability of running in and winning the next election (panel B) against candidates' margin of victory in the initial election (on the x-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the winning threshold.

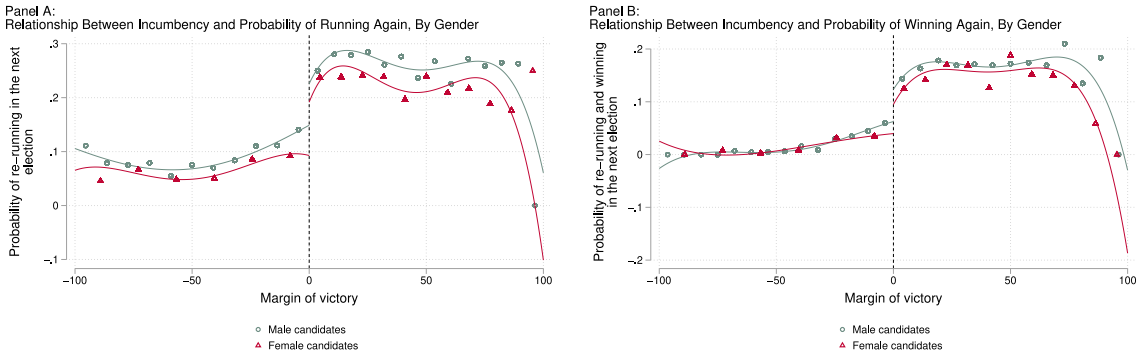


Fig. 2. Relationship between margin of victory and incumbency advantage, by gender.
Note: This figure is a RD plot scatter of the probability of running again in the next election (panel A) and the probability of running in and winning the next election (panel B) against candidates' margin of victory in the initial election (on the x-axis), for quantile-spaced bins. I plot these outcomes for male and female candidates separately. A global polynomial fit is plotted on either side of the winning threshold. In all three panels, I plot RD plot scatters and include global polynomial fits separately for male and female candidates.

of running in and winning the next election. However, since it is also likely that the probability of running again is affected by incumbency status, the effect of incumbency on that decision is also shown in Fig. 1 Panel A.

I find a strong incumbency effect in all candidates. Estimates from Table A.3 Panel (i) reveal that close winners are 7 percentage points more likely to re-enter in the next election than close losers, while estimates from Table A.4 Panel (i) report that only 5.6 percentage points of close winners are more likely to rerun in the next election and win, compared to close losers. These results are all significant at the 1% level.

4.1.2. Gender gaps in incumbency advantage

Fig. 2 shows the relationship between incumbency and the probability of running again (Panel A) and the probability of running again and winning (Panel B) and exhibits clear discontinuities at the cut-off in both. According to Panels (ii) and (iii) of Table A.3, there is a positive and significant effect on the propensity to run again in the next election of 6.8 percentage points among men and of 6.9 percentage points among women. Further, from Panels (ii) and (iii) of Table A.4, we can see that there is a positive and significant effect on incumbent candidates' probability of winning the next election of 5.8 percentage points among men and of 5.6 percentage points among women. To confirm these results, I estimate the differential effect of incumbency, for women relative to men—and report the estimate of γ from Eq. (3) in Table A.5. Female candidates are reportedly 1.8 percentage points less likely to run again and 1 percentage point less likely to win again in the next election, relative to male candidates, but these results do not reach any satisfactory level of significance. As such, I find no evidence of a gendered incumbency effect on the probability of running again or the probability of running again and winning the next election.

4.1.3. Incumbency advantages across Canada

Next, I explore whether there are heterogeneous effects by province. In Tables A.6 and A.7, I report the estimate of β from Eq. (2) separately for female candidates in Quebec and in the rest of Canada. In Fig. 3, we can observe a larger jump in female

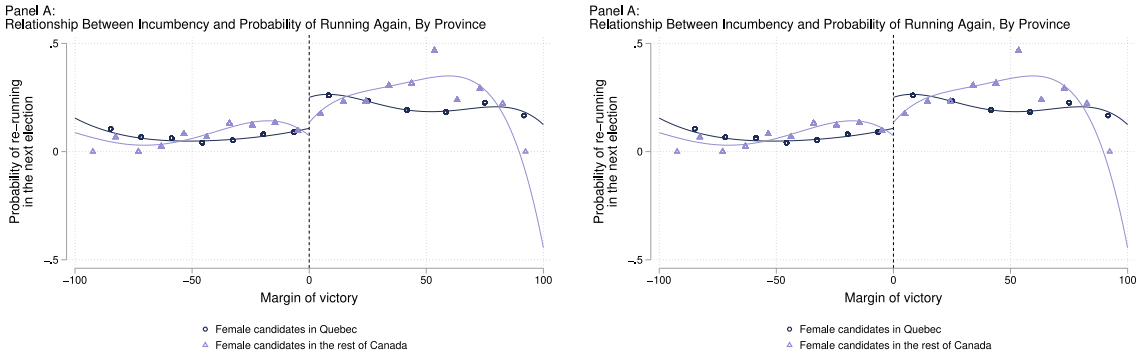


Fig. 3. Relationship between margin of victory and incumbency advantage, by province.
Note: This figure is a RD plot scatter of the probability of running again in the next election (panel A) and the probability of running in and winning the next election (panel B) against candidates' margin of victory in the initial election (on the x-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the winning threshold. I plot RD plot scatters and global polynomial fits for female candidates running in Québec and female candidates running in the rest of Canada separately.

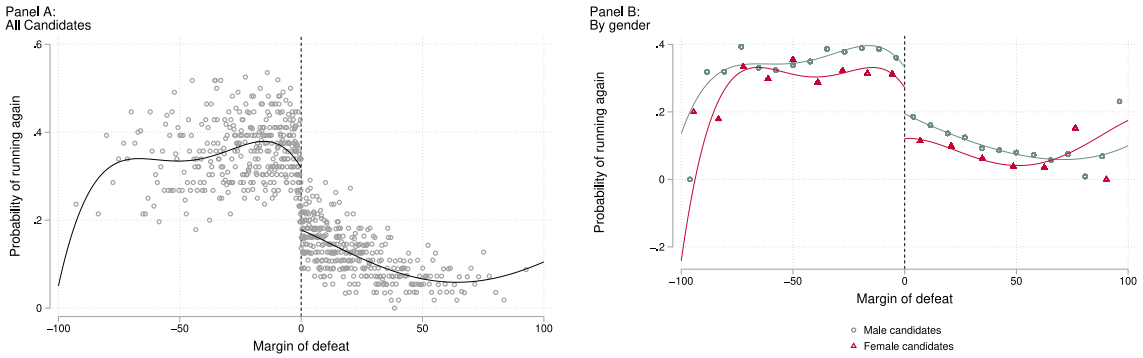


Fig. 4. Relationship between margin of defeat and subsequent political participation (all candidates).
Note: This figure is a RD plot scatter of the probability that candidates run again for office within the next two available opportunities (on the y-axis) against candidates' margin of defeat in the initial election (on the x-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the losing threshold. Panel A pools all candidates. Panel B plots RD plot scatters and global polynomial fits for male and female candidates separately.

candidates' propensity to run again in Quebec, compared to female candidates in the rest of Canada, as well as in their probability to win again—although the magnitude of the jump seems to be greater in Panel A.

Among women in Quebec, close winners are estimated to be 16.2 percentage points more likely to re-enter politics and 8.3 percentage points more likely to win again compared to close losers, while among women in the rest of Canada, close winners are 3.9 percentage points more likely to run again and 1.4 percentage points more likely to win in the next election than close losers. However, for female candidates in the rest of Canada, the estimates are indistinguishable from zero. Although the insignificance of the estimates in Panel (iii) of both Tables A.6 and A.7 could be attributed to low statistical power, the results reinforce the disparities in the political opportunity structure faced by women in these different provinces.

4.2. Effect of losing on subsequent political participation

4.2.1. Full sample

Table A.8 presents estimates of the effect of losing on subsequent political participation—and I report the estimate of β from Eq. (2) for all candidates, as well as for men and women separately. Fig. 4 complements Table A.8 with graphical evidence of clear discontinuities at the threshold of zero, represented by a dotted vertical line at zero, with winning candidates to the left of the threshold, and losing candidates to the right. A global polynomial is fit on each side of the cut-off, and the jump represents the deterrence effect of losing. Generally, near losers are estimated to be 14.1 percentage points less likely to re-enter politics compared to near winners. Table A.9 and Fig. 5 offer similar results, with a separate focus on novice candidates—candidates who are observed for the first time in the data set. The results from Table A.9 are comparable to those in Wasserman (2021). Similarly, novice near losers are 15.3 percentage points less likely to re-enter politics than near winners in Canada—while Wasserman documents a negative effect of 19.5 percentage points among Californian local politicians.

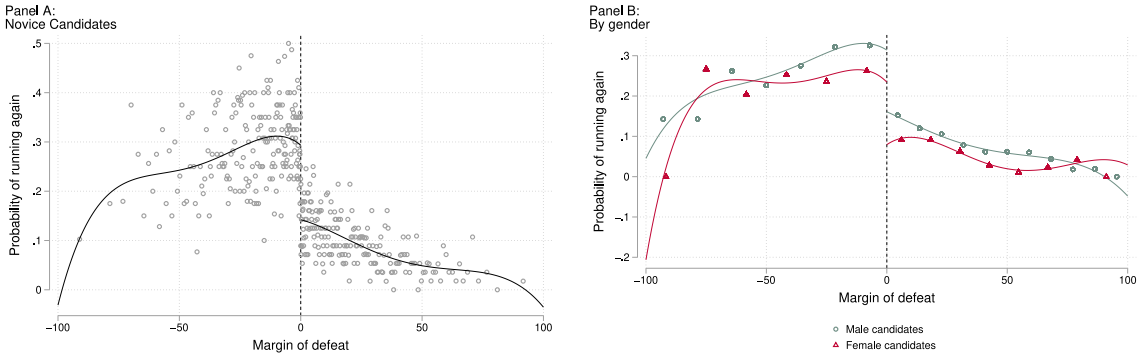


Fig. 5. Relationship between margin of defeat and subsequent political participation (novice candidates).
Note: This figure is a RD plot scatter of the probability that candidates run again for office within the next two available opportunities (on the *y*-axis) against candidates' margin of defeat in the initial election (on the *x*-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the losing threshold. Panel A pools all candidates. Panel B plots RD plot scatters and global polynomial fits for male and female candidates separately. The sample is restricted to candidates who are observed for the first time in the data set.

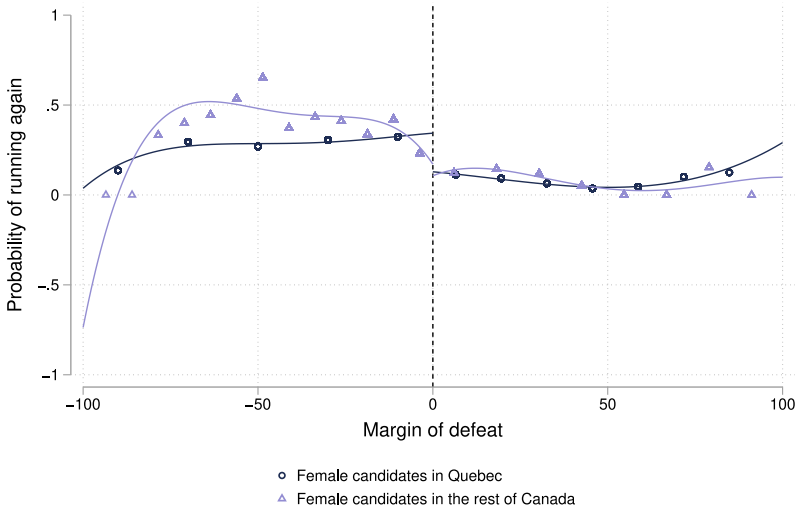


Fig. 6. Relationship between margin of defeat and subsequent political participation, by province.
Note: This figure is a RD plot scatter of the probability that candidates run again for office within the next two available opportunities (on the *y*-axis) against candidates' margin of defeat in the initial election (on the *x*-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the losing threshold. I plot RD plot scatters and global polynomial fits for female candidates running in Québec and female candidates running in the rest of Canada separately.

4.2.2. Gender gaps in politician persistence

From Panels (ii) and (iii) of Tables A.8 and A.9, we can see that, among men, there is a negative and significant effect on the propensity to run again for office ranging from 14.9 to 16.6 percentage points, while among women, there is a smaller but still negative and significant effect of 11.8 to 14.3 percentage points. Moreover, I estimate the differential effect of losing, for women relative to men—and report the estimate of γ from Eq. (3) in Table A.10. Female candidates are reportedly from 1 (all) to 1.8 (novices) percentage points more likely to run again after an electoral loss, relative to male candidates, but the estimates are statistically insignificant. These results suggest that female candidates are not differentially deterred by losing—in fact, men are (weakly) more deterred by losing than women. This modest difference does not seem to be driven by either type of candidates. Panel B of Figs. 4 and 5 show that there are differences in the male and female winning candidates' propensities to run again, but they are somewhat offset by that of the losing candidates.

4.2.3. Politician persistence across Canada

Again, I explore whether there are heterogeneous effects across Canada. In Table A.11, I report the estimate of β from Eq. (2) separately for female candidates in Quebec and in the rest of Canada. In Fig. 6, we can observe a larger drop in female candidates' propensity to run again in Quebec, compared to the rest of female candidates in Canada. Among women in Quebec, near losers are estimated to be 21.4 percentage points less likely to re-enter politics compared to near winners, while among women in the rest of Canada, near losers are 1.5 percentage points less likely to run again than near winners—a smaller and insignificant difference,

nonetheless. These results are in contradiction to the idea that political parties help create opportunities for women (Bherer and Breux, 2011), yet suggest that a more formal involvement of political parties does shape opportunities differently for women or create new constraints, with the province of Quebec being the only province where official municipal political parties exist.

4.3. Extensions

4.3.1. Heterogeneity by type of electoral district

There is evidence that electoral rules affect women's representation, and that proportional systems improve women's electoral success (Profeta and Woodhouse, 2022). The ward system, which divides a municipality into a number of areas from which a given number of members will be elected to the council, promotes better representation across the city. Further, since the area and the electorate are smaller, campaigning costs are lower and recognition in the community has the potential to be greater (Crawford, 1954). As reported in Tables A.12 and A.13, close winners under the ward system are estimated to be 12.7 percentage points more likely to re-enter politics and 9.1 percentage points more likely to win again compared to close losers, while there is no significant effects for candidates under the at-large system. In contrast, over a medium-term horizon, compared to near winners, near losers are estimated to be 19.1 percentage points less likely to re-enter politics under the ward system, and the same group is 6.6 percentage points less likely to re-enter politics under a general vote (Table A.14).[3]

Further, I examine whether there are gender differences by estimating Eq. (2) separately for male and female candidates under the two types of electoral district. Although some of the estimates are not significant at any level, Fig. A.9 documents weak evidence of a greater incumbency advantage enjoyed by female candidates performing under the ward system, as well as a greater medium-term impact after an electoral loss (Fig. A.8).

4.3.2. Heterogeneity by type of office

The particularities associated with mayoral and council roles have been discussed in the literature. On the one hand, a mayor's public-facing role allows for more contact with the community and receives more media attention than a municipal councillor, which points towards a higher incumbency advantage in mayoral races. On the other hand, the personal costs of an electoral loss are arguably greater at the mayoral level, which also suggests a larger attrition effect at that position (Lucas, 2021).

I investigate this question by estimating Eq. (2) separately for male and female candidates and allowing for heterogeneous effects for candidates running for mayor, councillor, or other municipal positions. Remarkably, female candidates benefit from stronger incumbency effects than male candidates in mayoral elections, while the reverse appears to be the case at the municipal council level—but only for the measure of electoral success (Fig. A.10). Moreover, excluding the estimates that do not attain satisfactory levels of significance, the effects of an electoral loss are of similar size across genders for candidates running for a municipal council seat (Fig. A.11). Pooled estimates for all candidates are available in Tables A.15, A.16 and A.17 (with corresponding Figs. A.12 and A.13).

4.3.3. Heterogeneity by level of electoral competition

Gender differences in men and women's competitiveness is well-documented. For instance, Niederle and Vesterlund (2007) find that men's overconfidence and differences in preferences for entering competitive environments are causes for low-ability men to enter competitions too much, while high-ability women do not as much. As a measure of the level of competition in a given electoral race, I use the ratio of the number of candidates in a given race to the number of seats available. This electoral competition "score" ranges from 1.1 to 65, with participation varying between 2 to 71 candidates contending for a given position. I classify electoral races as competitive and non-competitive and estimate Eq. (2) separately for male and female candidates and for each sub-sample (Figs. A.14 and A.15). Races with a level of competition above the mean are considered competitive, and those with a level of competition below the mean are considered non-competitive (or, less competitive). On average, the level of electoral competition is equal to 2.57—indicating that a little over double as many candidates run as there are seats.

Female candidates appear to enjoy greater incumbency advantages than men when competition is less intense, but only as it relates to the probability to run again in the next elections. Estimates are of similar magnitude across genders when evaluating the effect of incumbency advantage and subsequent political success. Further, as anticipated, both men's and women's propensity to run again after an electoral loss is higher in competitive settings than it is in non-competitive settings. Again, pooled estimates for all candidates are available in Tables A.18, A.19 and A.20 (with corresponding Figs. A.16 and A.17).

4.4. Discussion

My results align with work by Bernhard and de Benedictis-Kessner (2021), who find that men and women candidates are similarly persistent after losing elections, while Wasserman (2021), Baskaran and Hessami (2018) and Peveri and Sangnier (2021) conclude the opposite (women are less likely to persist) for local elections in the United States, Germany, and France. Nonetheless, Peveri and Sangnier (2021) does not identify a gender gap in incumbent candidates' success rates.

Identifying the specific differences in countries' institutional, political or cultural context that may explain this divergence is a complex task. Darcy (1994) finds that women do better municipally in the United States, compared to their situation at the upper

[3] Graphical representation of those effects is presented in Figs. A.6 and A.7.

levels, and we find a similar situation in France (Kjaer, 2010). In contrast, women in Germany do slightly better at the higher level (Ceciarini, 2019). Local elections in Germany operate under an open-list electoral rule, while electors are elected according to a two-round ordered- and closed-list voting system in France—two settings in which gender differences were detected. However, California and Canada both use a plurality voting system, which makes it unlikely that this factor alone is responsible.

As previously established, Canada has relatively high levels of electoral turnover (13.01%) in comparison to France (9.77%), the United States (7.51%) and Germany (5.77%) (Matland and Studlar, 2004). This variation might be one of the most plausible justifications so far. Indeed, Young (1991) presents evidence that the high rates of turnover in Canadian legislative elections have a positive effect on women's election, by increasing their opportunities to break through.

It is most likely that differences across attitudes towards gender equality do not account for the mixed results, and that context across developed countries is comparable. More explicitly, the above mentioned countries fare similarly in country measures of their scores for the Gender Social Norms Index (GSNI), which measures how social beliefs obstruct gender equality in areas like politics, work, and education, as well as for the Global Gender Gap Index, which assesses the current state and evolution of gender parity across four key dimensions, including political empowerment (Fig. A.18).[4]

5. Conclusion

The principle of representation dictates that men and women serve as elected officials in equal capacity across all levels of government. Given women represented 49% of the world population in 2021 (The World Bank, 2022), local deliberative bodies remain an inaccurate reflection of demographics. This paper was motivated by the potential implications of understanding whether low female representation is driven by differential drop-out rates or incumbency advantages. The results have substantial value for municipal elections research, a growing field in Canada. It serves as a starting point to understand how the presence (and absence) of political parties and electoral institutions shape outcomes and may inspire discussion on the consequences of electoral reform. Municipal policy is responsible for many issues that have a direct and daily impact on its constituency and, as such, proper political representation, and all its components, are an important question in political science.

Using a close elections design and detailed data from the Canadian Municipal Elections Database (CMED), I find that female candidates are not differentially deterred by losing and find no evidence of a gendered incumbency effect on the probability of running again or the probability of running again and winning the next election. Nonetheless, I uncover significant incumbency advantage: female incumbents are 6.9 percentage points more likely to run again in the next election, while male incumbents are 6.8 percentage points more likely to do so. Further, women who are incumbents are 5.3 percentage points more likely to win the next election and men are 6.2 percentage points more likely to prevail. Moreover, I do find that an initial loss significantly reduces the propensity for men to run again within the next two opportunities by 14.6 to 16.5 percentage points, whereas it reduces the propensity for women to run again by 12.2 to 13.2 percentage points, depending on the candidate's experience.

Potential explanations for a gender gap in behavior include differences in campaigning costs, psychic costs, and opportunity costs. One shortcoming of the data is the limited information available on candidates' personal characteristics, such as age, education level, and occupation. Testing for potential underlying mechanisms to explain the results (i.e. differences in campaigning and negotiating behavior (Cipullo, 2021), self-reported personality traits (Håkansson, 2021), opportunity costs (Wasserman, 2021), career-family tradeoffs (Brown et al., 2019)) is outside the scope of this study, but similar magnitudes in deterrence effects would support a self-selection at entry argument. Moreover, the finding of smaller incumbency effects for women reinforces the idea of the existence of voter bias. In future work, it would be of interest to explore the extent to which voter beliefs are a hindrance to female candidates' participation and success.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Acknowledgments

I am grateful to Matt Lowe and Heather Sarsons for their helpful advice and guidance. I thank Noor Kumar, three anonymous referees and the editor of this journal for insightful comments and suggestions.

Appendix

See Figs. A.1–A.18 and Tables A.1–A.20.

[4] Data from United Nations Development Program (UNDP, 2020) and the World Economic Forum (World Economic Forum, 2022).

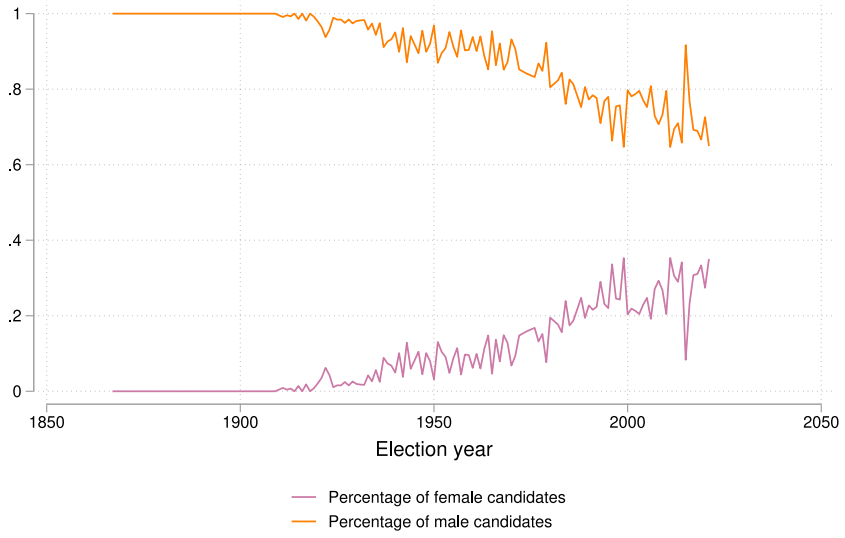


Fig. A.1. Percentage of women candidates over time.
Note: This figure plots the percentage of female candidates in the sample, between 1867 and 2021. Women are noticeably underrepresented, and this imbalance is not only driven by the earlier years of the sample.

Table A.1
Testing covariate balance: Effect of electoral loss on predetermined covariates.

	Bandwidth used	RD estimate	Robust standard error	P-value	Conf. Interval	Effective *N*
Vote share	11.06	0.09	0.53	0.74	[−0.86, 1.20]	16460
Term length	13.65	0.01	0.06	0.90	[−0.11, 0.13]	17649
Magnitude	10.99	−0.04	0.08	0.47	[−0.21, 0.10]	16390
Total number of votes	17.89	−212.12	3552.72	0.89	[−7437, 6489]	22969
Female indicator	19.18	−0.00	0.01	0.95	[−0.02, 0.02]	24092

Note: This table reports RD estimates corresponding to equation (2) for vote share, term length, number of individuals elected as a result of the race (magnitude), total votes, and gender. I report robust standard errors, the *p*-value associated with the robust confidence interval, the number of observations in the sample and the MSERD-optimal bandwidth used.

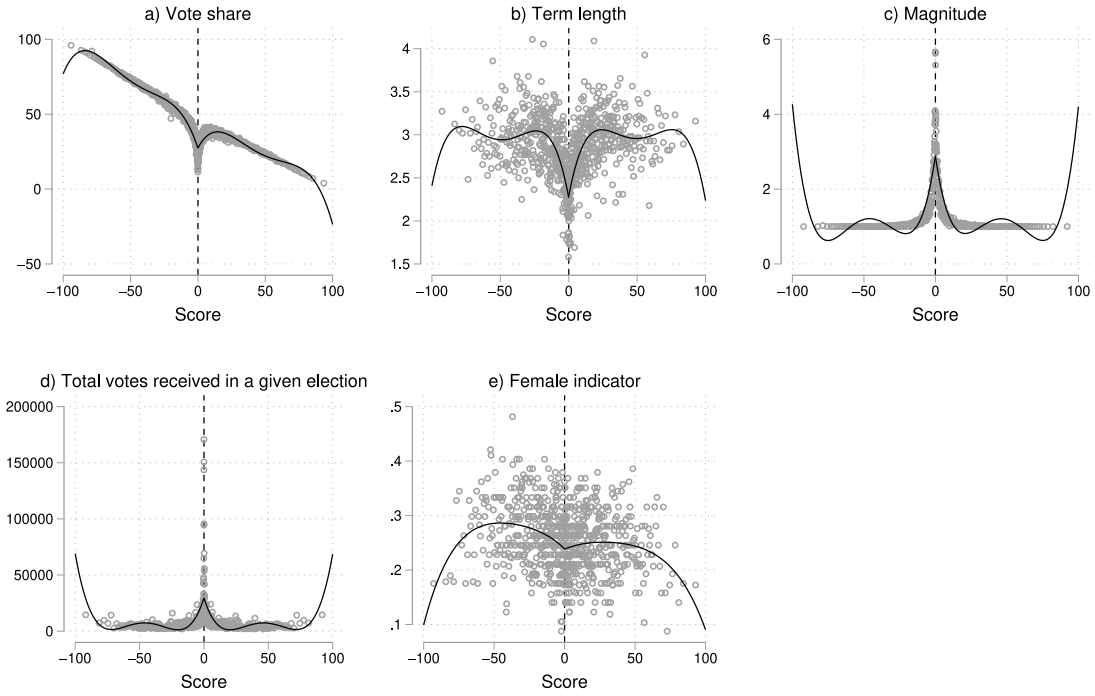


Fig. A.2. Testing covariates balance: Effect of electoral loss on predetermined covariates.
Note: This figure reports RD plots corresponding to Eq. (2). The dependent variables are: vote share, term length, number of individuals elected as a result of the race (magnitude), total votes, and gender. This covariate balance test shows valid smoothness of observable characteristics.

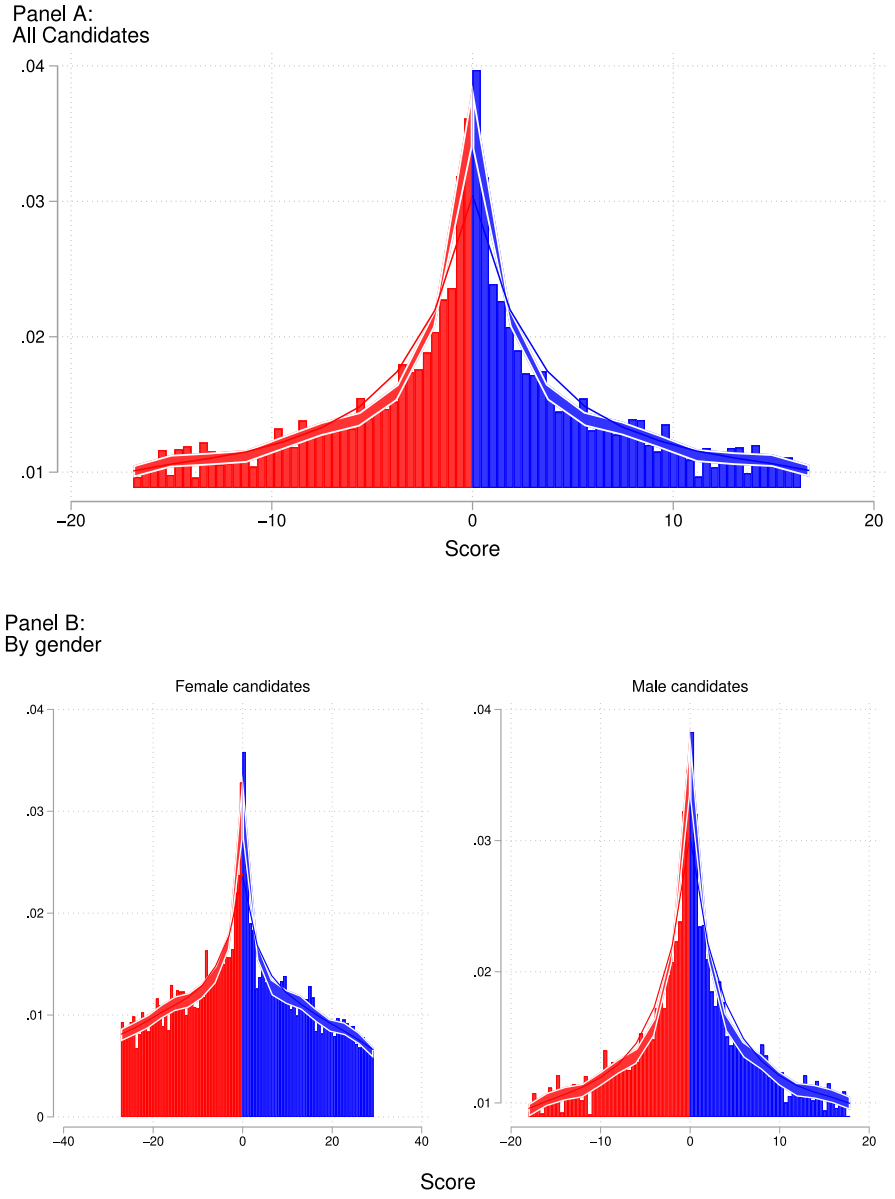


Fig. A.3. Distribution of margin of defeat for McCrary density test (all candidates).
Note: This figure tests if there is a jump at the threshold in the density of the running variable (score=0). The test satisfied by construction in this setting since I consider the same set of races of both sides of the threshold and in each race, the winner and the runner-up are equally distant to the cut-off. Panel A includes all candidates in the restricted sample, and panel B restricts the sample to female and male candidates, separately.

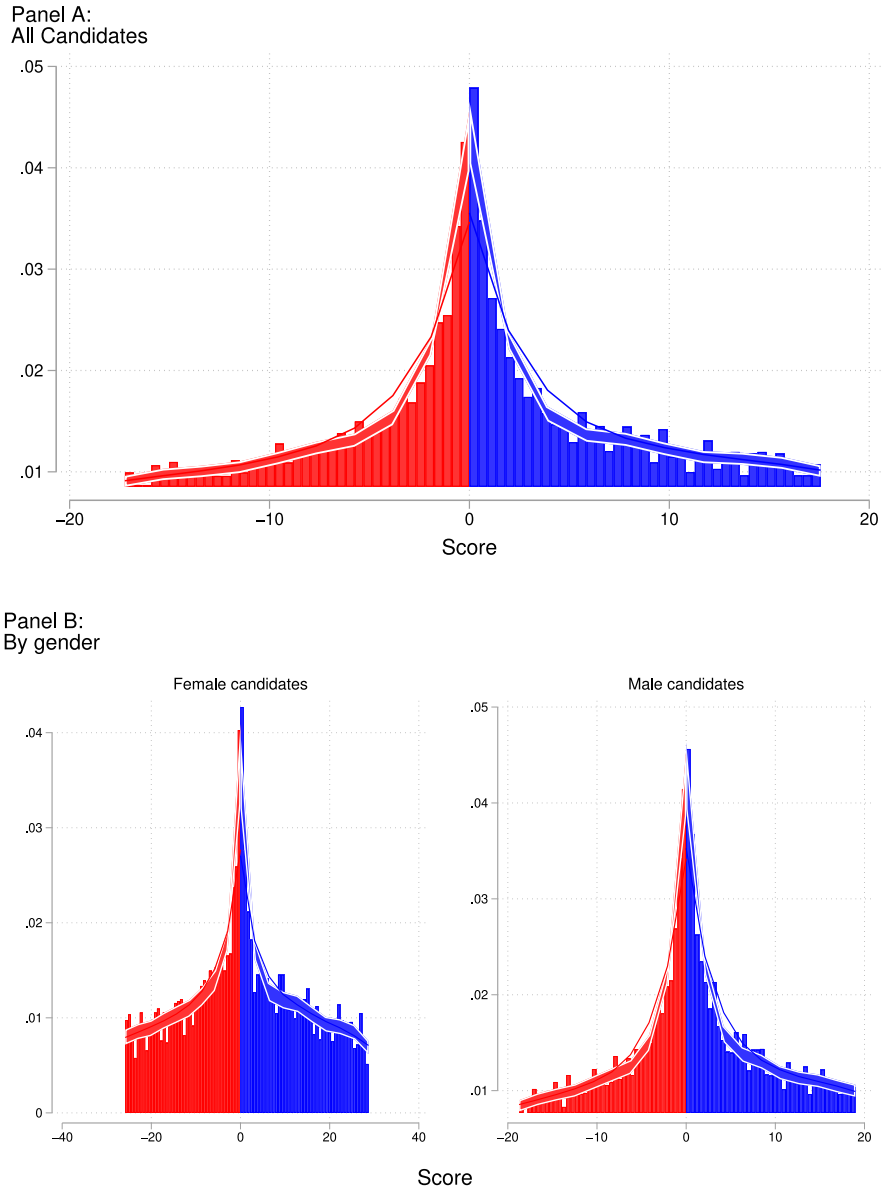


Fig. A.4. Distribution of margin of defeat for McCrary density test (restricted to novice candidates).
Note: This figure tests if there is a jump at the threshold in the density of the running variable (score=0). The test satisfied by construction in this setting since I consider the same set of races of both sides of the threshold and in each race, the winner and the runner-up are equally distant to the cut-off. Panel A includes all candidates in the restricted sample, and panel B restricts the sample to female and male candidates, separately. The sample is restricted to candidates who are observed for the first time in the data set.

Table A.2
Continuity-Based analysis for alternative cutoffs.

Alternative cut-off	Bandwidth used	RD estimate	*P*-value	Conf. Interval	Eff. *N* to the left	Eff. *N* to the right
	Panel A: Outcome: participation in the immediate next election					
−3	2.529	−0.026	0.795	[0.795, −0.077]	1764	2492
−2	2.995	−0.055	0.264	[0.264, −0.107]	2234	2438
−1	3.267	0.023	0.656	[0.656, −0.065]	2734	1445
0	11.529	0.060	0.000	[0.000, 0.030]	8411	8493
1	2.870	−0.017	0.236	[0.236, −0.147]	1510	2484
2	3.131	0.014	0.617	[0.617, −0.059]	2504	2345
3	2.807	−0.021	0.757	[0.757, −0.089]	2905	1970
	Panel B: Outcome: participation in the next two elections					
−3	2.808	0.025	0.464	[0.464, −0.051]	1969	2906
−2	3.151	−0.016	0.823	[0.823, −0.075]	2353	2440
−1	2.749	0.003	0.255	[0.255, −0.039]	2391	1446
0	12.835	−0.106	0.000	[0.000, −0.127]	9059	9109
1	3.064	−0.013	0.793	[0.793, −0.075]	1509	2604
2	3.079	0.041	0.285	[0.285, −0.033]	2502	2298
3	2.482	0.019	0.886	[0.886, −0.067]	2430	1730

Note: This table reports RD estimates corresponding to equation (2), estimated at different cut-off values for both short- and medium-term outcomes. The true cut-off of 0 is included in order to have a benchmark to compare. All other cut-offs are artificial or placebo, in the sense that treatment did not actually change at those points. I report robust standard errors, the *p*-value associated with the robust confidence interval, the number of observations in the sample and the MSERD-optimal bandwidth used.

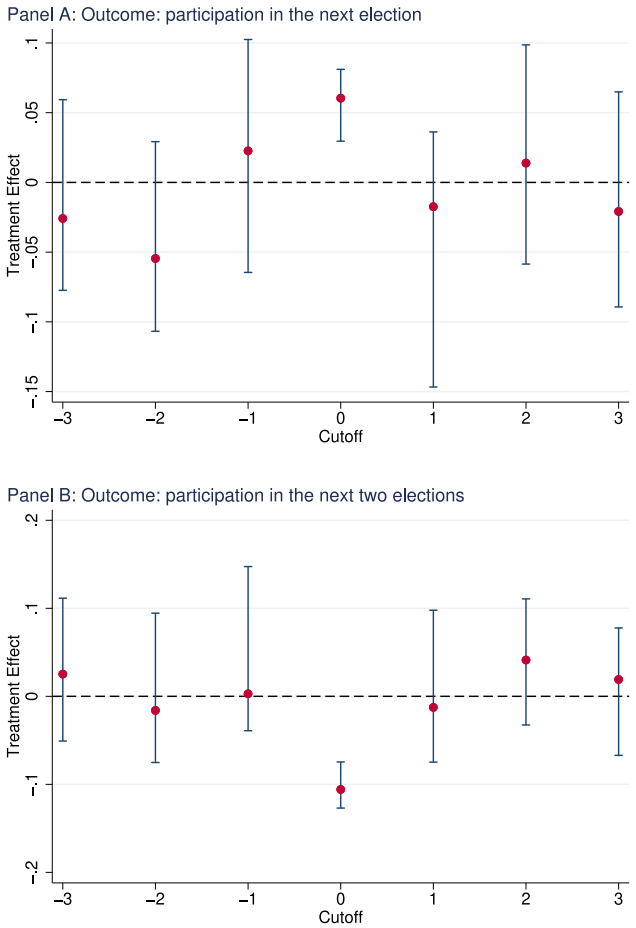


Fig. A.5. Estimation of treatment effect for true and artificial cutoffs.
Note: This figure contrasts RD estimates corresponding to Eq. (2), for both short- and medium-term outcomes. estimated at different cut-off values. The true cut-off of 0 is included in order to have a benchmark to compare. All other cut-offs are artificial or placebo, in the sense that treatment did not actually change at those points.

Table A.3
Effect of incumbency on subsequent political participation: Baseline specification.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
		i. *All Candidates*		
Incumbency	0.070***	0.036	0.094***	0.058***
	(0.02)	(0.02)	(0.01)	(0.01)
Bandwidth	7.61	3.81	15.23	21.63/6.06
Observations	45,470	45,470	45,470	45,470
		ii. *Male Candidates*		
Incumbency	0.068***	0.052*	0.091***	0.068***
	(0.02)	(0.02)	(0.02)	(0.01)
Bandwidth	9.67	4.83	19.33	23.87/7.26
Observations	33,808	33,808	33,808	33,808
		iii. *Female Candidates*		
Incumbency	0.069***	0.057*	0.118***	0.065***
	(0.02)	(0.02)	(0.02)	(0.02)
Bandwidth	9.52	4.76	19.04	18.42/9.05
Observations	11,662	11,662	11,662	11,662
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs in the immediate next election. The independent variable is an indicator for whether the candidate is the incumbent of the office they are running for. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.4
Effect of incumbency on subsequent electoral success: Baseline specification.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
		i.*All Candidates*		
Incumbency	0.056***	0.048***	0.069***	0.054***
	(0.01)	(0.01)	(0.01)	(0.01)
Bandwidth	9.75	4.88	19.51	18.26/8.12
Observations	45,470	45,470	45,470	45,470
		ii. *Male Candidates*		
Incumbency	0.058***	0.052***	0.069***	0.054***
	(0.01)	(0.01)	(0.01)	(0.01)
Bandwidth	9.85	4.93	19.70	18.00/7.16
Observations	33,808	33,808	33,808	33,808
		iii. *Female Candidates*		
Incumbency	0.056***	0.045*	0.070***	0.061***
	(0.01)	(0.02)	(0.01)	(0.01)
Bandwidth	11.91	5.96	23.83	27.50/12.14
Observations	11,662	11,662	11,662	11,662
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs in the immediate next election and wins. The independent variable is an indicator for whether the candidate is the incumbent of the office they are running for. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.5
Effect of Electoral Loss on Subsequent Political Participation and Success, by Gender.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *Probability of running again*			
Female × Incumbent	−0.018	−0.014	0.015	−0.013
	(0.02)	(0.03)	(0.02)	(0.02)
Incumbent	0.079***	0.046	0.093***	0.077***
	(0.02)	(0.03)	(0.01)	(0.02)
Female	−0.022*	−0.019	−0.021**	−0.020**
	(0.01)	(0.02)	(0.01)	(0.01)
Bandwidth	7.61	3.81	15.23	21.63/6.06
Observations	12,830	7,939	20,854	18,577
	ii. *Probability of winning again*			
Female × Incumbent	−0.010	−0.015	0.002	−0.013
	(0.02)	(0.02)	(0.01)	(0.02)
Incumbent	0.062***	0.048**	0.070***	0.063***
	(0.01)	(0.02)	(0.01)	(0.01)
Female	−0.004	−0.001	−0.008	−0.007
	(0.01)	(0.01)	(0.01)	(0.00)
Bandwidth	9.75	4.88	19.51	18.26/8.12
Observations	12,830	7,939	20,854	18,577
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs again for office in the immediate next election, whether a candidate runs again and wins. The independent variables are an indicator for whether the candidate is the incumbent of the office they are running for and the interaction of that indicator variable and whether the candidate is female. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.6
Effect of incumbency on subsequent political participation, by province.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *Female candidates in Québec*			
Incumbency	0.162***	0.100**	0.171***	0.173***
	(0.03)	(0.03)	(0.02)	(0.02)
Bandwidth	15.28	7.64	30.55	21.97/14.86
Observations	8,912	8,912	8,912	8,912
	ii. *Female candidates in rest of Canada*			
Incumbency	0.039	0.036	0.063*	0.032
	(0.03)	(0.03)	(0.03)	(0.03)
Bandwidth	10.46	5.23	20.92	12.86/8.60
Observations	2,750	2,750	2,750	2,750
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs in the immediate next election. The independent variable is an indicator for whether the candidate is the incumbent of the office they are running for. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.7
Effect of incumbency on subsequent political success, by province.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *Female candidates in Québec*			
Incumbency	0.083***	0.088***	0.094***	0.095***
	(0.02)	(0.02)	(0.01)	(0.02)
Bandwidth	17.28	8.64	34.57	21.57/15.86
Observations	8,912	8,912	8,912	8,912
	ii. *Female candidates in rest of Canada*			
Incumbency	0.014	0.016	0.041*	0.009
	(0.02)	(0.02)	(0.02)	(0.02)
Bandwidth	9.80	4.90	19.60	10.88/8.00
Observations	2,750	2,750	2,750	2,750
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs in the immediate next election and wins. The independent variable is an indicator for whether the candidate is the incumbent of the office they are running for. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.8
Effect of electoral loss on subsequent political participation: Baseline specification.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
		i. *All Candidates*		
Lost	−0.141***	−0.122***	−0.162***	−0.129***
	(0.02)	(0.02)	(0.02)	(0.02)
Bandwidth	11.12	5.56	22.24	8.04/22.29
Observations	39,971	39,971	39,971	39,971
		ii. *Male Candidates*		
Lost	−0.149***	−0.131***	−0.164***	−0.141***
	(0.02)	(0.02)	(0.02)	(0.02)
Bandwidth	12.89	6.45	25.79	11.10/26.41
Observations	30,186	30,186	30,186	30,186
		iii. *Female Candidates*		
Lost	−0.118***	−0.093**	−0.164***	−0.121***
	(0.03)	(0.03)	(0.02)	(0.02)
Bandwidth	9.94	4.97	19.87	9.84/19.69
Observations	9,785	9,785	9,785	9,785
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs again for office within the next two available opportunities of a given election. The independent variable is an indicator for whether the candidate lost their given election. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.9
Effect of electoral loss on subsequent political participation: Baseline specification (Novice candidates).

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
		i. *All Candidates*		
Lost	−0.153***	−0.149***	−0.159***	−0.149***
	(0.03)	(0.03)	(0.02)	(0.03)
Bandwidth	14.47	7.24	28.95	13.84/20.14
Observations	19,179	19,179	19,179	19,179
		ii. *Male Candidates*		
Lost	−0.166***	−0.168***	−0.168***	−0.162***
	(0.03)	(0.03)	(0.02)	(0.03)
Bandwidth	16.63	8.31	33.26	15.12/23.04
Observations	13,937	13,937	13,937	13,937
		iii. *Female Candidates*		
Lost	−0.143***	−0.128***	−0.161***	−0.143***
	(0.03)	(0.04)	(0.02)	(0.03)
Bandwidth	12.98	6.49	25.96	14.69/17.04
Observations	5,242	5,242	5,242	5,242
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs again for office within the next two available opportunities of a given election. The independent variable is an indicator for whether the candidate lost their given election. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. The sample is restricted to candidates who are observed for the first time in the data set. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.10
Effect of electoral loss on subsequent political participation, by gender.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *Experienced and novice candidates*			
Female × Lost	0.010	0.034	0.008	−0.001
	(0.02)	(0.03)	(0.02)	(0.02)
Female	−0.023	−0.034*	−0.035***	−0.023
	(0.01)	(0.02)	(0.01)	(0.01)
Lost	−0.140***	−0.125***	−0.162***	−0.135***
	(0.02)	(0.02)	(0.01)	(0.02)
Bandwidth	11.12	5.56	22.24	8.04/22.29
Observations	14,531	8,782	23,659	17,489
	ii. *Novice candidates*			
Female × Lost	0.018	−0.006	0.027	0.015
	(0.02)	(0.03)	(0.02)	(0.02)
Female	−0.035*	−0.027	−0.045***	−0.031*
	(0.01)	(0.02)	(0.01)	(0.01)
Lost	−0.158***	−0.146***	−0.167***	−0.156***
	(0.02)	(0.03)	(0.02)	(0.02)
Bandwidth	14.47	7.24	28.95	13.84/20.14
Observations	8,252	4,913	13,249	9,357
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs again for office within the next two available opportunities of a given election. The independent variable are an indicator for whether the candidate lost their given election and the interaction of this indicator and whether the candidate is female. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. In panel (ii), the sample is restricted to candidates who are observed for the time in the data set. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.11
Effect of electoral loss on subsequent political participation, by province.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *Female candidates in Québec*			
Lost	−0.214***	−0.196***	−0.212***	−0.217***
	(0.03)	(0.04)	(0.02)	(0.03)
Bandwidth	19.19	9.60	38.39	18.65/22.75
Observations	8,028	8,028	8,028	8,028
	ii. *Female candidates in rest of Canada*			
Lost	−0.015	−0.022	−0.051	−0.004
	(0.04)	(0.04)	(0.04)	(0.04)
Bandwidth	7.23	3.61	14.46	6.60/16.39
Observations	1,757	1,757	1,757	1,757
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs again for office within the next two available opportunities of a given election. The independent variable is an indicator for whether the candidate lost their given election. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.12
Effect of incumbency on subsequent political participation, by type of electoral district.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *At-large systems*			
Incumbency	0.021	−0.014	0.024	−0.012
	(0.02)	(0.02)	(0.02)	(0.02)
Bandwidth	7.70	3.85	15.40	9.19/5.19
Observations	10,106	10,106	10,106	10,106
	ii. *Ward systems*			
Incumbency	0.127***	0.109***	0.128***	0.123***
	(0.02)	(0.02)	(0.02)	(0.02)
Bandwidth	16.94	8.47	33.89	14.34/19.19
Observations	35,364	35,364	35,364	35,364
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs in the immediate next election. The independent variable is an indicator for whether the candidate is the incumbent of the office they are running for. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.13
Effect of incumbency on subsequent political success, by type of electoral district.

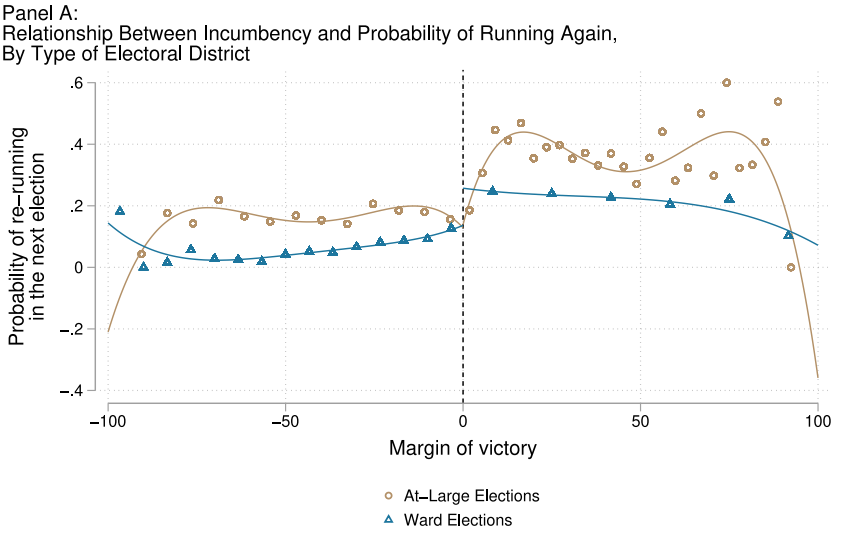
	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *At-large systems*			
Incumbency	0.017	0.011	0.025*	0.017
	(0.01)	(0.01)	(0.01)	(0.01)
Bandwidth	9.45	4.73	18.90	13.31/7.34
Observations	10,106	10,106	10,106	10,106
	ii. *Ward systems*			
Incumbency	0.091***	0.080***	0.092***	0.090***
	(0.01)	(0.01)	(0.01)	(0.01)
Bandwidth	15.95	7.97	31.89	18.71/12.66
Observations	35,364	35,364	35,364	35,364
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs in the immediate next election and wins. The independent variable is an indicator for whether the candidate is the incumbent of the office they are running for. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.14
Effect of electoral loss on subsequent political participation, by type of electoral district.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *At-large systems*			
Lost	−0.066**	−0.078**	−0.092***	−0.069*
	(0.03)	(0.03)	(0.02)	(0.03)
Bandwidth	10.71	5.35	21.41	7.17/9.17
Observations	8,069	8,069	8,069	8,069
	ii. *Ward systems*			
Lost	−0.191***	−0.168***	−0.189***	−0.186***
	(0.02)	(0.02)	(0.02)	(0.02)
Bandwidth	19.02	9.51	38.04	16.72/14.89
Observations	27,473	27,473	27,473	27,473
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs again for office within the next two available opportunities of a given election. The independent variable is an indicator for whether the candidate lost their given election. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.



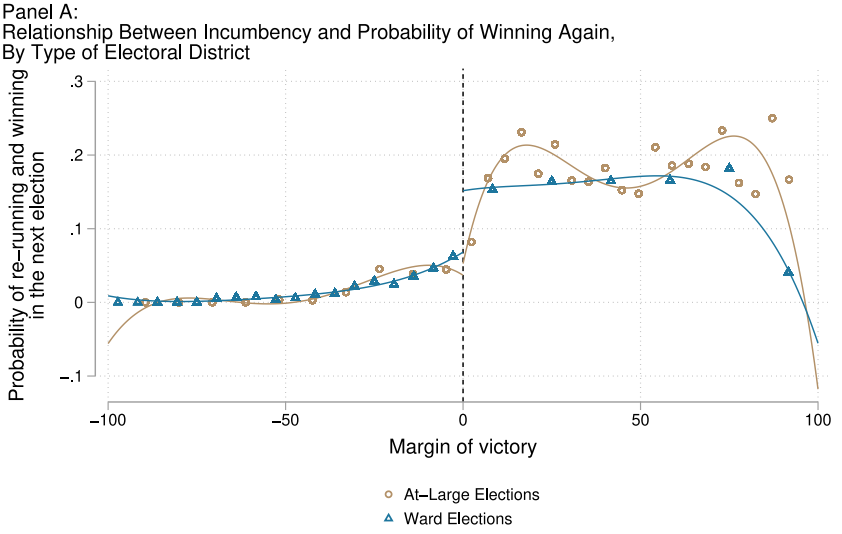


Fig. A.6. Relationship between incumbency advantage and downstream political outcomes, by type of electoral district.
Note: This figure is a RD plot scatter of the probability of running again in the next election (panel A) and the probability of running in and winning the next election (panel B) against candidates' margin of victory in the initial election (on the x-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the winning threshold. I plot RD plot scatters and include global polynomial fits separately for elections operating under at-large and ward systems.

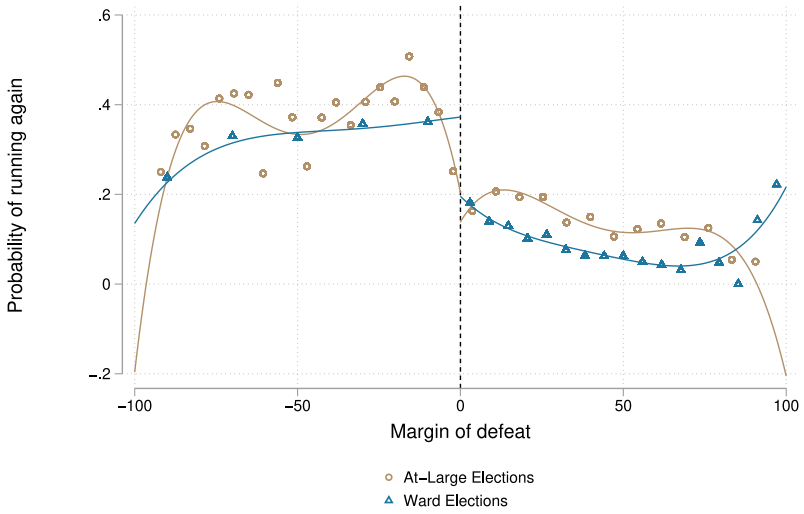


Fig. A.7. Relationship between margin of defeat and subsequent political participation, by type of electoral district.
Note: This figure is a RD plot scatter of the probability that candidates run again for office within the next two available opportunities (on the *y*-axis) against candidates' margin of defeat in the initial election (on the *x*-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the losing threshold. I plot RD plot scatters and include global polynomial fits separately for elections operating under at-large and ward systems.

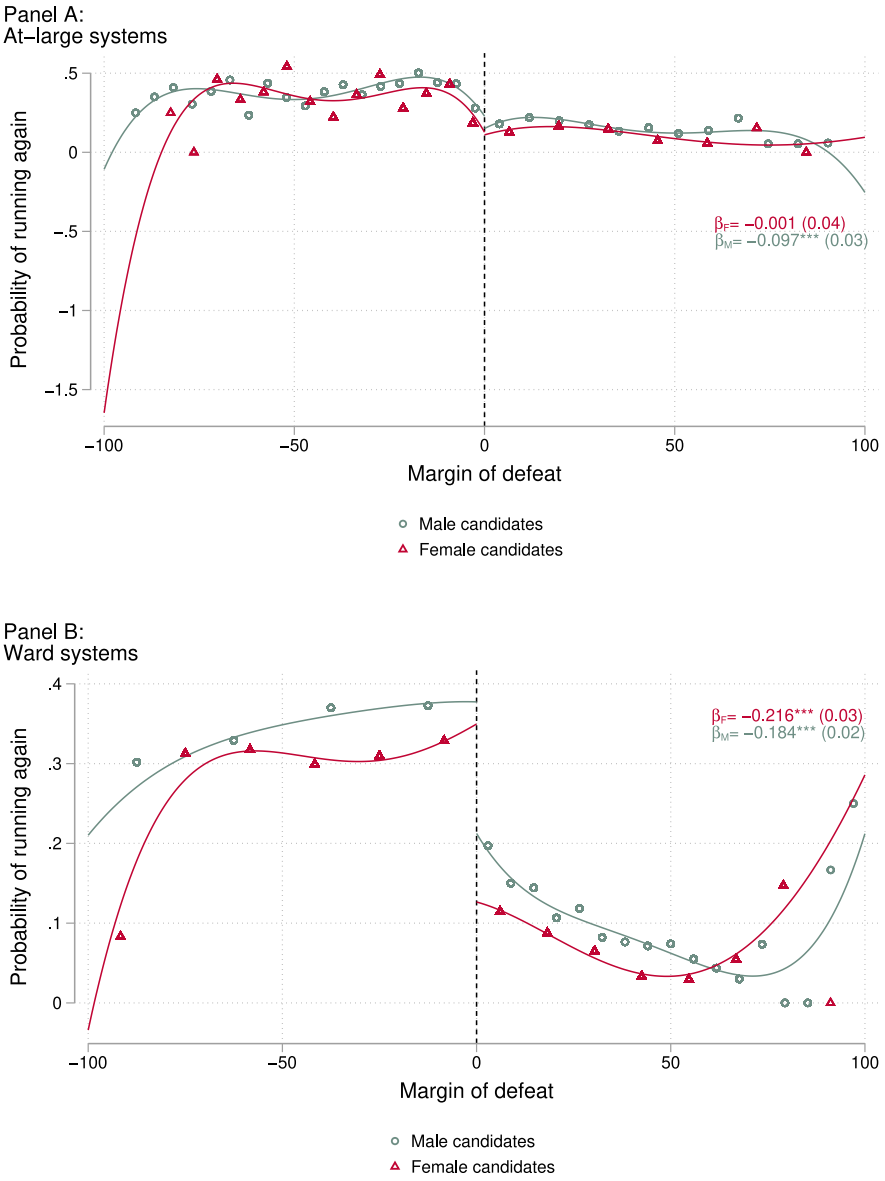


Fig. A.8. Relationship between margin of defeat and subsequent political participation, by gender and type of electoral district.
Note: This figure is a RD plot scatter of the probability that candidates run again for office within the next two available opportunities (on the *y*-axis) against candidates' margin of defeat in the initial election (on the *x*-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the losing threshold. In both panels, I plot RD plot scatters and include global polynomial fits separately for male and female candidates.

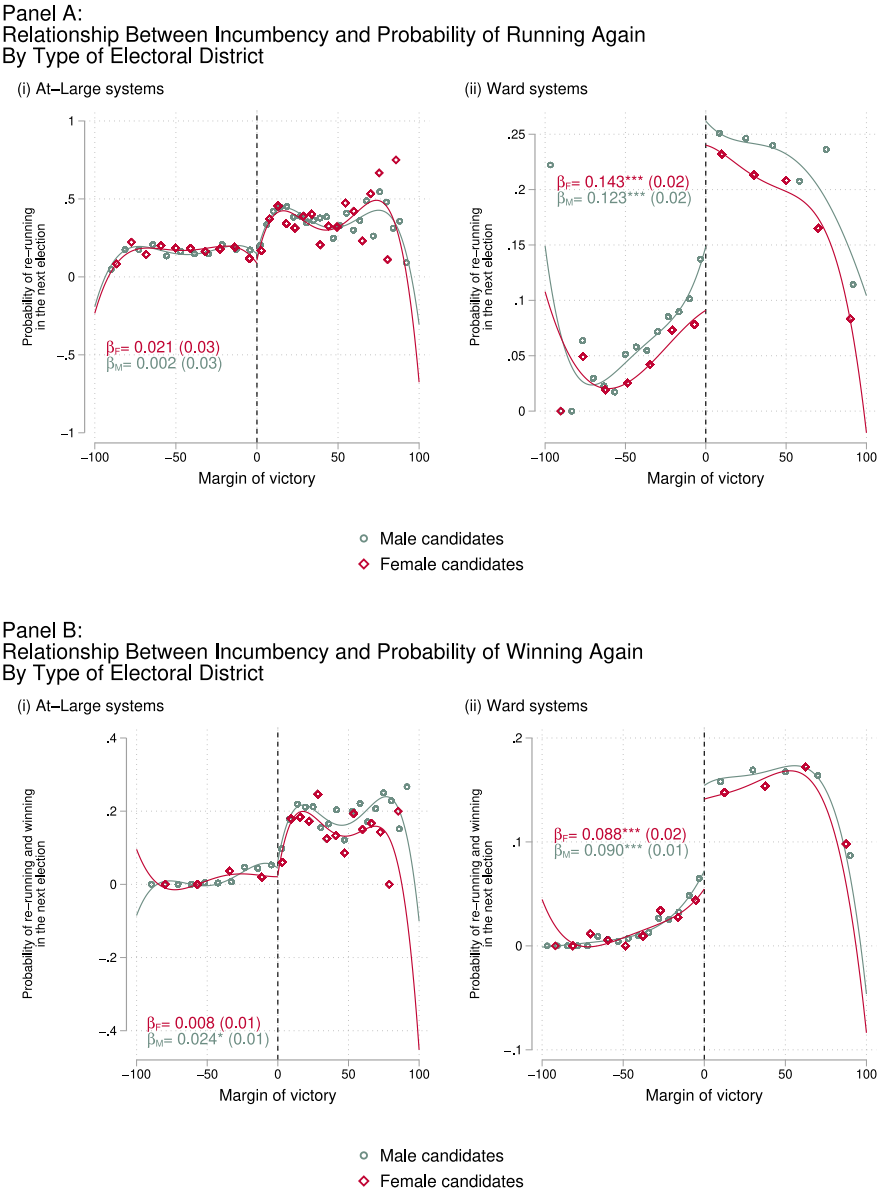
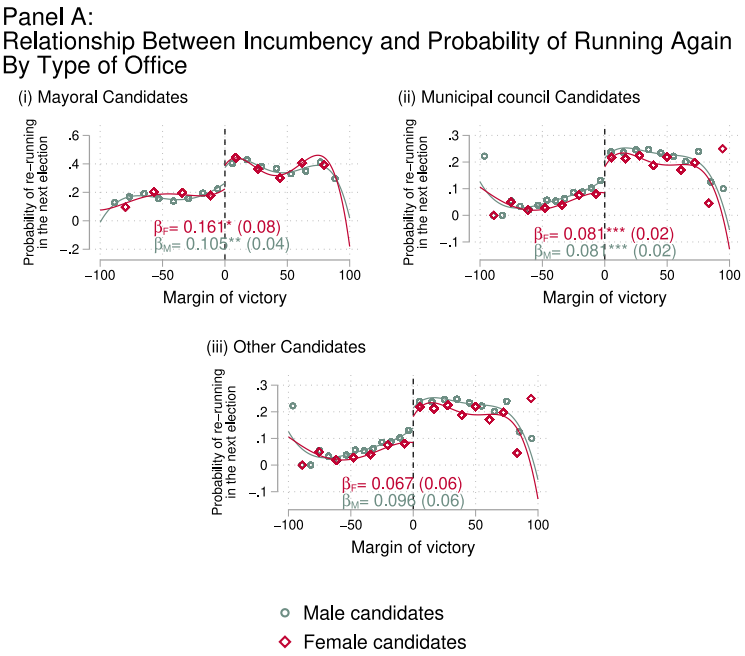


Fig. A.9. Relationship between incumbency advantage and downstream political outcomes, by gender and type of electoral district.
Note: This figure is a RD plot scatter of the probability of running again in the next election (panel A) and the probability of running in and winning the next election (panel B) against candidates' margin of victory in the initial election (on the *x*-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the winning threshold. In all panels, I plot RD plot scatters and include global polynomial fits separately for male and female candidates. Panels (i) and (ii) show effects for elections operating under at-large and ward systems, respectively.



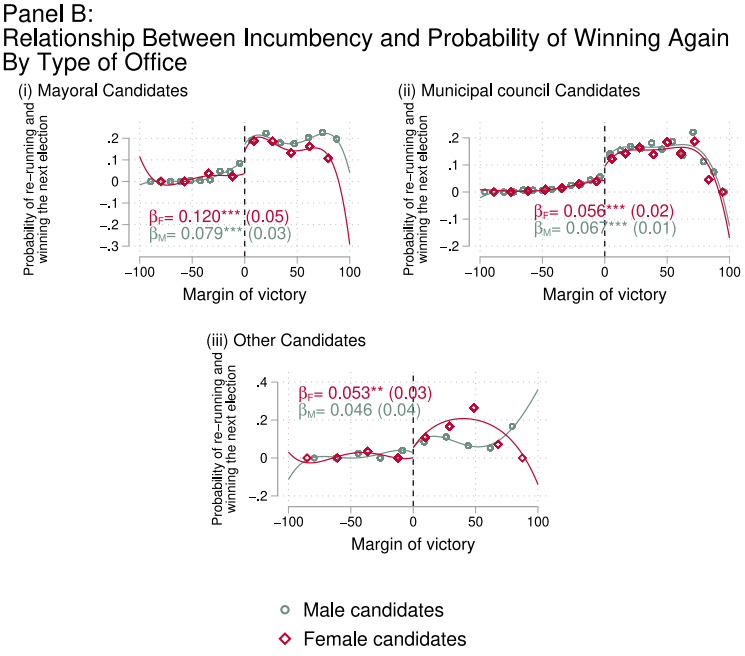


Fig. A.10. Relationship between incumbency advantage and downstream political outcomes, by gender and type of office.
Note: This figure is a RD plot scatter of the probability of running again in the next election (panel A) and the probability of running in and winning the next election (panel B) against candidates' margin of victory in the initial election (on the x-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the losing threshold. I plot RD plot scatters and include global polynomial fits separately for male and female candidates. Panels (i), (ii) and (iii) show effects for candidates running in mayoral, municipal council, and other races.

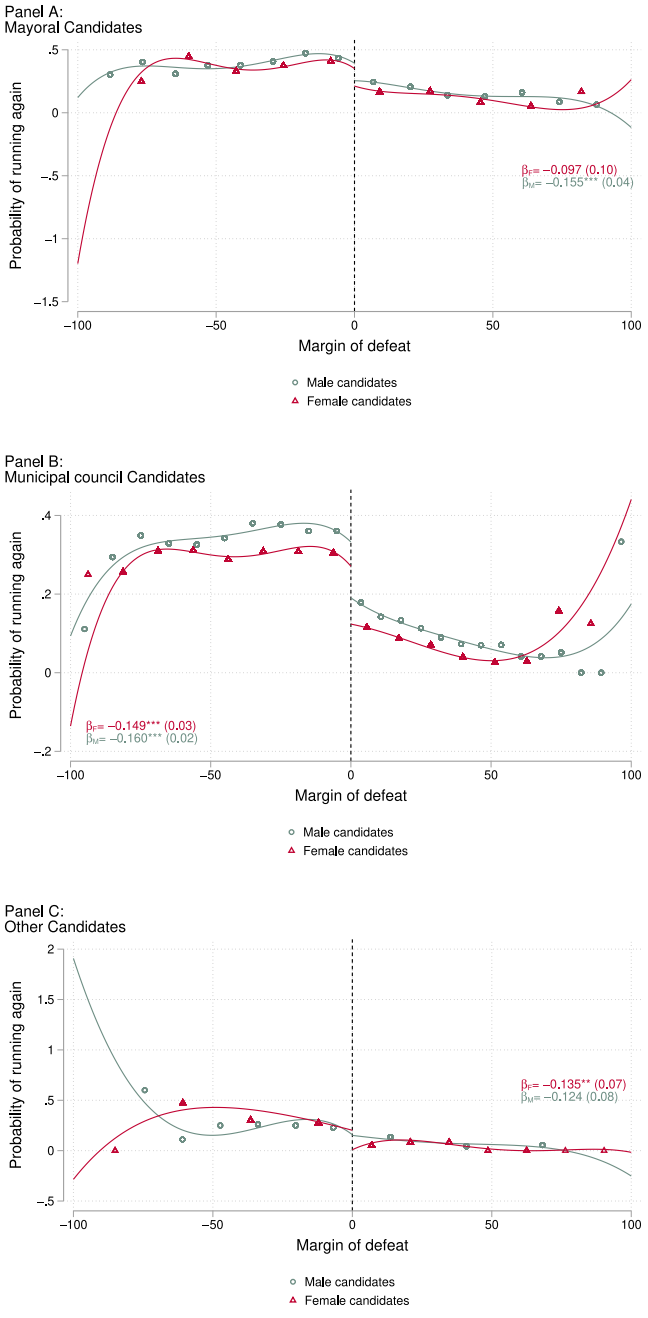


Fig. A.11. Relationship between margin of defeat and subsequent political participation, by gender and type of office.
Note: This figure is a RD plot scatter of the probability that candidates run again for office within the next two available opportunities (on the *y*-axis) against candidates' margin of defeat in the initial election (on the *x*-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the losing threshold. In all three panels, I plot RD plot scatters and include global polynomial fits separately for male and female candidates.

Table A.15
Effect of electoral loss on subsequent political participation, by type of office.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *Mayor*			
Lost	−0.157***	−0.196***	−0.188***	−0.145***
	(0.04)	(0.05)	(0.03)	(0.04)
Bandwidth	13.79	6.89	27.57	14.08/19.60
Observations	6,358	6,358	6,358	6,358
	ii. *Municipal council*			
Lost	−0.148***	−0.128***	−0.165***	−0.137***
	(0.03)	(0.03)	(0.02)	(0.02)
Bandwidth	13.03	6.52	26.07	10.14/18.51
Observations	32,931	32,931	32,931	32,931
	iii. *Other*			
Lost	−0.047	−0.071	−0.105	−0.056
	(0.06)	(0.08)	(0.06)	(0.07)
Bandwidth	12.37	6.18	24.73	11.21/19.21
Observations	682	682	682	682
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs again for office within the next two available opportunities of a given election. The independent variable is an indicator for whether the candidate lost their given election. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.16
Effect of incumbency on subsequent political participation, by type of office.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *Mayor*			
Incumbency	0.081	0.091	0.132***	0.122***
	(0.04)	(0.06)	(0.03)	(0.04)
Bandwidth	9.35	4.68	18.71	18.39/10.31
Observations	7,652	7,652	7,652	7,652
	ii. *Municipal council*			
Incumbency	0.076***	0.052*	0.096***	0.060**
	(0.02)	(0.02)	(0.02)	(0.02)
Bandwidth	10.83	5.41	21.66	20.44/7.61
Observations	36,674	36,674	36,674	36,674
	iii. *Other*			
Incumbency	0.078	0.083	0.085*	0.082*
	(0.04)	(0.05)	(0.04)	(0.04)
Bandwidth	17.88	8.94	35.76	17.24/21.61
Observations	1,144	1,144	1,144	1,144
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs in the immediate next election. The independent variable is an indicator for whether the candidate is the incumbent of the office they are running for. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.17
Effect of incumbency on subsequent political success, by type of office.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *Mayor*			
Incumbency	0.079**	0.136***	0.112***	0.108***
	(0.03)	(0.03)	(0.02)	(0.02)
Bandwidth	14.21	7.10	28.41	28.14/13.55
Observations	7,652	7,652	7,652	7,652
	ii. *Municipal council*			
Incumbency	0.058***	0.046**	0.068***	0.051***
	(0.01)	(0.02)	(0.01)	(0.01)
Bandwidth	10.65	5.32	21.29	20.32/8.49
Observations	36,674	36,674	36,674	36,674
	iii. *Other*			
Incumbency	0.028	0.029	0.045*	0.030
	(0.02)	(0.03)	(0.02)	(0.02)
Bandwidth	11.09	5.55	22.19	18.69/10.84
Observations	1,144	1,144	1,144	1,144
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs in the immediate next election and wins. The independent variable is an indicator for whether the candidate is the incumbent of the office they are running for. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

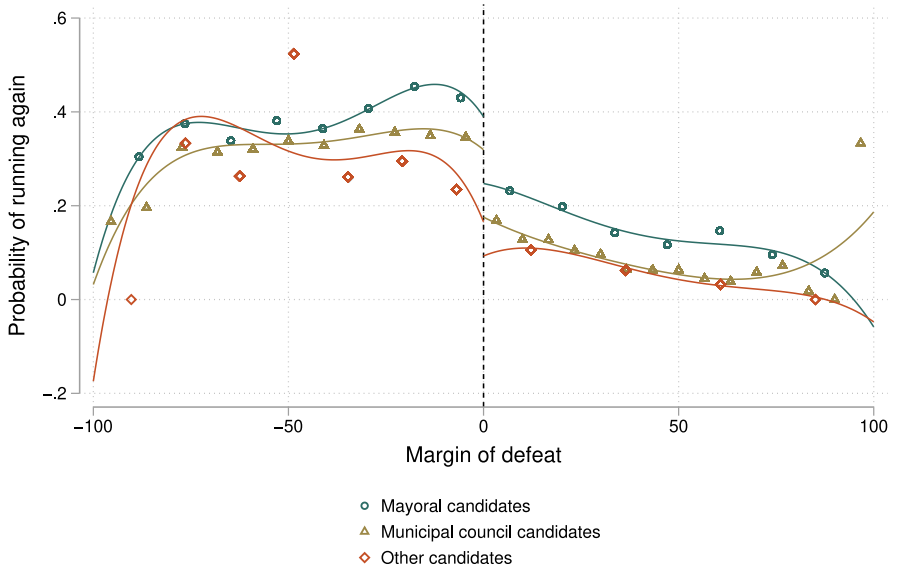


Fig. A.12. Relationship between margin of defeat and subsequent political participation, by type of office.
Note: This figure is a RD plot scatter of the probability that candidates run again for office within the next two available opportunities (on the *y*-axis) against candidates' margin of defeat in the initial election (on the *x*-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the losing threshold. I plot RD plot scatters and include global polynomial fits separately for mayoral, municipal council, and other candidates.

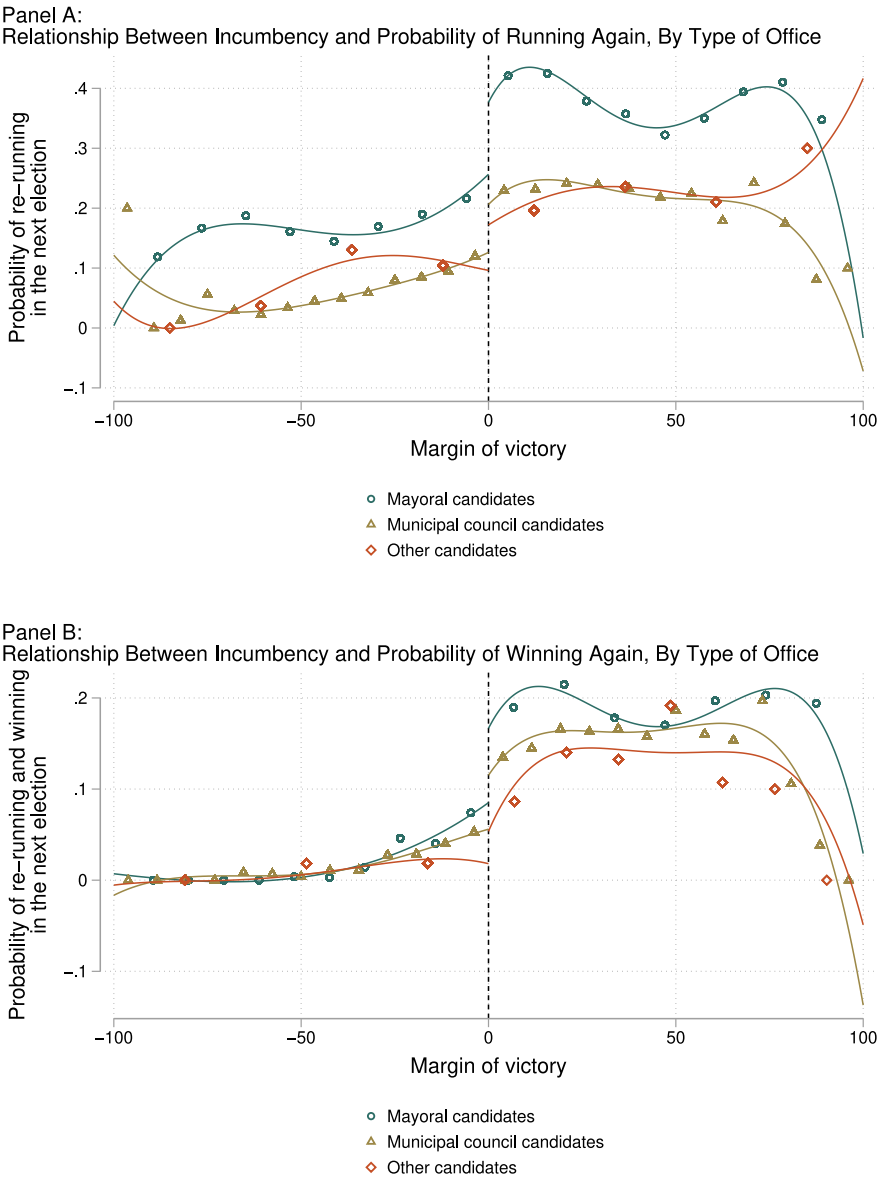


Fig. A.13. Relationship between incumbency advantage and downstream political outcomes, by type of office.
Note: This figure is a RD plot scatter of the probability of running again in the next election (panel A) and the probability of running in and winning the next election (panel B) against candidates' margin of victory in the initial election (on the x-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the winning threshold. I plot RD plot scatters and include global polynomial fits separately for mayoral, municipal council, and other candidates.

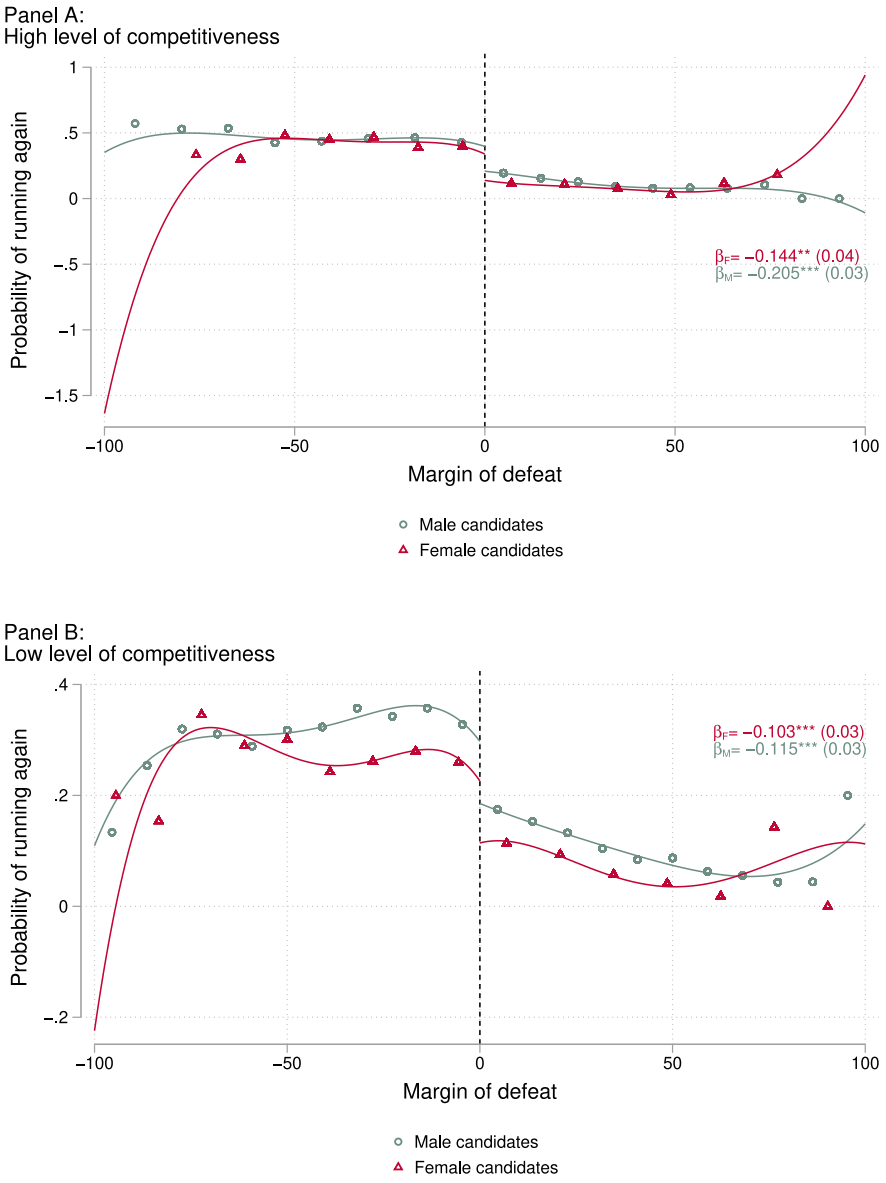


Fig. A.14. Relationship between margin of defeat and subsequent political participation, by gender and level of electoral competition.
Note: This figure is a RD plot scatter of the probability that candidates run again for office within the next two available opportunities (on the *y*-axis) against candidates' margin of defeat in the initial election (on the *x*-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the losing threshold. In both panels, I plot RD plot scatters and include global polynomial fits separately for male and female candidates.

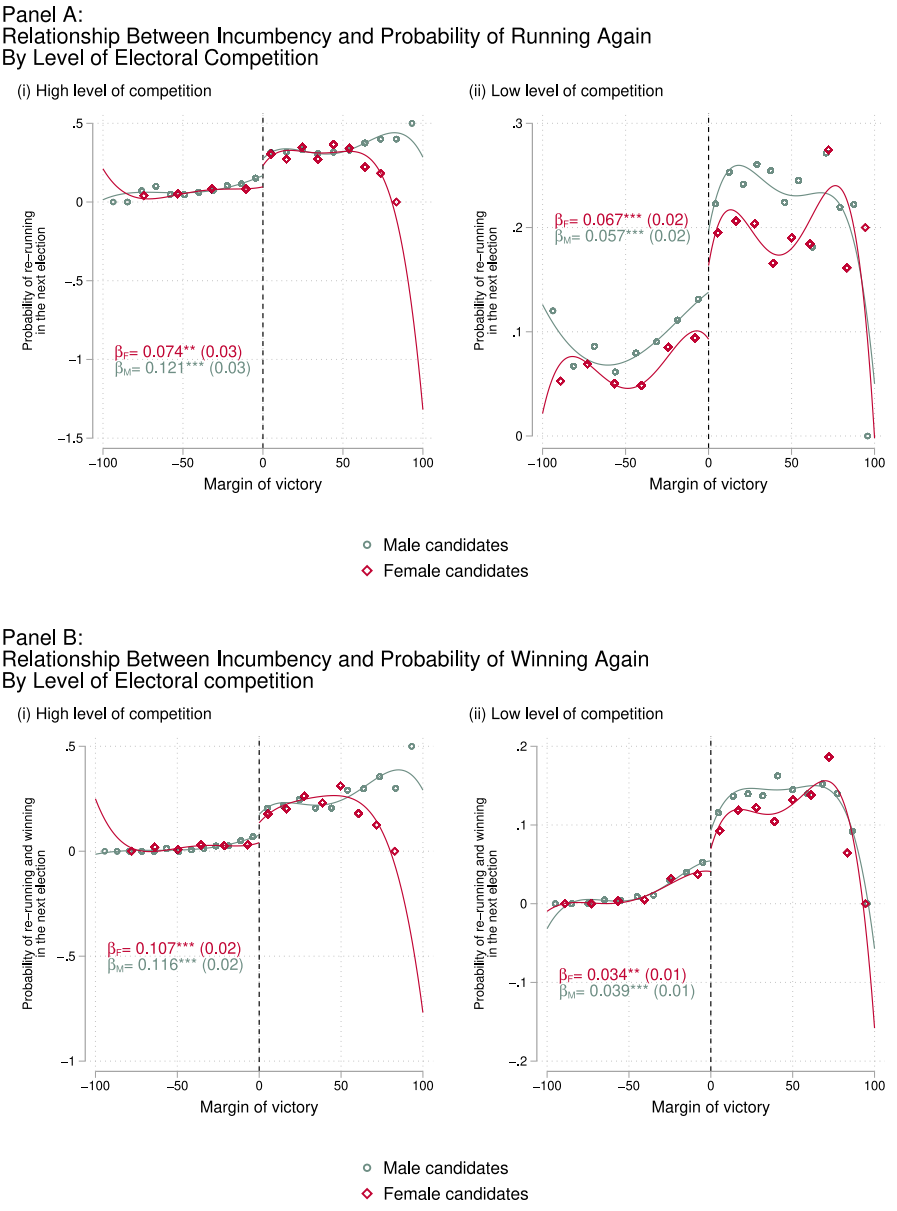


Fig. A.15. Relationship between incumbency advantage and downstream political outcomes, by gender and level of electoral competition.
Note: This figure is a RD plot scatter of the probability of running again in the next election (panel A) and the probability of running in and winning the next election (panel B) against candidates' margin of victory in the initial election (on the *x*-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the winning threshold. In all panels, I plot RD plot scatters and include global polynomial fits separately for male and female candidates. Panels (i) and (ii) show effects for election races with high and low level of electoral competition, respectively. Competitivity is measured as the ratio of the number of candidates in a given race for the number of seats available.

Table A.18
Effect of electoral loss on subsequent political participation, by level of electoral competition.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *High level of competition*			
Lost	−0.201***	−0.181***	−0.210***	−0.200***
	(0.03)	(0.04)	(0.02)	(0.03)
Bandwidth	13.42	6.71	26.84	12.29/19.52
Observations	12,498	12,498	12,498	12,498
	ii. *Low level of competition*			
Lost	−0.118***	−0.100***	−0.136***	−0.105***
	(0.02)	(0.02)	(0.02)	(0.02)
Bandwidth	12.05	6.03	24.10	9.99/23.53
Observations	27,473	27,473	27,473	27,473
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs again for office within the next two available opportunities of a given election. The independent variable is an indicator for whether the candidate lost their given election. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level. Competitivity is measured as the ratio of the number of candidates in a given race for the number of seats available.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.19
Effect of incumbency on subsequent political participation, by level of electoral competition.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *High level of competition*			
Incumbency	0.110***	0.088**	0.140***	0.108***
	(0.02)	(0.03)	(0.02)	(0.02)
Bandwidth	11.15	5.57	22.29	24.78/8.57
Observations	15,207	15,207	15,207	15,207
	ii. *Low level of competition*			
Incumbency	0.052***	0.042*	0.069***	0.048***
	(0.02)	(0.02)	(0.01)	(0.01)
Bandwidth	9.31	4.66	18.63	19.30/8.50
Observations	30,263	30,263	30,263	30,263
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs in the immediate next election. The independent variable is an indicator for whether the candidate is the incumbent of the office they are running for. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level. Competitivity is measured as the ratio of the number of candidates in a given race for the number of seats available.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.20
Effect of incumbency on subsequent political success, by level of electoral competition.

	(1) MSE optimal bw	(2) 0.5 × Optimal bw	(3) 2 × Optimal bw	(4) Diff optimal bw
	i. *High level of competition*			
Incumbency	0.119***	0.103***	0.117***	0.118***
	(0.02)	(0.02)	(0.02)	(0.02)
Bandwidth	14.63	7.32	29.27	18.13/15.20
Observations	15,207	15,207	15,207	15,207
	ii. *Low level of competition*			
Incumbency	0.036***	0.023	0.043***	0.027**
	(0.01)	(0.01)	(0.01)	(0.01)
Bandwidth	10.21	5.11	20.43	16.28/9.16
Observations	30,263	30,263	30,263	30,263
Election year fixed effects	X	X	X	X
Municipality fixed effects	X	X	X	X
Type of office fixed effects	X	X	X	X

Note: This table presents the results of the estimation of a specification with the dependent variable whether a candidate runs in the immediate next election and wins. The independent variable is an indicator for whether the candidate is the incumbent of the office they are running for. When the bandwidth is allowed to be different above and below the cut-off, it is reported as left bandwidth/right bandwidth. Standard errors are clustered at the municipality-by-type of office level. Competitivity is measured as the ratio of the number of candidates in a given race for the number of seats available.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

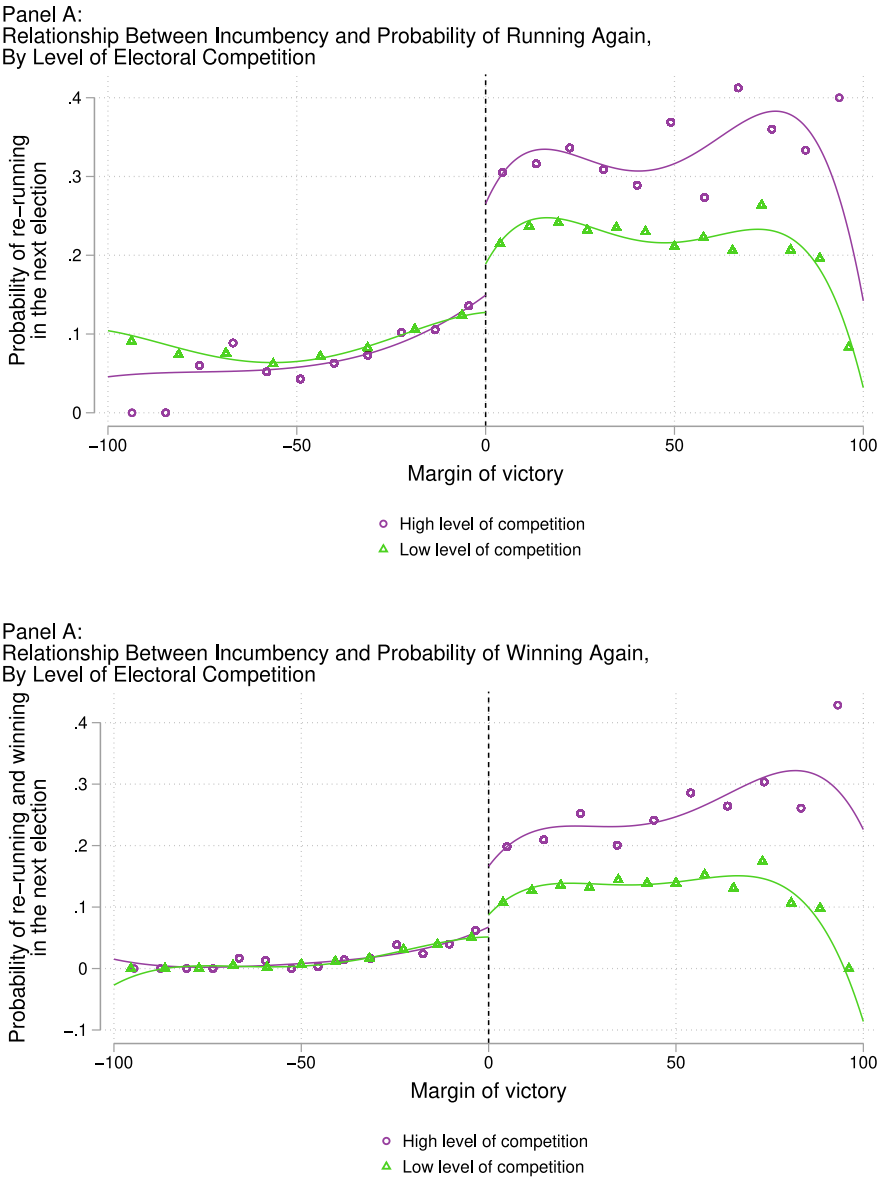


Fig. A.16. Relationship between incumbency advantage and downstream political outcomes, by level of electoral competition.
Note: This figure is a RD plot scatter of the probability of running again in the next election (panel A) and the probability of running in and winning the next election (panel B) against candidates' margin of victory in the initial election (on the x-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the winning threshold. I plot RD plot scatters and include global polynomial fits separately for election races with a high and a low level of electoral competition. Competitivity is measured as the ratio of the number of candidates in a given race for the number of seats available.

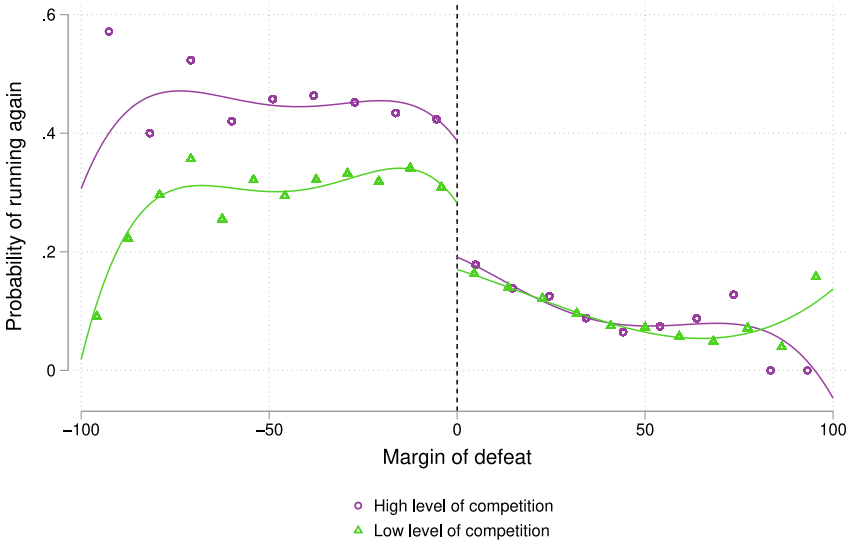


Fig. A.17. Relationship between margin of defeat and subsequent political participation, by level of electoral competition.
Note: This figure is a RD plot scatter of the probability that candidates run again for office within the next two available opportunities (on the *y*-axis) against candidates' margin of defeat in the initial election (on the *x*-axis), for quantile-spaced bins. A global polynomial fit is plotted on either side of the losing threshold. I plot RD plot scatters and include global polynomial fits separately for election races with a high and a low level of electoral competition. Competitivity is measured as the ratio of the number of candidates in a given race for the number of seats available.

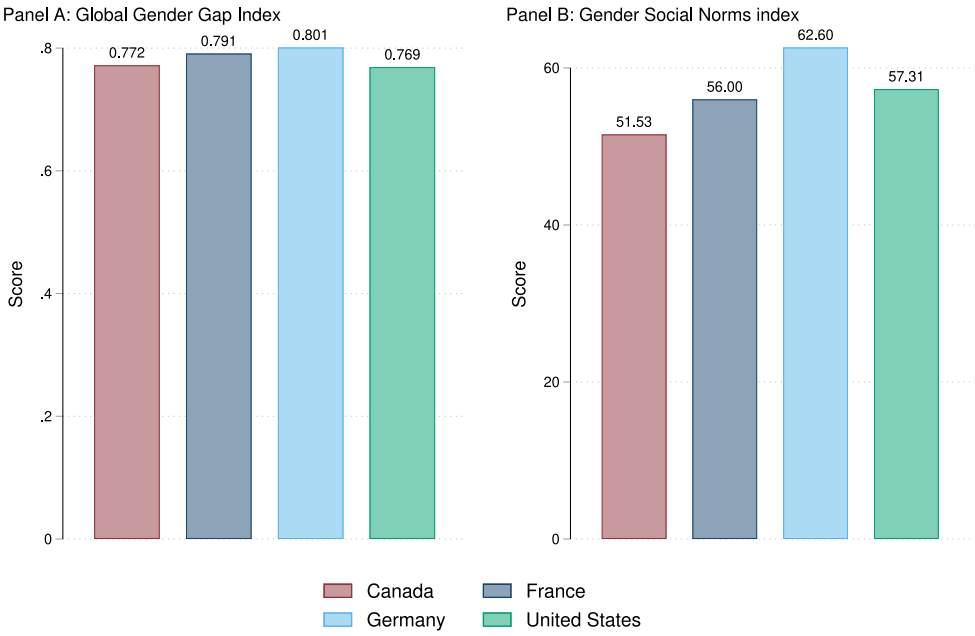


Fig. A.18. Gender attitudes indices.
Note: This figure presents country scores for the Gender Social Norms Index (GSNI) and the Global Gender Gap Index. The GSNI, an index introduced by the United Nations Development Programme (UNDP), measures how social beliefs obstruct gender equality in areas like politics, work, and education. The estimate is to be interpreted as the proportion of surveyed individuals in a country who show at least one clear bias against gender equality. The Global Gender Gap Index can be interpreted as the distance covered towards parity (i.e. the percentage of the gender gap that has been closed).

References

Anzia, Sarah F., Berry, Christopher R., 2011. The Jackie (and Jill) Robinson effect: Why do congresswomen outperform congressmen? Am. J. Political Sci. 55 (3), 478–493.

Ashworth, Scott, Berry, Christopher R, de Mesquita, Ethan Bueno, 2020. Sources of women's underrepresentation in US politics: A model of election aversion and voter discrimination. In: Working Paper.

Baskaran, Thushyanthan, Hessami, Zohal, 2018. Does the election of a female leader clear the way for more women in politics? Am. Econ. J. Econ Policy 10 (3), 95–121.

Baskaran, Thushyanthan, Hessami, Zohal, 2022. The gender recontest gap in elections. Eur. Econ. Rev. 145, 104111.

Baskaran, Thushyanthan, Hessami, Zohal, Khasanboev, Temurbek, 2022. Political selection when uncertainty is high. Kyklos.

Bauer, Nichole M., 2020. Shifting standards: How voters evaluate the qualifications of female and male candidates. J. Polit. 82 (1), 1–12.

Beaman, Lori, Chattopadhyay, Raghabendra, Duflo, Esther, Pande, Rohini, Topalova, Petia, 2009. Powerful women: Does exposure reduce bias? Q. J. Econ. 124 (4), 1497–1540.

Beaman, Lori, Duflo, Esther, Pande, Rohini, Topalova, Petia, 2012. Female leadership raises aspirations and educational attainment for girls: A policy experiment in India. Science 335 (6068), 582–586.

Bernhard, Rachel, de Benedictis-Kessner, Justin, 2021. Men and women candidates are similarly persistent after losing elections. Proc. Natl. Acad. Sci. 118 (26), e2026726118.

Bhalotra, Sonia, Baskaran, Thushyanthan, Min, Brian, Uppal, Yogesh, 2018. Women legislators and economic performance. In: IZA Discussion Paper No. 11596.

Bhalotra, Sonia, Clots-Figueras, Irma, Iyer, Lakshmi, 2017. Pathbreakers? Women's electoral success and future political participation. Econ. J. 128 (613), 1844–1878.

Bherer, Laurence, Breux, Sandra, 2011. Les partis politiques municipaux sont nécessaires. https://www.lapresse.ca/debats/votre-opinion/201111/25/01-4471609-les-partis-politiques-municipaux-sont-necessaires.php.

Brown, Ryan, Mansour, Hani, O'Connell, Stephen D., 2022. Does local female political representation empower women to run for higher office? Evidence from state and national legislatures in India. World Bank Econ. Rev. 36 (1), 198–218.

Brown, Ryan, Mansour, Hani, O'Connell, Stephen D., Reeves, James, 2019. Gender differences in political career progression: Evidence from US elections. In: CESifo Working Paper.

Burrell, Barbara, 1992. Women candidates in open-seat primaries for the U. S. House: 1968–1990. Legislative Stud. Q. 17 (4), 493–508.

Buser, Thomas, Yuan, Huaiping, 2019. Do women give up competing more easily? Evidence from the lab and the dutch math olympiad. Am. Econ. J. Appl. Econ. 11 (3), 225–252.

Calonico, Sebastian, Cattaneo, Matias D., Farrell, Max H., Titiunik, Rocio, 2017. rdrobust: Software for regression-discontinuity designs. Stata J. 17 (2), 372–404.

Carter, Gwendolen M., 1956. The political role of women. By Maurice Duverger. (Paris: UNESCO. 1955. Pp. 221. Am. Political Sci. Rev. 50 (4), 1181.

Casas-Arce, Pablo, Saiz, Albert, 2015. Women and power: Unpopular, unwilling, or held back? J. Polit. Econ. 123 (3), 641–669.

Cattaneo, Matias D., Idrobo, Nicolás, Titiunik, Rocío, 2019. A Practical Introduction To Regression Discontinuity Designs: Foundations. Cambridge University Press.

Ceciarini, Sandra, 2019. Women in Politics: Local and European Trends. Technical Report, Council of European Municipalities and Regions (CEMR).

Chattopadhyay, Raghabendra, Duflo, Esther, 2004. Women as policy makers: Evidence from a randomized policy experiment in India. Econometrica 72 (5), 1409–1443, Copyright - Copyright Econometric Society Sep 2004; Document feature - tables; references; equations; Last updated - 2021-09-09; CODEN - ECMTA7; SubjectsTermNotLitGenreText - India.

Chiasson, Guy, Mévellec, Anne, 2014. The 2013 Quebec municipal elections. Can. J. Urban Res. 23 (2), 1–8.

Cipullo, Davide, 2021. Gender gaps in political careers: Evidence from competitive elections. In: CESifo Working Paper.

Crawford, Kenneth G., 1954. Canadian Municipal Government. University of Toronto Press.

Darcy, Robert, 1994. Women, Elections, and Representation, Vol. 1. U of Nebraska Press.

Dollar, David, Fisman, Raymond, Gatti, Roberta, 2001. Are women really the "fairer" sex? Corruption and women in government. J. Econ. Behav. Organ. 46 (4), 423–429.

Duflo, Esther, 2012. Women empowerment and economic development. J. Econ. Lit. 50 (4), 1051–1079.

Ellison, Glenn, Swanson, Ashley, 2018. Dynamics of the Gender Gap in High Math Achievement. National Bureau of Economic Research.

Fiva, Jon H., King, Max-Emil M., 2022. Child penalties in politics. In: CESifo Working Paper.

Folke, Olle, Rickne, Johanna, 2020. All the single ladies: Job promotions and the durability of marriage. Am. Econ. J. Appl. Econ. 12 (1), 260–287.

Gidengil, Elisabeth, Vengroff, Richard, 1997. Representational gains of Canadian women or token growth? The case of Quebec's municipal politics. Can. J. Political Sci./Revue Can. Sci. Politique 30 (3), 513–537.

Granzier, Riako, Pons, Vincent, Tricaud, Clémence, 2019. The Large Effects of a Small Win: How Past Rankings Shape the Behavior of Voters and Candidates. Technical Report, National Bureau of Economic Research.

Håkansson, Sandra, 2021. Do women pay a higher price for power? Gender bias in political violence in Sweden. J. Polit. 83 (2), 515–531.

Hessami, Zohal, Baskaran, Thushyanthan, 2019. Competitively elected women as policy makers. Available at SSRN 3517052.

Hessami, Zohal, da Fonseca, Mariana Lopes, 2020. Female political representation and substantive effects on policies: A literature review. Eur. J. Political Econ. 63, 101896.

Hogarth, Robin M., Karelaia, Natalia, Trujillo, Carlos Andrés, 2012. When should I quit? Gender differences in exiting competitions. J. Econ. Behav. Organ. 83 (1), 136–150.

Kendall, Chad, Rekkas, Marie, 2012. Incumbency advantages in the Canadian Parliament. Can. J. Econ. Revue Can. d'écon. 45 (4), 1560–1585.

Kjaer, Ulrik, 2010. Women in politics - The local-national gender gap in comparative perspective. Politische Vierteljahresschrift 334–351.

Kushner, Joseph, Siegel, David, Stanwick, Hannah, 1997. Ontario municipal elections: Voting trends and determinants of electoral success in a Canadian province. Can. J. Political Sci./Revue Can. Sci. Politique 30 (3), 539–553.

Lawless, Jennifer L., Fox, Richard L., 2013. Girls just wanna not run. The gender gap in Young Americans' political ambition. Women Politics Inst.

Lee, David S., 2008. Randomized experiments from non-random selection in US house elections. J. Econometrics 142 (2), 675–697.

Lightbody, James, 2006. City Politics, Canada. University of Toronto Press.

Lippmann, Quentin, 2023. Persistence of incumbents and female access to political positions. J. Econ. Behav. Organ. 206, 327–349.

Lucas, Jack, 2021. The size and sources of municipal incumbency advantage in Canada. Urban Aff. Rev. 57 (2), 373–401.

Lucas, Jack, Merrill, Reed, Blidook, Kelly, Breux, Sandra, Conrad, Laura, Eidelman, Gabriel, Koop, Royce, Marciano, Daniella, Taylor, Zack, Vallette, Salomé, Horak, Martin, Gutzke, Amanda, 2020. Canadian Municipal Elections Database. Scholars Portal Dataverse.

Maillé, Chantal, 2015. Feminist interventions in political representation in the United States and Canada: Training programs and legal quotas. Eur. J. Am. Stud. 10 (10–1).

Marshall, John, 2022. Can close election regression discontinuity designs identify effects of winning politician characteristics? Am. J. Political Sci.

Matland, Richard E., Studlar, Donley T., 2004. Determinants of legislative turnover: a cross-national analysis. Br. J. Political Sci. 34 (1), 87–108.

Mévellec, Anne, Tremblay, Manon, 2013. Les partis politiques municipaux: La «westminsterisation» des villes du Québec? Recherches Sociographiques 54 (2), 325–347.

Moncrief, Gary F., 1998. Terminating the provincial career: Retirement and electoral defeat in Canadian provincial legislatures, 1960–1997. Can. J. Political Sci./Revue Can. Sci. Politique 31 (2), 359–372.
Muriaas, Ragnhild, Mazur, Amy G., Hoard, Season, 2022. Payments and penalties for democracy: gendered electoral financing in action worldwide. Am. Political Sci. Rev. 116 (2), 502–515.
Murray, Rainbow, 2014. Quotas for men: Reframing gender quotas as a means of improving representation for all. Am. Political Sci. Rev. 108 (3), 520–532.
Muyters, Gertjan, Put, Gert-Jan, Maddens, Bart, 2022. Gender bias in candidate turnover: A longitudinal analysis of legislative elections in Flanders/Belgium (1987–2019). Party Politics 28 (6), 1058–1068.
Niederle, Muriel, Vesterlund, Lise, 2007. Do women shy away from competition? Do men compete too much? Q. J. Econ. 122 (3), 1067–1101.
Pearson, Kathryn, McGhee, Eric, 2013. Should women win more often than men? The roots of electoral success and gender bias in U.S. house elections. SSRN Electron. J.
Peveri, Julieta, Sangnier, Marc, 2021. Gender differences in re-contesting decisions: New evidence from French municipal elections.
Profeta, Paola, Woodhouse, Eleanor F., 2022. Electoral rules, women's representation and the qualification of politicians. Comp. Political Stud. 55 (9), 1471–1500.
Sanbonmatsu, Kira, 2002. Political parties and the recruitment of women to state legislatures. J. Polit. 64 (3), 791–809.
Schlesinger, Joseph A., Schlesinger, Joseph Adolph, 1966. Ambition and Politics: Political Careers in the United States. Rand McNally.
Schwindt-Bayer, Leslie A., 2005. The incumbency disadvantage and women's election to legislative office. Elect. Stud. 24 (2), 227–244.
Sevi, Semra, 2022. Is incumbency advantage gendered? Legislative Stud. Q.
Smrek, Michal, 2020. Do female legislators benefit from incumbency advantage? Incumbent renomination in a flexible-list PR system. Elect. Stud. 66, 102189.
Status of Women Canada, 2018. 100th anniversary of women's first right to vote in Canada. https://cfc-swc.gc.ca/commemoration/cent/index-en.html. (Accessed 17 July 2022).
The Canadian Encyclopedia, 2022. School boards. https://www.thecanadianencyclopedia.ca/en/article/school-boards.
The World Bank, 2022. Population, female (% of total population). https://data.worldbank.org/indicator/SP.POP.TOTL.FE.ZS.
Tolley, Erin, 2011. Do women "do better" in municipal politics? Electoral representation across three levels of government. Can. J. Political Sci. 44 (3), 573–594.
Tremblay, Manon, 2014. Être candidates aux élections municipales et législatives: des courses de haies qui s'apparentent? Can. J. Urban Res. 23 (2), 38–58.
UN Women, 2021. Facts and figures: Women's leadership and political participation. https://www.unwomen.org/en/what-we-do/leadership-and-political-participation/facts-and-figures.
UNDP, 2020. 2020 Gender Social Norms Index (GSNI). Technical Report, UNDP (United Nations Development Programme).
Wasserman, Melanie, 2021. Gender differences in politician persistence. Rev. Econ. Stat. 1–46.
White, Graham, 2013. In the presence of northern aboriginal women. In: Trimble, Linda, Arscott, Jane, Tremblay, Manon (Eds.), Stalled: The Representation of Women in Canadian Governments. UBC Press, Vancouver, CANADA, pp. 233–252.
World Economic Forum, 2022. Global Gender Gap Report 2022: Insight Report. Technical Report, World Economic Forum.
Young, Lisa, 1991. Legislative turnover and the election of women to the Canadian house of commons. In: Megyery, Kathy (Ed.), Women in Canadian Politics: Volume 6: Toward Equity in Representation. Dundurn, Toronto, pp. 81–99.