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Electoral gender quotas in post-communist societies: Evidence from Polish municipalities

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Abstract: This thesis examines the short-term effects of a legislative gender quota in candidate lists using evidence from local elections in Poland. In the context of open lists systems, quotas were introduced in 2018 in municipalities with proportional representation (over 20,000 inhabitants). Municipalities with less than 20,000 inhabitants employed single-district majority systems and therefore the quota was not applied. Using a Discontinuity-in-Differences (Disc-in-Diff) design, I find that the quota increased the share of women in candidate lists by 12 p.p. However, I do not find any significant change in the share of female councilors or on the composition of municipal councils in terms of age, political experience and education. My analysis suggest that the Polish quota failed to increase female presence in local decision-making bodies, presumably because females were placed at the bottom of the candidate lists.

Keywords: Electoral gender quotas, local politics, discontinuity-in-differences, Poland
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1 Introduction

Women's equal participation and leadership in political and public life is an essential target for achieving the fifth Sustainable Development Goal[1] by 2030 (United Nations, 2021). Still, women are underrepresented at all levels in the political sphere. Less than one quarter of all national parliamentarians are women. In local governments, women constitute on average 36 percent of elected members (UN Women, 2021). The slow speed by which the number of women in politics is growing has called for constitutional change. One such action is electoral gender quotas that emerged in a handful of countries in the 1970's and grew in popularity during the first decade of the 21st century (Krook, 2014). Today, more than 130 countries worldwide have adopted gender quotas by voluntary party rules or legislation mandated by constitution or electoral law (Childs & Hughes, 2018).

The past decade has seen a rapid expansion of scholars examining the effects of electoral gender quotas. Because quotas can transform the composition of governing bodies, their potential impact is wide-ranging. Electoral quotas have been shown to influence the electoral success of women, the quality of politicians, political engagement and public policy (see e.g. Bagues & Campa, 2021; Baltrunaite et al., 2014; Besley et al., 2017; Chattopadhyay & Duflo, 2004; Lippmann et al., 2020). The impact of a quota policy is, however, determined by the specific institutional context in which it is applied, including the type of political system and the cultural attitudes towards the role of women in society (International IDEA, 2013). In order to achieve a comprehensive understanding of the workings of electoral gender quotas, researchers have aimed to build a network of country and region specific studies. To this day, there is relatively little empirical evidence on the effects of electoral gender quotas in the post-communist region. Measuring the effects of quotas in this region is interesting for a variety of reasons. On the one hand, the communist system was characterized by formal equality in political participation, education and employment (Malgorzata Fidelis, 2004). On the other hand, women in the former Soviet region have long faced significant barriers to political leadership and a traditional vision of the woman's role within the family, causing the formation of a number of women's grassroots movements (Zarnowska, 2004). This thesis aims to contribute to the existing research field by adding to the relatively scarce literature on electoral gender quotas in the context of local-decision making bodies in post-communist countries. More specifically, I exploit a quasi-experimental setting in Poland where almost no research has been done at municipality level.

Poland was one of the first countries to grant women electoral rights: in 1918, women's suffrage was received and one year later 70 percent of the female electorate voted, and the first woman entered the Sejm[2] (Leszczawski-Schwerk, 2018; Zarnowska, 2004). Polish women were also one of the first to gain access to economic spheres. In postwar Poland, the Communist

[1] Sustainable Development Goal no. 5: Achieve gender equality and empower all women and girls. Target 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life. Indicator 5.5.1: Proportion of seats held by women in national parliaments and local governments. Source: United Nations.

[2] The Sejm is the lower house of the parliament and the Senate composes the upper house.

government mobilized women to participate in industrial labor as women's inclusion was central to build a society free of inequalities (Malgorzata Fidelis, 2004). Indeed, Polish women were also expected to maintain their reproduction and responsibilities in the home. Despite formal access to political and economics spheres, they faced significant barriers to political leadership. Under the Communist rule, women gained 23 percent in the parliament but were absent from the decision-making bodies of the ruling political party (Leszczawski-Schwerk, 2018). After the fall of the Communist state in 1989, the new Constitution of the Republic of Poland (1997) guaranteed equal rights for women and men in all spheres of life. One decade later, women were still underrepresented at all levels in Polish politics (Śledzińska-Simon & Bodnar, 2013). In 2011, pressure by a women's activist association on the Polish parliament led to the adoption of a gender quota law in elections for the national parliament, European parliament and municipal councils. The legislation stipulated that each candidate list running for office should have at least 35 percent women. The quota law did not include rules about the ranking order of women - an instrument which is often used to prevent women from being placed in the bottom of the candidate lists (Dahlerup, 2009).

Evidence from western countries would predict that a gender quota without placement rules should have limited impact on the success of females in politics. However, the distinct history and political dynamics of post-communist countries may lead to different reactions to an introduction of a gender quota policy. In the context of Polish municipal elections, I aim to estimate the causal short-term impact of the gender quota on female representation in candidate lists and the composition of municipal councils. Several aspects of the electoral system at local level makes it an appropriate setting. First of all, I am able to exploit the fact that the electoral gender quota was only applied in municipalities with more than 20,000 inhabitants. Second, since the quota was legislated at national level, it could be seen as an exogenous shock to the electoral system at local level. To estimate the effect of the quota policy, I use a Regression Discontinuity framework that allows me to compare outcomes in municipalities slightly above and below the threshold of 20,000 inhabitants. The underlying assumption for this empirical strategy is that municipalities close to the threshold are comparable in the sense that no other relevant variables, except form the quota policy, change discontinuously at the threshold. However, to study the effects of the gender quota reform on electoral outcomes, I need to consider a second policy that changes sharply at the threshold of 20,000 inhabitants, namely the type of electoral system. Specifically, municipalities above the threshold use proportional representation systems, while municipalities below the threshold employ plurality voting in single-member districts. In order to overcome this identification problem, I adopt a so-called Discontinuity-in-Differences design (Disc-in-Diff) that rests on the intuition of combining a Difference-in-Difference strategy (DiD) with a Regression Discontinuity Design (RDD). In other words, I combine two sources of variation: municipalities just above/below the cutoff of 20,000 inhabitants and the change in policy over time. Through the use of the Disc-in-Diff method, I strive to isolate the effect of the Polish quota policy from the type of electoral system that change at the 20,000 inhabitants's threshold.

The main source for my panel data is administrative electoral data from the National Electoral Commission of Poland. The dataset includes every candidate list running for office in Polish municipal elections for the election cycles of 2006, 2010, 2014 and 2018. It also includes a number of candidates characteristics as well as election results in terms of the number of votes cast for a given candidate and a variable stating whether the candidate was elected to council or not. The electoral data is merged with population data, which constitutes the basis for the application of the quota law and the type of electoral system. To study the effect of the quota policy, I consider outcome variables for the composition of candidate lists and municipal councils. Outcomes at candidate level include variables for the share female candidates, and characteristics of candidates in terms of age and political experience. Outcomes at council level include variables for the share of female councilors, and characteristics in terms of age, political experience and education.

I estimate the Disc-in-Diff equation using a local linear approach with mean squared optimal bandwidths. In other words, I run linear regressions successively in a narrow window of almost each point, within a sample consisting of observations lying in a certain neighborhood of the threshold. I present four types of results for each outcome variable. First, I make an exploratory data analysis by running RD plots, using second order polynomial regressions fitted separately on each side of the threshold. These graphical analyses provide information of a potentially existing discontinuity. Second, the result of each outcome variable is discussed from a Disc-in-Diff approach. Third, I run the Disc-in-Diff regressions for the pre-treatment period to check that municipalities just below and above the cutoff were not on differential trends before the policy shift. Lastly, I show that the estimates are stable to a number of robustness checks and sensitivity tests. I find that the quota policy increased the percentage of female candidates running for office by 12 percentage points (p.p.). However, I fail to show that quotas increased the share of females in municipal councils. Neither do I observe any significant evidence of a change in the composition of municipal councils when it comes to age, political experience or education. By studying the positioning of females on ballots, I observe that females where placed at the bottom of the lists. I suggest this as a possible mechanism for the ineffectiveness of the quota. Overall, my analysis indicates that the Polish quota failed to increase female presence in local decision-making bodies, presumably because the quota law did not include placement mandates.

This thesis is structured as follows. Section 2 reviews previous literature and provides motivation for how this thesis aims to contribute to the research field. Section 3 describes the institutional setting of Polish municipalities, the history of local governance and women's role in politics. Section 4 outlines the data and Section 5 explains the empirical strategy. Section 6 presents the results, discussions are found in Section 7 and Section 8 concludes.

2 Literature review

2.1 Electoral gender quotas and female representation in politics

During the first decade of the 21st century, electoral gender quotas grew in popularity as means to increase female representation in the political sphere (Krook, 2014). The core idea with electoral gender quotas is to secure a certain share of women in political bodies, either by requiring a minimum share of female candidates in lists running for office or by reserving seats for women in governments, assemblies or councils (International IDEA, 2013). While quotas in candidate lists may be voluntarily introduced by political parties, almost 60 countries have adopted legislative candidate quotas, mandated by constitutional or electoral law. In general, quota laws impose a minimum requirement of 30 to 40 percent females per list, together with sanctions against parties that do not comply with the minimum requirement[3] (ACE Electoral Knowledge Network, 2021). In addition to this, candidate quota regulations may differ in regards to the ranking order of candidates. For instance, Spain has adopted a legislative candidate quota that requires parties to include not only 40 percent women on every candidate list, but also to each group of five candidates. This concept is called placement mandates, or sometimes a "double quota", and aims to prevent women from being systematically allocated at the bottom of the lists (Dahlerup, 2009).

The past two decades have seen a rapid expansion of qualitative literature on the implementation of gender quotas and the electoral success of women (Krook, 2014). There are also a number of econometric studies examining the effects of gender quotas. Several of these papers have documented the impact of gender quotas on female representation in politics. De Paola et al. (2010) use a DiD design to estimate effects of the 1993 Italian gender reform on women's representation and involvement in politics. They find that the gender quota law, stipulating a maximum of two-thirds of either gender on candidate lists in municipal elections, increased women's presence in municipal councils by 7 p.p. The authors further conclude that even after the gender quota law was abolished in 1995, the increase in the proportion of women in politics persisted. Baltrunaite et al. (2019) exploit a discontinuity in the application of a more recent Italian gender quota law[4], prescribing both gender quotas on candidate lists and double preference voting conditioned on gender in municipal elections. Using a population threshold of 5,000 inhabitants, the authors estimate that the gender quota reform increased the share of female politicians in municipal councils by 18 p.p. Bagues and Campa (2021) study the Spanish gender quota, stipulating a minimum requirement of 40 percent of either gender in every group of five positions on candidate lists in municipal elections. Using a RDD, the authors estimate that the gender quota increased the share of female candidates by 8 p.p. and the share of female council members by 4 p.p.

[3] The most common legal sanctions for non-compliance is rejection of the candidate list or financial penalties.
[4] Passed in 2012.

2.2 Barriers to women's electoral success

Despite the popularity of electoral gender quotas as policy instruments, their value is still a debated topic. On the one hand, quotas may serve as strategies for getting past parties that act as gatekeepers by not putting women forward as candidates (see e.g. Kunovich & Paxton, 2005). On the other hand, an increase in the pool of female candidates is not a guarantee for women's electoral success. For instance, gender stereotypes in society and politics can lead to voter bias against female candidates (Beaman et al., 2009; Valdini, 2013). Moreover, a common criticism of candidate quotas is that they fail to promote women into leadership positions. Bagues and Campa (2021) conclude that while the Spanish gender quota increased females in municipal councils, it failed to promote women into powerful positions. Lassébie (2020) finds similar evidence from studying the introduction of a gender quota law in French municipalities. While the quota law had substantial impact on the share of female candidates and elected politicians, it failed to promote female mayors and list leaders in the long run. Although existing literature emphasize that increased female participation in politics and public offices spawn role models for women who may decide to run, and further improves attitudes towards women in politics (see e.g. Beaman et al., 2012; Gilardi, 2015), empirical evidence also proves the existence of a "glass ceiling" in the political sphere, hindering elected women to access top positions (Folke & Rickne, 2016).

Whether quotas succeed to empower women in politics or not is determined by the specific context in which they are applied, including the nature of the political system, the design of the quota and cultural attitudes towards the role of women in society (International IDEA, 2013). There is, however, some consensus in the literature about characteristics of the electoral system that work in favor of candidate quotas and women's electoral success. Proportional representation (PR) systems in combination with closed list systems seem to be beneficial to increasing the number of elected women (see e.g. Jones, 2009; Krook, 2018). PR systems are often associated with several candidates per list and a large district magnitude, making it less costly for parties to nominate additional women. When quotas are applied in closed list PR systems, voters can neither select nor exclude specific candidates (Valdini, 2013). From analyzing the Chilean gender quota, Jones and Navia (1999) conclude that the adoption of quotas in open-list PR systems can lead to a positive effect on the share of women elected, however not as much as when lists are closed. Irrespective of electoral system, however, existing evidence agrees on the importance of designing quota laws such that they leave no room for parties to circumvent them (see e.g. Bagues & Campa, 2021; Freidenvall & Dahlerup, 2013). Schmidt (2009) finds that the most effective variable for increasing the share of elected women in PR systems is placement mandates. When there are no placement mandates included in the quota law, there is a risk that women are systematically allocated at the bottom of the lists. Indeed, studies by Esteve-Volart and Bagues (2012) and Thomas and Bodet (2013) show that parties are more likely to nominate female candidates for positions that has little chance to win.

2.3 Gender quotas and characteristics of politicians

This thesis also relates to the literature on the selection of candidates and on the characteristics of elected politicians. One of the main arguments against gender quotas is that they violate the principle of meritocracy, and opponents commonly fear that the enforcement of women into the pool of candidates will lead to a decline in the quality of elected politicians. Looking to the existing empirical evidence, however, this fear seems to be unrealized. Besley et al. (2017) develop a measure of competence based on an individual's earnings, relative to other people with similar characteristics and experience, to study how the competence of politicians was affected by the introduction of a voluntary gender quota in Sweden's largest political party (the Social Democrats). The authors find that the gender quota, requiring parties to alternate between men and women on the candidate list, increased the competence of politicians, especially among men. Besley et al. (2017) conclude that the key driver of their results is that men with mediocre competence were resigned from candidate lists in order to leave room for more competent women. Baltrunaite et al. (2014) exploit the 1993 Italian quota reform to analyze its effects on the quality of elected politicians. They find that the introduction of gender quotas led to an increase in the education-level of elected politicians and conclude that their results are driven by the increase in female politicians, who were on average more educated than men, and by the lower number of low-educated men. In the Spanish context, Bagues and Campa (2021) find no significant evidence in either direction when it comes to educational attainment. They do find, however, a negative impact on the political experience of candidates in the short run. The authors argue that this effect is almost mechanical as gender quotas require parties to increase the share of an otherwise outnumbered group. In the long run, however, this effect is insignificant as women gained more experience. Other studies find that the introduction of gender quotas reduced the average age of candidates (see e.g. Bird, 2003). In the context of Argentinian sub-national elections, Barnes and Holman (2020) conclude that quotas increased the diversity in terms of professional experience and personal characteristics of elected council members.

Yet again, the impact of gender quotas on the characteristics of political bodies, the selection process of politicians or the share of women elected, is likely to depend on the specific institutional context in which they are applied. Thus, more evidence is needed to achieve a comprehensive understanding of the workings of electoral gender quotas. In the following sections, this thesis aims to contribute to the literature by providing empirical evidence from local elections in Polish municipalities.

3 Institutional framework

3.1 Poland's three-tier structure of local governance

Poland's democratic institutions took root at the groundbreaking parliamentary elections of 1989 when the victory of the Solidarity opposition paved the way to an end of the communist rule (Bloom, 2013). The election represented a fundamental change to the Polish society and the following years were spent in dialogue about the new character of the nation. On April 2, 1997, consensus about the new Constitution of the Republic of Poland was reached (Sejm of the Republic of Poland, 1997). The new constitution guaranteed a wide range of civil rights, built on western legal practice. Since its adoption, the 1997 Constitution has remained the base to the Polish political system[5].

Under the new Constitution, several changes were made to the local electoral system with the aim to decentralize and localize public power. The largest and most important administrative reform was the so called three-tier structure (see e.g. Hardy, 2004; Sześciło & Kulesza, 2012). Since 1999, the local government of Poland is organized at three tiers: voivodeships (regions), powiats (counties) and gminas (municipalities). Each tier has a self-governing nature and is regulated by distinct national legislation[6]. The largest units of administration, voivodeships, categorize Poland into 16 separate divisions. The voivodship takes care of all regional matters such as economic development, tourism and infrastructure. Each voivodship is then split into a number of smaller zones called powiats. Due to the fact that the large majority of public matters are handled by either municipalities or regions, the responsibilities of powiats are relatively limited. However, some of them include education at high-school level, public transport and parts of the health care system.

The basic local government unit is the municipality, or gmina, which is the focus of this thesis. The gmina is not only the oldest tier but also the most important; it takes care of a majority of the local needs and receives most of the decentralized spending. These responsibilities include health care, local infrastructure, culture, social welfare and education Council of Europe (2019). As laid down in the 1997 Constitution, an important factor for decentralizing public power was the self-governing nature of Polish municipalities, which goes under the Law on Municipal Self-Government (1990). The law implies that neither regions nor counties can influence the decision-making of Polish municipalities in any way. Since the implementation of the 1997 Constitution, Polish municipalities perform their tasks through own decision-making bodies. Their incomes consists of own revenues as well as general subsidies.

As of today, there are 2,477 municipalities in Poland. As shown in Table 1, a gmina may be classed as urban (consisting of a town or city), urban-rural (consisting of a town together with its surrounding villages and countryside), or rural (not containing a town). In general,

[5] Only two amendments have been made ever since, in 2006 and 2009 (concerning decisions about convicted Polish citizens such as the possibility to transfer a convicted person for trial or detention and the prohibition from being elected to the Sejm or Senate). Source: the Chancellery of the President of Poland.

[6] Act on Regional Self-Government (Dz.U. 1998 nr 91 poz. 576), Act on County Self-Government (Dz.U. 1998 br 91 poz. 578) and Act on Municipal Self-Government from (Dz.U. 1990 nr 16 poz. 95).

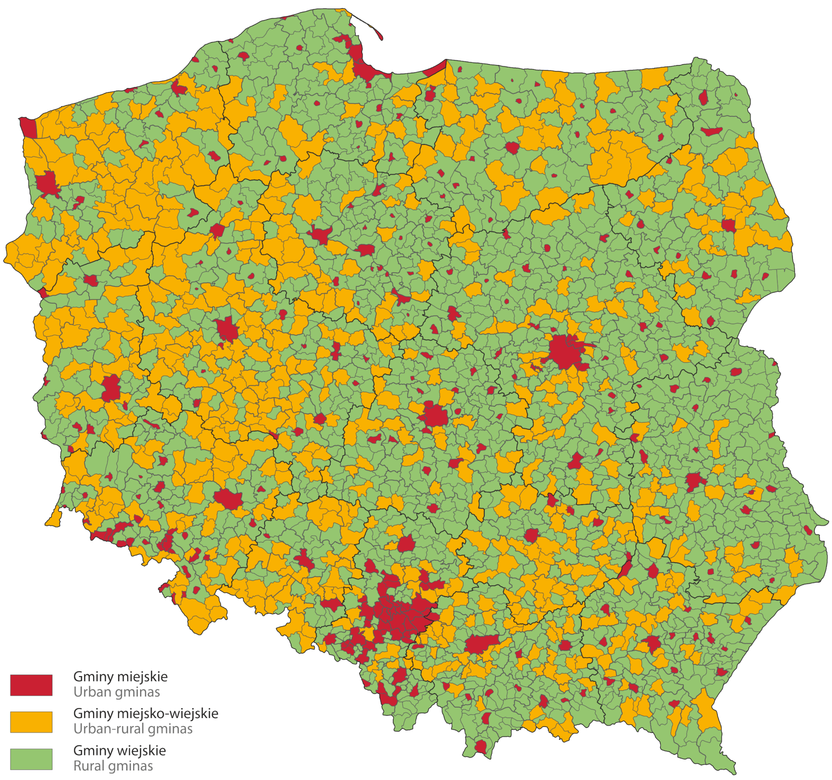
between 3 to 19 gminas make up one powiat. Some of the biggest gminas, however, may also be referred to "cities with powiat rights", which entails that they both have municipal and county authority. In other words, these gminas handles both municipal- and county matters. Due to the fact that those organs have larger autonomy than regular gminas, they will be excluded from my analysis. Moreover, organs of the capital city Warsaw are specifically regulated by another law than regular municipalities. Thus, the 18 city districts of the capital will also be excluded from my analysis.

Table 1: Administrative divisions of Poland

	Frequency	**Mean inhabitants**	**Stnd.dev**	**Min**	**Max**
Voivodeship	16	2398911	1281023	982626	5423168
Powiat	314	82185	44681	19914	399272
Gmina	2477	15496	51226	1286	1790658
Cities with powiat status	66	190553	253653	35719	1790658
Urban gminas	236	24957	17469	1286	73139
Urban-rural gminas	638	14146	9810	1636	85226
Rural gminas	1537	7086	4310	1484	33838

Notes: Own compilation of data from Statistics Poland, Local Data Bank.

Figure 1: Territorial division of Polish municipalities



Notes: Types of gminas in Poland according to the TERYT register as of January 1 2020. Source: TERYT, Statistics Poland.

3.2 Municipal elections

In Poland, the governmental decision-making body at municipal level is the municipal council, rada gminy (or in a town, rada miasta). Municipal councils are composed of members directly elected by the local residents through an open list system. This means that voters express their preference for specific candidates belonging to an electoral committee, on secret ballots. Since the first free local elections in 1990, members of municipal councils are elected every four years.[7] There are no term limits for municipal councilors[8].

During the first years of transition from the communist rule, regulations regarding the local electoral system were constantly undergoing change. In the context of the new Constitution of 1997, the parliament of Poland had finally accepted an Act on Elections to Municipal Councils in July 1998. The new regulations strengthened the local electoral system through legislative procedures for municipal elections. One of the rules that were initiated in this act states that candidates running for municipal councils need to be supported by an electoral committee. The committee may be formed by a political party, association or social organization. It may also be established by a group of voters (minimum of five). The function of the electoral committee is to nominate candidates for councilors and conduct electoral campaigns for them. A further development of the regulation was made in 2002 with the introduction of direct elections of mayors. Hence, for the 2002 local election, Poland had launched fundamental rules and legislation for the operation and election of both municipal legislative and executive bodies.[9] These new regulations entailed that Poland was divided into two different local electoral systems based on a population threshold of 20,000 inhabitants, as measured on December 31 the year before election. For the municipal general elections, a plurality system was introduced in municipalities with up to 20,000 inhabitants, while a proportional representation system was implemented in municipalities with 20,000 inhabitants or more. Figure 2 provides an overview of the electoral system at local level in Poland. Until 2014, the population threshold of 20,000 inhabitants resulted in 266 municipalities using the proportional representation system and 2,145 municipalities using plurality voting. The population threshold was removed in 2014 as a result of a revision in the electoral law[10]. While the 66 largest municipalities with county status kept the proportional representation system, the remaining municipalities employed plurality voting. In 2018, the threshold of 20,000 inhabitants was back in place together with the electoral systems that prevailed before 2014.

3.2.1 First-Past-the-Post vs. Proportional Representation

In municipalities below 20,000 inhabitants, councilors are elected in single-member districts through plurality voting, commonly known as a First-Past-the-Post system (FPTP). In the

[7]Municipal elections have been held in 1990, 1994, 1998, 2002, 2006, 2010, 2014 and 2018. Since 2018, councils are elected to five-year terms.

[8]In 2018, Poland introduced a limit of two terms for mayors and commune heads. The restrictions will be applied for the first time in local elections of 2028.

[9]Act on Elections to Municipal Councils (1998), Act on Indirect elections of town and village mayors and presidents (2002).

[10]Act of 5 January 2011, Electoral Code, Journal of Laws 2011.

context of FPTP systems, single-member district entails that municipalities are divided into a number of constituencies, from which only one councilor is elected. Electoral committees running for office are allowed to register one candidate per constituency, and voters may cast only one vote for one candidate[11]. Consequently, if a municipality has fifteen constituencies, there will be fifteen members in the municipal council. In accordance with the plurality rule, the winning candidate in each constituency is simply the person who wins the most votes. Until the elections of 2014, however, municipalities in rural areas had the opportunity to combine constituencies to form a multi-member constituency, if it was necessary to maintain a uniform standard of representation[12]. In the multi-member constituencies, electoral committees running for office were allowed to register as many candidates as there were seats to be filled. Likewise, voters of a multi-member constituency could cast as many votes as there were seats to be filled. The electoral regulations prescribed that the district magnitude, i.e., the number of councillors elected from a given multi-member constituency, could not be more than five.

In municipalities with 20,000 inhabitants or more, councilors are elected by proportional representation. In PR systems, voters express their preference for a specific electoral committee by selecting the committee's ballot. Hence, voters of a given constituency may vote for several candidates, but only if they belong to the same list. According to the electoral regulations, the district magnitude of constituencies differs between 5 to 8 councilors. Electoral committees running for office may submit only one list of candidates in each constituency, which may not contain less than 5 names of candidates and may not exceed twice the number of councilors elected in a given constituency[13]. Individuals can only stand as candidates in one constituency and from one list of candidates. Since 2002, the number of seats obtained by each electoral committee in a given constituency is allocated according to the d'Hondt law[14]. Thus, seats are divided among the electoral committees in proportion to the total number of votes that their candidates receive. Once the number of seats per committee is determined, they are awarded to the specific candidates who obtained the most votes. If two candidates obtain the same number of votes, the seat is awarded to the candidate that had the highest ranking on the list.

Table 2 summarizes the institutional differences between the two systems. In municipalities below 20,000 inhabitants, with a FPTP system in place, municipal councils consists of 15 members. In municipalities with proportional representation, the council size is 21. Another difference between the two systems is the number of signatures that is needed in order to be allowed to register a candidate list. In municipalities below 20,000 inhabitants, electoral committees need to gather signatures from at least 25 voters supporting the list. In municipalities with more than 20,000 inhabitants, 150 signatures is the minimum requirement for

[11] Act of July 16, 1998 - Electoral Ordinance to commune councils (Journal of Laws No. 95, item 602).

[12] According to the electoral law, a uniform standard of representation is calculated by dividing the number of inhabitants of the municipality by the total number of councilors elected to a given council.

[13] Act of July 16, 1998, Poland's National Electoral Office.

[14] In simple terms, the d'Hondt method allocate seats according to the following procedure: after all the valid votes have been counted, quotients are calculated for each electoral committee. The electoral committee with the largest quotient wins one seat, and then the quotients are recalculated. This procedure is repeated until all the seats are filled.

the registration of candidate list. The electoral law also impose regulations regarding the financing of electoral campaigns. Committees running for office in municipalities below the threshold have an expenditure limit of 750 Polish złoty (PLN) per election campaign. Above the threshold, committees must stay below the limit of 1000 PLN per election campaign.

Table 2: Institutional features

	<20,000 inhabitants	>20,000 inhabitants
Electoral system	FPTP	OLPR
Rules for allocating seats	Plurality	d'Hondt
Council size	15	21
Elected councilors per constituency	1 to 5	5 to 8
No. of candidates per list	1 to 5	5 to 16
Min. signatures per list	25	150
Limit to campaign financing	750PLN	1000PLN

Notes: FPTP stands for First-Past-the-Post, OLPR stands for Open List Proportional Representation. Source: Act of July 16, 1998 - Electoral Ordinance to commune councils, poviat councils and voivodship assemblies(Journal of Laws No. 95, item 602).

3.3 Gender equality and the Polish quota

On October 22, 2020, tens of thousands of demonstrators filled the streets across Poland to protest against the ruling Law and Justice[15] party's enforcement of a near-total ban on abortion (Pronczuk, 2020). This was not the first time Polish citizens organized women's strikes to demand gender equality. Poland has a long history of women's grassroots movements in political, economic and social spheres, formed in reaction to the traditional vision of the woman's role within the family and the low level of women's participation in power (Fuchs, 2013; Fuszara, 2005). In 2009, the Polish Congress of Women, a non-governmental organization with the mission to ensure equal rights and opportunities for both genders in the political and social sphere, was established as a reaction to the lack of progress of women's rights (Śledzińska-Simon & Bodnar, 2013). The Congress of Women prepared a citizen's bill, demanding gender equality in political elections through a parity rule of 50 percent women in candidate lists. The bill was met with divided opinions. Proponents argued that a parity rule was necessary to help women overcome barriers in the political sphere. Opponents argued it would result in individuals of lower competence holding power. Traditional views of differences in the roles of women and men and the importance of family status of women were also focal points among the objectors. The ruling party Civic Platform[16] abided the bill with an amendment to replace the parity rule (50:50) with a 35 percent quota for female candidates. A handful of male members of the parliament still voted against the bill, but it was not enough to turn it down (Dahlerup et al., 2011). In January 2011, the gender quota law was adopted by the Polish parliament and six months later it entered into force (Dubrow, 2011). The law imposed a

[15] Prawo i Sprawiedliwość, PiS.
[16] Platforma Obywatelska.

minimum share of 35 percent females on candidate lists and was applied to elections for the national parliament, the European parliament and municipal councils[17]. The new regulations also included binding sanctions for non-compliance, stating that lists that fall short to the minimum requirement shall be refused. The law did not include placement mandates, i.e. rules about the ranking order of females in candidate lists. (Dahlerup, 2009).

The Polish quota law was applied for the first time in the 2011 parliamentarian elections. In the context of local politics, quotas were introduced in municipalities with proportional representation (over 20,000 inhabitants). Since elections in municipalities smaller than 20,000 inhabitants were based on single member districts, the quota was not applied[18]. In the 2014 municipal election, which was the first local election since the law enforcement, the quota was applied in the 66 largest municipalities only. This was due to the fact that the threshold of 20,000 inhabitants was removed for the 2014 election, leading to that all regular municipalities employed FPTP systems. As demonstrated in Figure 2, the threshold was back in place in 2018, along with the introduction of the gender quota. From studying the gender quota law in the context of Polish parliamentarian elections, Gwiazda (2017) concludes that while the overall number of women increased almost twofold in comparison with the pre-quota period, it led to only a slight increase in the share of elected women. Jankowski and Marcinkiewicz (2019) conclude, that the list placement was more important for the electoral success of a candidate than the candidate's gender. While females were nominated to less favourable positions on lists, they also observed an increase at semi-favourable positions, leading to a slight increase in elected women. The authors further highlight the significant variation among individual parties, showing that liberal parties promoted women to a higher degree. While these studies do not directly assess the casual mechanisms of the gender quota at national level (due to the lack of a control group), they may give an indication of the workings of the Polish gender quota. Whether these results hold at local level, however, remains to be seen in this thesis.

Figure 2: Local electoral system

Municipality Group	**Electoral system / Gender quota (YES/NO)**				**Number of municipalities**
	2006	**2010**	**2014**	**2018**	
<20,000	FPTP/NO	FPTP/NO	FPTP/NO	FPTP/NO	2145
>20,000	OLPR/NO	OLPR/NO	FPTP/NO	OLPR/YES	266
Cities with county status	OLPR/NO	OLPR/NO	OLPR/YES	OLPR/YES	66

Notes: FPTP stands for First-Past-the-Post, OLPR stands for Open List Proportional Representation.

[17] Act of 5 January 2011, Electoral Code, Journal of Laws 2011 No. 21, Item 112.

[18] It is not possible to apply candidate quotas within constituencies in FPTP systems when only one candidate is proposed per list. It is possible, however, to have gender quotas in FPTP systems when they are applied between constituencies. In these cases, parties must nominate female candidates in a certain number of constituencies. Source: ACE Electoral Knowledge Network (2021).

4 Data

4.1 Local election data

The main source for my panel data is administrative electoral data from the National Electoral Commission of Poland, which I received through the Polish organization CenEA (Centre for Economic Analysis). The National Electoral Commission was formed in 2001 and organizes and supervises elections in compliance with the electoral law. The dataset covers the local election cycles of 2006, 2010, 2014 and 2018. For each of the 2,477 municipalities, the data contains the municipality's name and identification number[19] as well as information on its belonging constituencies. Electoral committees running for office in a given constituency have a name, identification code and a variable for the type of committee[20]. Additionally, for each electoral committee in a given constituency, there is a candidate list which includes the first and last name of the candidate(s), their position on the list, the number of votes cast, and a variable stating if the candidate received the mandate. The candidate characteristics provided are sex and age. I further construct a proxy for political experience, which indicates if the candidate/councilor was present on the candidate list in the previous election. To minimize the risk of encountering politicians with the exact same name, I measure experience within a given electoral committee in a given municipality. The electoral data is merged with population data retrieved from the National Electoral Commission[21]. Population records are based on the number of residents in a given municipality, as measured on December 31 the year before election. In accordance with the electoral acts, this constitutes the basis for determining the electoral system as well as the number of elected councilors in a given municipality.

4.2 Candidates running for office

Panel A in Table 3 presents summary statistics for electoral data on candidate level, before quotas were introduced. In municipalities below 20,000 inhabitants, there were on average 7.5 electoral committees competing for council mandates, compared to 6.4 in municipalities above 20,000 inhabitants. A majority of the electoral committees in municipalities below the threshold were formed by associations or individual voters (75 percent), hereby referred to as "independent committees", while others were formed on behalf of nation-wide parties (25 percent). In municipalities above the threshold, 56 percent of the committees were independent and 44 percent were formed on behalf of parties. The share of female candidates per municipality were on average 31 percent below the threshold and 32 percent above the threshold. While there was almost no difference in share of female candidates between the type of committees in municipalities above the threshold, independent committees had a larger share of female candidates (31 percent) than parties (26 percent) below the threshold. Looking to the characteristics of politicians, female and male candidates were on average 45 years old

[19] Identification numbers are administered by the TERYT administration. There have only been two changes in identification numbers since 2006. Those municipalities have been excluded from the dataset.

[20] Electoral committees may be established on behalf of parties, associations, social organizations or voters.

[21] Retrieved via email from National Electoral Commission (Krajowe Buiro Wyborzce).

before quotas were introduced. The share of candidates with political experience from the previous election differed greatly between female and male candidates. In municipalities below the threshold, 26 percent of the female candidates had political experience, compared to 40 percent among male candidates. In municipalities above the threshold, about one third of the male candidates had experience, corresponding to 13 p.p more experience than female candidates.

Table 5 in Appendix A presents additional summary statistics for electoral data on candidate level in municipalities with more than 20,000 inhabitants. In the context of proportional representation systems, candidates are ranked in priority order on candidate lists (determined by the electoral committee itself). I calculate the proportion of women in top and bottom positions. The presence of women is lowest in the first position (23 percent). Among positions in the upper half of the candidate list, women constitute on average 32 percent, compared to 34 percent in the bottom half of the list. Additionally, I calculate the share of candidate lists that would have satisfied the gender quota law if it was instead introduced in the 2010 local election. Table 5 shows that 38 percent of the candidate lists in municipalities with a proportional representation systems had more than 35 percent women before the quota was introduced.

4.3 Local councils

My electoral dataset includes both a variable for the number of votes cast for a given candidate and a variable indicating whether the candidate was elected to council or not. It further provides information on the name, age and gender of the candidates elected to council. Using the same method as described above, I create a measure for political experience among councilors. I further calculate the number of mandates per municipality and the district magnitude per constituency. The number of councilors in municipalities with PR systems is 21. In municipalities with FPTP systems, the council size is 15. Since I am interested in the effect of the electoral quota on local election results, I also construct a measure for female representation in councils. With additional council data from the Statistics Poland Local Data Bank, I am able to cross-check the share of female councilors per municipality. Moreover, from this data bank, I obtain supplementary data on the education level of council members.

Panel B in Table 3 presents summary statistics for municipal councils. On average, 4.4 electoral committees were represented in municipal councils below the threshold, as opposed to 4.7 above the threshold. Before the quota law was introduced, the share of female councilors was on average 26 percent in FPTP councils, compared to 22 percent in PR councils. Below the threshold, females represented a slightly larger share among councilors belonging to independent committees (26 percent), compared to nation-wide parties (18 percent). Above the threshold, females constituted on average 22 percent of party councilors and 21 percent of councilors belonging to an independent committee. Both female and male councilors were around 50 years old. The education level of councilors was notably lower in municipalities below the threshold of 20,000 inhabitants. In these municipalities, 29 percent had tertiary education, compared to 60 percent for councilors above the threshold. The share of councilors with political experience was also higher above the threshold. In these municipalities, 60 percent of the female councilors had experience from the past election, compared to 71 percent among male councilors. Below the threshold, the share of experienced politicians was 45 percent among female councilors and 58 percent among male councilors.

Table 3: Summary statistics - Electoral data

	Municipalities below 20,000 (FPTP system)	Municipalities above 20,000 (PR system)
Panel A. Candidates		
No. of committees running for office:		
All committees	7.5	6.4
Parties	1.9	2.8
Independents	5.6	3.6
Share of female candidates:		
All candidates	31%	32%
Among parties	26%	32%
Among independents	31%	31%
Age:		
All candidates	45.8	45.6
Female candidates	44.5	45.1
Male candidates	46.3	45.8
Experience:		
All candidates	36%	29%
Among female candidates	26%	20%
Among male candidates	40%	33%
Panel B. Municipal council		
No. of committees in council	4.4	4.7
No. of council members:		
Total council size	15	21
Party members	3.5	10.3
Independent members	11.5	10.7
Share of female councilors:		
All councilors	26%	22%
Among parties	18%	22%
Among independents	26%	21%
Tertiary Education	29%	60%
Age:		
All councilors	47.6	49.2
Female councilors	47.2	50.7
Male councilors	47.7	48.9
Experience:		
All councilors	55%	69%
Among female councilors	45%	60%
Among male councilors	58%	71%
Observations		
Number of electoral lists	72,428	7,457
Number of candidates	106,788	73,758
Number of municipalities	2,152	327

Notes: Each cell shows the average value per municipality in the pre-treatment period (2010). "Independents" stands for independent committees which include committees established by associations, voters or social organizations.

4.4 Data restrictions and limitations

As discussed in Section 3, the 66 largest municipalities, referred to as "cities with powiat rights", have more legislative power than regular municipalities due to their double autonomy status. Since the nomination and election of politicians in these municipalities could be driven by other mechanisms, I drop them from my sample. For the same reason, I drop the 18 organs of the capital city Warsaw that are specifically regulated by another law than regular municipalities[22]. This leaves me with a final sample of 2,365 municipalities from 2006 to 2018. Among them, 241 municipalities are treated after 2018 and 2,124 are in the control group.

Recalling Section 3.2.1, some constituencies in municipalities below 20,000 inhabitants were too small to maintain a uniform standard of representation and were therefore allowed to be combined into multi-member constituencies in the election periods of 2006 and 2010. During this period, a municipality below 20,000 inhabitants had on average 9.5 constituencies, where 3.2 out of these were multi-member constituencies. The existence of multi-member districts could pose a threat to the validity of my results if the characteristics of candidates in those districts differ from those in regular single-member constituencies. This is not very likely, however, since electoral committees that would otherwise register one candidate per constituency, could instead register those candidates in the same candidate list. Given that this assumption holds, the multi-member constituencies are not a threat to my analysis since my dependent variables are measured on municipality level. For instance, the share of female candidates within one municipality does not depend on the number of candidates within a given constituency, but rather on all candidates within the municipality. Suppose, however, that some electoral committees running for office in a multi-member constituency would otherwise only be present in one of the constituencies that were combined. Then, instead of proposing only one candidate, the electoral committee could register one or more extra candidates. This might lead to that females, within this electoral committee, have a higher chance of being put on the candidate list, and ultimately get elected. In order to minimize the possibility that the multi-member constituencies affect my results, I perform a robustness test in 6, where I include only municipalities which had a minority of multi-member constituencies (less than 25 percent).

[22] I further drop municipalities that have crossed the threshold of 20,000 inhabitants during my sample period. Lastly, I exclude one municipality, Zielona Góra, because of its merger with a city powiat that took place in 2014. Source: Polish Local Data Bank Center, Ośrodek Banku Danych Lokalnych.

5 Empirical strategy

In an ideal setting, it would be possible to examine the treatment effect of the electoral gender quota as the difference between the potential outcomes under treatment and control status. The fundamental problem of casual inference is, however, that the same municipality can never be observed under both treatment and control status (Rubin, 1974). In other words, the potential outcomes that would arise in municipalities above 20,000 inhabitants if the quota was never introduced will always be unobservable. To overcome this identification problem I employ a population-threshold RDD that compares outcomes in a sample of municipalities where one sub-sample is required to implement a given policy (the quota law), while another "identical-in-expectation" sub-sample is not. As demonstrated in previous sections, the institutional framework of local governance in Poland has the potential to provide an appropriate setting for identifying the causal impact of electoral gender quotas. First of all, I am able to exploit the fact that electoral gender quotas were only applied in municipalities with more than 20,000 inhabitants. Second, since the quota was legislated at national level, it could be seen as an exogenous shock to the electoral system at local level. However, in order to study the effects of the gender quota on electoral outcomes, I need to consider a second policy that changes sharply at the threshold of 20,000 inhabitants, namely the type of electoral system. As will be explained below, I therefore adopt a so-called Discontinuity-in-Differences approach, a research design that has emerged in the last couple of years as a possible solution in cases when there are multiple policies at the threshold. In the following section, I present my empirical framework, discuss the threats to its validity and explain how I address them with the use of a Disc-in-Diff approach.

5.1 RD framework

The application of the electoral gender quota policy to municipalities above a certain number of inhabitants suggests the use of an RD framework. Following e.g. Bagues and Campa (2021); Baltrunaite et al. (2019), I use a population threshold, at which the introduction of the gender quota law changes discontinuously, to identify my treatment effect. The population-threshold RDD allows me to compare treated municipalities that are slightly above the population threshold of 20,000 inhabitants, to control municipalities that are slightly below. In other words, it estimates the average outcome that treated municipalities just above the cutoff would have if they had not received the treatment. More specifically, I consider the the following equation:

$$Y_{i,2018} = \beta_0 + \beta_1 I[pop_{i,2017} > 0] + \beta_2 f pop_{i,2017} + \varepsilon_{i,t} \tag{1}$$

Where i is a municipality, polling district or an electoral list and Y_i is the outcome of interest. pop_i is the normalized population number of municipality i, based on the official population count of the municipality on the December 31 the year preceding election. In other words, pop_i measures the distance, h, between a municipality and the threshold of 20,000 inhabitants.

Formally, I restrict the sample to municipalities close to the threshold of 20,000 inhabitants in the interval $\forall pop_{it} \in (c-h, c+h)$. The coefficient β_1 identifies the effect of crossing the threshold c and β_2 identifies the slope of the regression function on both sides of the threshold. The RDD provides a consistent estimate of the impact of gender quotas, β_1, under the main assumption that municipalities close to the threshold do not exhibit any systematic differences, except from receiving the treatment. In the following section, I consider two potential violations of this assumption.

5.2 Validity of the RD framework

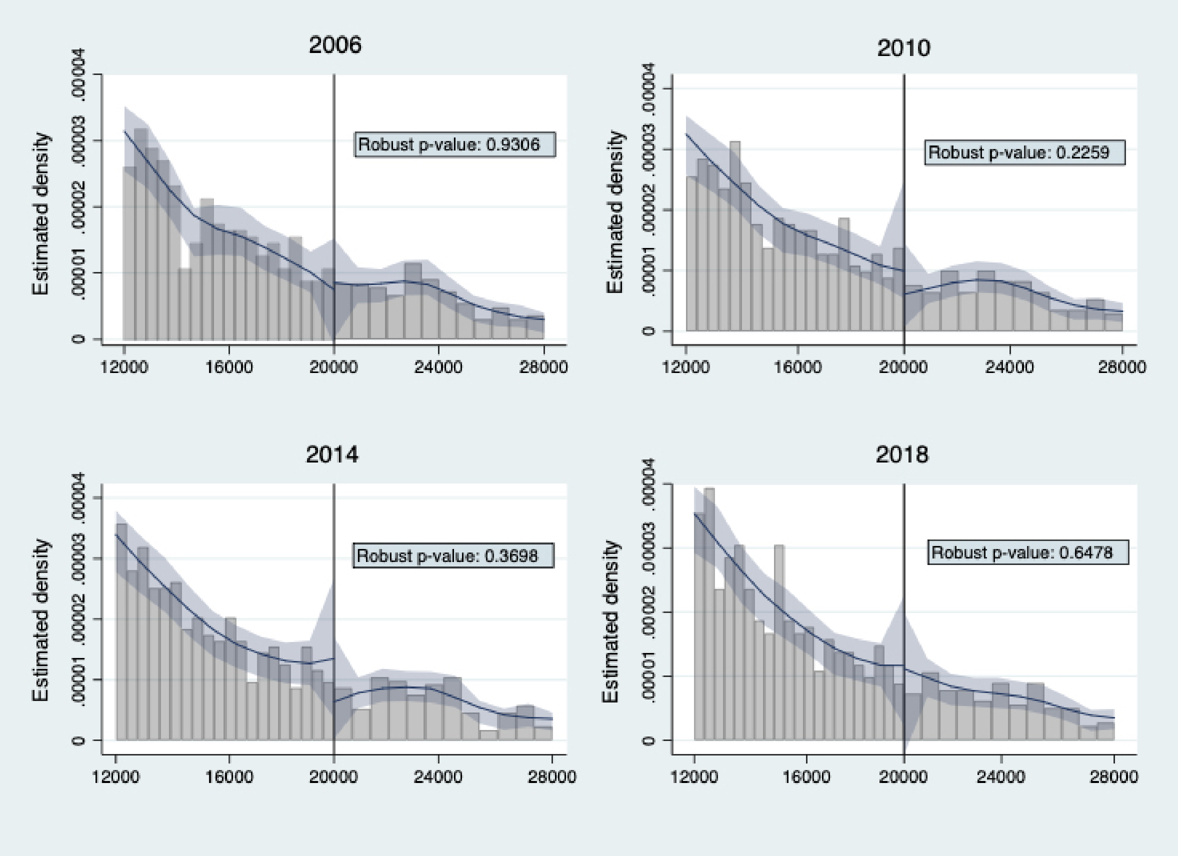
Over the past decades, the RD method has evolved to be one of the most reliable non-experimental research strategies when studying causal treatment effects on political and economic outcomes. There is, however, common pitfalls that arise in exploiting population-based policies. Eggers et al. (2018) propose two main threats to the validity of a population-threshold RDD. One of the pitfalls is the existence of strategic sorting around the threshold that may arise if municipalities want to fall on a desired side of the threshold. The other pitfall is the existence of multiple policies at the threshold. In the next two paragraphs I examine these main threats.

5.2.1 Strategic sorting around the threshold

If local authorities believe that they can benefit from, or avoid, the quota requirement, they might strategically manipulate their official population counts in order to fall on the desired side of the threshold. While it is rather unlikely that the gender quota alone induced manipulation around the threshold, there are other potential sources of manipulation. If municipalities strategically cross the threshold, and thereby avoid or adopt the quota legislation, they also need to change electoral system. Since there are both advantages and disadvantages with PR systems and FPTP systems, it is hard to predict the direction that a potential manipulation would go. On the one hand, a proportional representation system allows several candidates to run for office and minority committees have a higher chance of being represented in the council. On the other hand, small electoral committees might have a hard time fulfilling the requirements that comes with the electoral system above the threshold. For instance, electoral committees above the threshold must have at least 150 signatures from voters accepting the candidate lists, compared to 25 signatures in municipalities below the threshold.

If sorting prevails around the threshold, there is a substantial risk that municipalities on either side of the threshold have different unobservable characteristics, which would in turn bias my results. McCrary (2008) introduced the idea of manipulation testing in the context of RD designs by testing the null hypothesis of continuity for the density of the running variable. Cattaneo et al. (2018) build upon this idea by proposing a manipulation test based on a local-polynomial density estimator that does not require pre-binning of the data. Following Cattaneo et al. (2018), I run the "rddensity command" for elections in 2006, 2010, 2014 and 2018 at the 20,000 inhabitant's threshold. In Figure 3, I present histograms of the estimated density of the population variable around the threshold, using a triangular kernel and second-order polynomial. For each of these tests, I cannot reject the null hypothesis of continuity for the density of the running variable. Hence, I find no evidence of sorting on either side of the population threshold.

Figure 3: Density testing of the running variable



5.2.2 Confounding policies

To study the effects of the gender quota on electoral outcomes, I need to consider a second policy that changes sharply at the threshold of 20,000 inhabitants, specifically the type of electoral system. As demonstrated in Table 2, there are a handful of institutional features that differ between the two systems, including council size, district magnitude per constituency and rules for allocating seats. These differences could in turn impact the characteristics of candidates running for office. For instance, in FPTP systems, electoral committees will most likely go with the strongest candidate in a particular constituency since they are allowed to register one candidate per constituency and voters may cast only one vote for one candidate[23]. In PR systems, electoral committees may register twice as many candidates as there are council mandates in a particular constituency, making it less costly to nominate additional women. In addition, the number of signatures needed per candidate list and the limit to campaign financing may affect the characteristics of electoral committees running for office. Indeed,

[23]Except from in the multi-member constituencies where committees may propose 2-5 candidates.

the summary statistics found in Table 3 show that there is a larger share of nation-wide parties running for office above the threshold, as opposed to independent committees below the threshold.

To the best of my knowledge, no other policies except from those shown in Table 2 differ around the threshold. Nevertheless, these factors pose a threat to the validity of the RD framework since I am not able to disentangle the effect of the quota policy from the effect of having a particular electoral system. To address this problem, I could have evaluated the effect of these policies together, as a bundle, on my outcome variables. A more promising solution, however, is to adopt a Disc-in-Diff design. Below, I will explain how I mitigate the risk of bias with this approach.

5.3 Discontinuity-in-Differences design

This thesis aims to identify the short-term causal effect of the Polish gender quota on female representation in local politics. As described above, the RD estimator after 2018, defined as β_1, would identify the average treatment effect of the quota policy at the threshold - if it was the only treatment sharply changing at the threshold. In the Polish setting, however, the cross-sectional RD estimator provides a biased estimator of the treatment effect around the threshold, because of the change in electoral system. In order to overcome the identification problem, I adopt a Disc-in-Diff design. Through the use of this method, I strive to isolate the effect of the Polish quota policy from the type of electoral system that change at the 20,000 inhabitants threshold. This strategy was formally proposed by Grembi et al. (2016) in the context of evaluating fiscal constraints in Italian municipalities. The method has also been applied in gender quota research (see e.g. Bagues & Campa, 2021; Lassébie, 2020). Eggers et al. (2018) suggest that the Disc-in-Diff strategy is a credible approach to bypass issues with confounding policies that often arise in RRDs based on population thresholds. The idea with a Disc-in-Diff approach is to combine a DiD strategy and an RDD. In other words, it takes the RD coefficients in the post-treatment period, which would estimate the effect of the quota policy, electoral system and other confounding policies, and subtract the RD estimate in the pre-treatment period using the same population threshold. This is equivalent to running a DiD estimator around the cutoff. I follow the strategy used by Bagues and Campa (2021) and estimate the RD equation (1) with the dependent variable in differences. Consequently, I am able to rule out possible effects of the time-invariant policies around the threshold. More precisely, I estimate the following equation[24]:

$$\Delta_{2010}^{2018} Y_i = \beta_0 + \beta_1 I[pop_{i,2017} > 0] + \beta_2 f pop_{i,2017} + \varepsilon_{i,t} \tag{2}$$

[24]The motive behind measuring differences between the elections of 2018 and 2010 is that the threshold of 20,000 inhabitants was removed in 2014, leading to that all municipalities employed FPTP systems. In other words, comparing outcomes between 2014 and 2018 would not allow me to disentangle the effect of the quota policy from the change in electoral system. Possible limitations with this approach is discussed in Section 7.

Where i is a municipality, polling district or an electoral list and Y_i is the outcome of interest measured as the difference between the outcome in the post-quota election (2018) and the pre-quota election (2010). pop_i measures the distance to the population threshold of 20,000 inhabitants, normalized to zero (based on the official population count December 31 in 2017). The coefficient β_1 identifies the effect of crossing the threshold c (20,000 inhabitants). In other words, it measures the average treatment effect of the quota policy in a certain neighborhood of the threshold.

5.4 Assumptions

In the following paragraphs, I aim to verify the plausibility of three main assumptions that are crucial to the Disc-in-Diff design. To begin with, however, I evaluate another fundamental condition that has to be met in order for the Disc-in-Diff to provide consistent estimates, i.e. that assignment must predict treatment. This condition is fulfilled because the electoral law stipulates binding sanctions for non-compliance with the quota requirement. Specifically, lists that do not comply with the quota law are prohibited from participating in the election. As a double check, I count the number of lists in the treatment group that had less than 35 percent women in 2018. According to my dataset, only nine lists did not comply with the quota law, corresponding to 0.2 percent of my treatment sample. The share of female candidates in these lists were just a few percentage points lower than the quota requirement (28-33 percent). Because these lists compose a very small share of the sample, in combination with the fact that they belong to small municipalities far from the threshold, they should not be a threat to the validity of my results.

5.4.1 Continuity assumption

All variables potentially affecting outcomes on female representation, that was determined prior to the introduction of the gender quota (except from the type of electoral system), should be continuous at the threshold. I run several covariate balance tests to check that local randomization is given. In Appendix A, Figure 9, RD plots can be found for a number of demographic variables at municipality level[25]. For instance, the share of young people in a municipality could potentially affect the cultural attitudes towards women in politics, and ultimately the probability of electing a woman for office. Another variable that could impact the characteristics of the candidates running for office, and the probability of voting for a woman, is registered unemployment among females and males. In addition, I plot the population density within municipalities around the threshold since large and small cities tend to differ in a number of areas including economic growth, diversity and progressiveness, which may impact the election of females. As shown in Appendix A, Table 6, I find no significant evidence of a discontinuity in either of the demographic variables.

[25] I plot the covariates for the year of 2010 only since they remain stable over the years.

5.4.2 Local parallel trend assumption

In order for the Disc-in-Diff strategy to provide consistent estimates, the parallel trend assumption must hold. This means that the effect of the confounding policy, i.e. the type of electoral system, does not vary over time at the threshold. In other words, considering municipalities just above the threshold as treated units and municipalities below the threshold as untreated units, this assumption states that the difference between the two groups would remain the same if the quota policy was never introduced. This is comparable to the identifying assumption of a DiD strategy, but only around a local threshold. I aim to test this assumption by running the Disc-in-Diff equation (2) for each outcome variable in the pre-treatment period, using as dependent variable $\Delta_{2006}^{2010} Y_i$. Consequently, I show that municipalities slightly above and below the threshold of 20,000 inhabitants were not on differential trends before the quota policy. Another way to verify this assumption is to test for sorting around the threshold over time. As shown in Section 5.2.1, I find no evidence of manipulation in the running variable around the threshold in any of the election periods. I further verify that there are no time-varying factors that differ at the threshold. To the best of my knowledge, no other policies except from those shown in Table 2 differ around the threshold. These features remain constant during the period of 2006-2018.

5.4.3 The effect of the quota at the threshold does not depend on the electoral system

Following the reasoning by Grembi et al. (2016), the third assumption states that there must be no interaction between the treatment and the confounding policy. In the Polish context, this assumption would be violated if municipalities slightly above and below the threshold, that have separate electoral systems, would behave differently in response to a quota law. Indeed, by the nature of the FPTP system, the quota policy cannot be applied in a given constituency below the threshold since electoral committees register only one person per constituency. Therefore, it should be noted that the empirical strategy described in this paper aims to estimate the impact of the quota policy together with the PR system.

5.5 Local linear approach with optimal bandwidths

I estimate equation (2) using a non-parametric local polynomial approach proposed by Cattaneo et al. (2019). Instead of approximating functions over the entire support of the data, the local polynomial approach runs polynomial regressions successively in a narrow window of almost each point, within a sample consisting of observations lying in a certain neighborhood of the threshold. In simple terms, this method can therefore be thought of as a "smoothed" scatterplot. The local polynomial estimation is considered more robust and less sensitive to outliers than the global polynomial estimation for two reasons: it localizes the polynomial fit to the cutoff and typically uses lower-order polynomial approximation (linear or second-order instead of fourth order).

The first step of the local polynomial estimation is to select a local polynomial order, p , and a kernel function, $K(\,\cdot\,)$. The local polynomial order determines the fit of the regression lines. While high-order polynomials typically overfit the data, a polynomial order of zero is not sensitive enough. Following the recommendations by Cattaneo et al. (2019), I therefore adopt a local linear estimator. The kernel function decides how observations are weighted close to the cutoff. I use the triangular kernel which gives the most weight to observations close to the threshold, compared to the other common variants. The second step is to select a bandwidth, h , which determines how far away from the threshold I am going to consider observations. On the one hand, a bandwidth far away from the threshold gives a high precision of the estimates since more observations are included. On the other hand, including more observations makes the two sub-samples less comparable. In other words, the selection of bandwidth is a bias/variance trade-off that has to be considered carefully. In order to avoid ad hoc decisions, I use a data driven bandwidth selection. I adopt the mean square error (MSE) bandwidth selector for point estimation, which is proposed by Calonico et al. (2021) to optimize the bias-variance trade-off. For the construction of confidence intervals, however, I use a robust bias correction strategy. While the MSE bandwidth is optimal for point estimation, the CER bandwidth delivers valid inference of confidence intervals.

As stated above, I run the main regressions with dependent variables in differences for the period 2018-2010 ($\Delta_{2010}^{2018}Y_i$). To validate the local parallel trends assumption, I run a second regression for each outcome variable with dependent variables in differences for the pre-treatment period 2010-2006 ($\Delta_{2006}^{2010}Y_i$). For one of my outcome variables, namely experience, the second Disc-in-Diff regression cannot be applied since my dataset does not cover elections prior to 2006. Hence, for this variable, analyses rely on the main equation (2).

6 Results

The following section presents the short-term effects of the Polish quota on (i) the composition of candidate lists, (ii) the composition of the local council. I present four types of results for each outcome variable. First, I make an exploratory data analysis by running RD plots for each of the outcome variables, using second order polynomial regressions fitted separately on each side of the threshold. These graphical analyses provide information of a potentially existing discontinuity. Second, the result of each outcome variable is discussed from a Disc-in-Diff approach using local linear estimation with datadriven MSE-optimal bandwidths, following Calonico et al. (2021). The bandwidth is generally around 8,000 inhabitants above and below the threshold. Third, I run the Disc-in-Diff regressions for the pre-treatment period (Δ_{2006}^{2010}) to check that municipalities just below and above the cutoff were not on differential trends before the quota policy. Table 4 presents the results for my main specification. Panel A focuses on the effect of the quota policy on female representation in candidate lists and characteristics of candidates running for office. Panel B looks at the effects of the quota on the compositions of local councils. In both panels, column 1 reports the treatment effect of the quota policy. Column 6 reports estimates for the pre-treatment period to validate the local parallel trends assumption. In Appendix B, I show that the estimates are stable to a number of robustness test, including the exclusion of multi-member constituencies, sensitivity to bandwidth and alternative cutoffs.

6.1 Candidate lists

6.1.1 Electoral committees running for office

The Disc-in-Diff approach provides consistent estimates under the assumption that there are no time-varying factors that differ at the threshold. However, in case that the dataset suffers from attrition, this assumption would most likely be violated. If electoral committees find it hard meet the quota requirement, they may decide not to run, which in turn could lead to a different treatment group than before the quota was introduced, if these electoral committees are different from the ones staying in the treatment group. To analyze whether the introduction of the electoral quota led to sample attrition, I estimate the Disc-in-Diff effect of the gender quota on the number of electoral committees running for office in a given constituency. I do not find any significant evidence suggesting that quotas lead to the disappearance of candidate lists running for office. As shown in Panel A of Table 4 (column 1-5), I find no significant discontinuity in the number of electoral committees running for office just above and below the threshold. Neither do I observe any evidence of attrition in the pre-treatment period (column 6-10), validating the local parallel trends assumption before the quota policy was introduced.

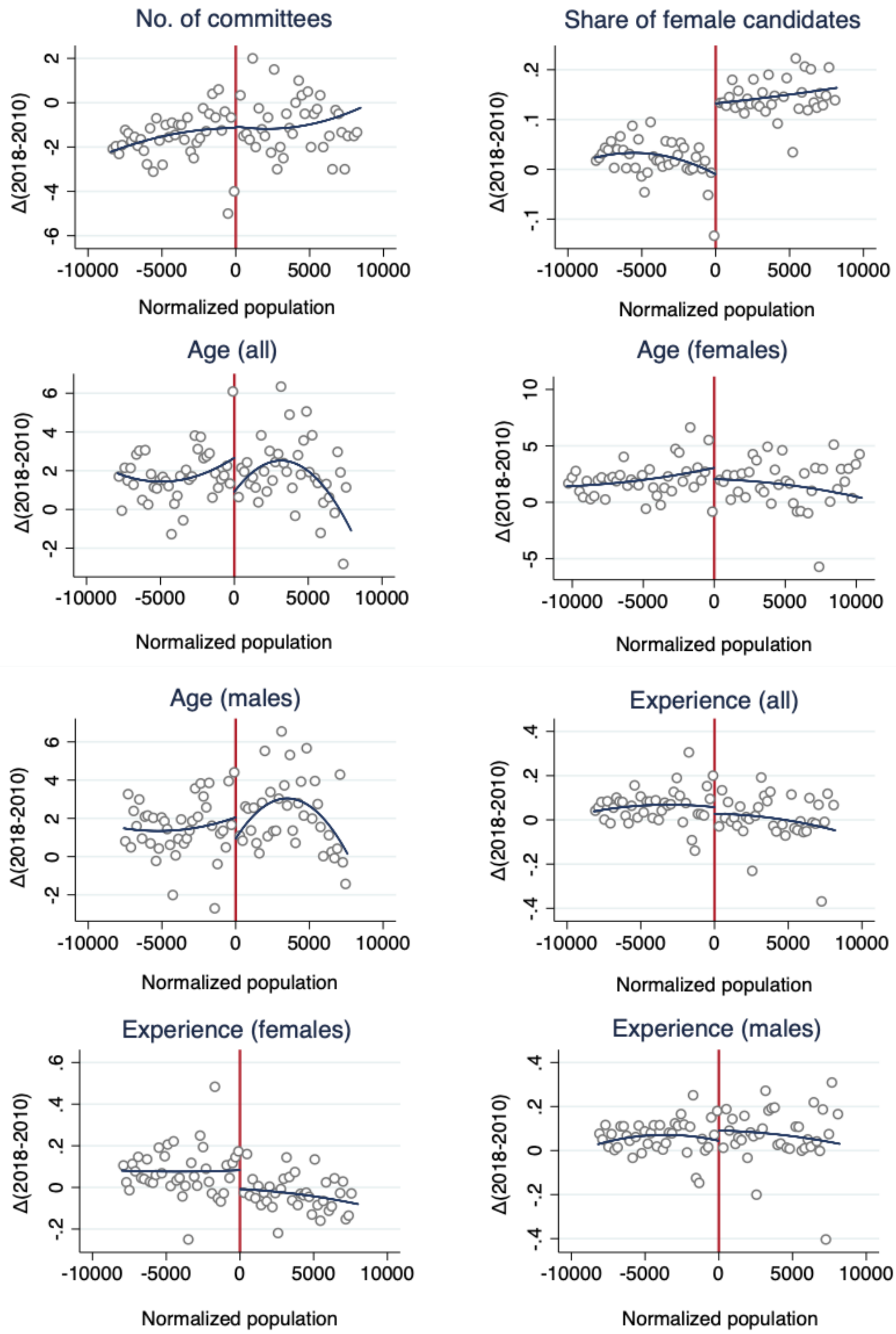
6.1.2 Female representation among candidates

The discontinuity in the application of the quota law allows me to study the effect of the quota on the share of female candidates on electoral lists. The rationale of a legislative candidate quota is that there has to be a certain fraction of females on electoral list (in this case 35 percent). Therefore, every list on the right side of the threshold will by definition have at least 35 percent women in 2018. My analysis of the data shows that this requirement was reached by a wide margin. The second graph in Figure 4 illustrates that the quota law had substantial and positive impact on the share of female candidates in Polish municipalities. In 2018, the share of female candidates in municipalities slightly above the threshold was equal to 46 percent, corresponding to an increase of 12 p.p., relative to municipalities slightly below the threshold (see Table 4, column 1-5). The magnitude of this effect is similar to, although a bit larger, than the effects found by Bagues and Campa (2021) in the Spanish and Lassébie (2020) in French context. The result is particularly interesting when considering the fact that the average share of female candidates in municipalities slightly above the threshold was very close to the quota requirement in 2010 (32 percent). In other words, although the quota law did not require a drastic change in the behavior of committees running for office, they surpassed the requirement by a wide margin. Before quotas were introduced, there was no discontinuity in the share of female candidates (Figure 10, Appendix A). Column 1-5 in Table 4 further indicates that municipalities just below and above the cutoff were not on differential trends before the policy shift.

6.1.3 Characteristics of candidates

According to the existing empirical evidence, quotas could potentially reduce the average age of the candidates running for office, because women with lower age enter the candidate pool. The fourth Disc-in-Diff plot in Figure 4 hints about a small negative discontinuity in the age of female candidates. Table 4 shows that the point estimate is negative when considering all candidates (-0.31) and female candidates (-0.890) respectively. For male candidates it is positive and close to zero (0.05). However, as opposed to Bird (2003), neither of my estimates are statistically significant from zero. One possible explanation for this result is that the average age of politicians in Polish local politics is quite stable over time and between sexes (50 years old). It is therefore reasonable to assume that women who were added as a result of the quota policy were not necessarily younger than the average female candidate. Evidence also suggests that increasing the share of female candidates would lead to an almost inevitable decrease in political experience in the short run. Indeed, Figure 4 illustrates a small negative discontinuity in the political experience of female candidates. Panel A in Table 4 confirms that political experience of female candidates decreased with 8 p.p., although significant at the 10 percent level. I find no evidence of a discontinuity when considering all candidates. Lassébie (2020) gets similar results from the French context. She finds a slight negative effect for female political experience (5 p.p.), but no significant effect for all candidates. The author concludes that the small negative magnitude of the effect could be explained by the fact that the new women replaced the least experienced males. In other words, committees tried to balance the lower political experience of women by promoting men with higher political experience. While this could be a possible explanation for my results, my point estimate for male political experience is positive but insignificant. Due to the fact that my dataset does not cover elections prior to 2006, I am not able to validate that municipalities were on local parallel trends before the quota was introduced. Hence, this measure should be interpreted with caution.

Figure 4: Discontinuity-in-Differences, Panel A: Candidate Outcomes



Notes: Vertical axis: the difference of the post-treatment outcome value (2018) and pre-treatment outcome value (2010). Horizontal axis: population size minus 20,000. Following Cattaneo et al. (2019), dots are means, lines are fitted values from second-order polynomial regressions. Data-driven bandwidths are chosen to span the full support of the data.

6.2 Local council

6.2.1 Share of female councilors

Up until this point, my analysis shows that the gender quota had a significant short-term impact on the share of female candidates running for office. Yet, I fail to show that the quota policy increased the share of females in municipal councils around the threshold. Looking to the first graph in Figure 5, it seems like there is a small discontinuity in differences in the share of female councilors above and below the threshold. However, as shown in Panel B of Table 4, the point estimate for the proportion of elected females in municipal councils is 6 p.p. and insignificant. This result stands out from the existing empirical evidence on the effects of gender quotas in the European region. Considering literature that use an RD framework and/or a Disc-in-Diff approach to estimate the short term effects of gender quotas in PR systems, evidence from for instance France, Spain and Italy shows that gender quotas led to a significant increase in the share of female councilors. Notably, the effect on the share of female candidates in these studies are lower in magnitude than what I find in the Polish context (12 p.p.). For instance, Bagues and Campa (2021) estimate that the Spanish gender quota led to a 8 p.p. increase in the share of female candidates and a 4 p.p. increase in the share of female councilors. Lassébie (2020) finds a 7 p.p. effect of the French quota on the proportion of female candidates and female councilors respectively. On the other hand, the Spanish and French gender quotas were applied in municipalities with closed-list PR systems. Evidence from open-list PR systems (see e.g. Jones & Navia, 1999), would suggest a small positive effect on the share of women elected, however not as much as when lists are closed. Although the existing empirical evidence suggests that introducing a gender quota policy in the context of open-list PR systems would lead to a modest effect on the share of elected females, the results are quite surprising considering the substantial increase in the share of female candidates. Voter bias against female candidates and/or the exclusion of placement mandates in the Polish quota law might explain why I find no evidence of a discontinuity in differences. Indeed, Schmidt (2009) argues that the most effective institutional variable for increasing the share of elected women in PR systems is placement mandates. This reasoning aligns with the findings at national level in Poland. While Gwiazda (2017) and Jankowski and Marcinkiewicz (2019) detect a slight increase in the share of elected females in the Polish parliamentarian elections, they argue that most females were placed at the bottom of the candidate lists.

6.2.2 Characteristics of councilors

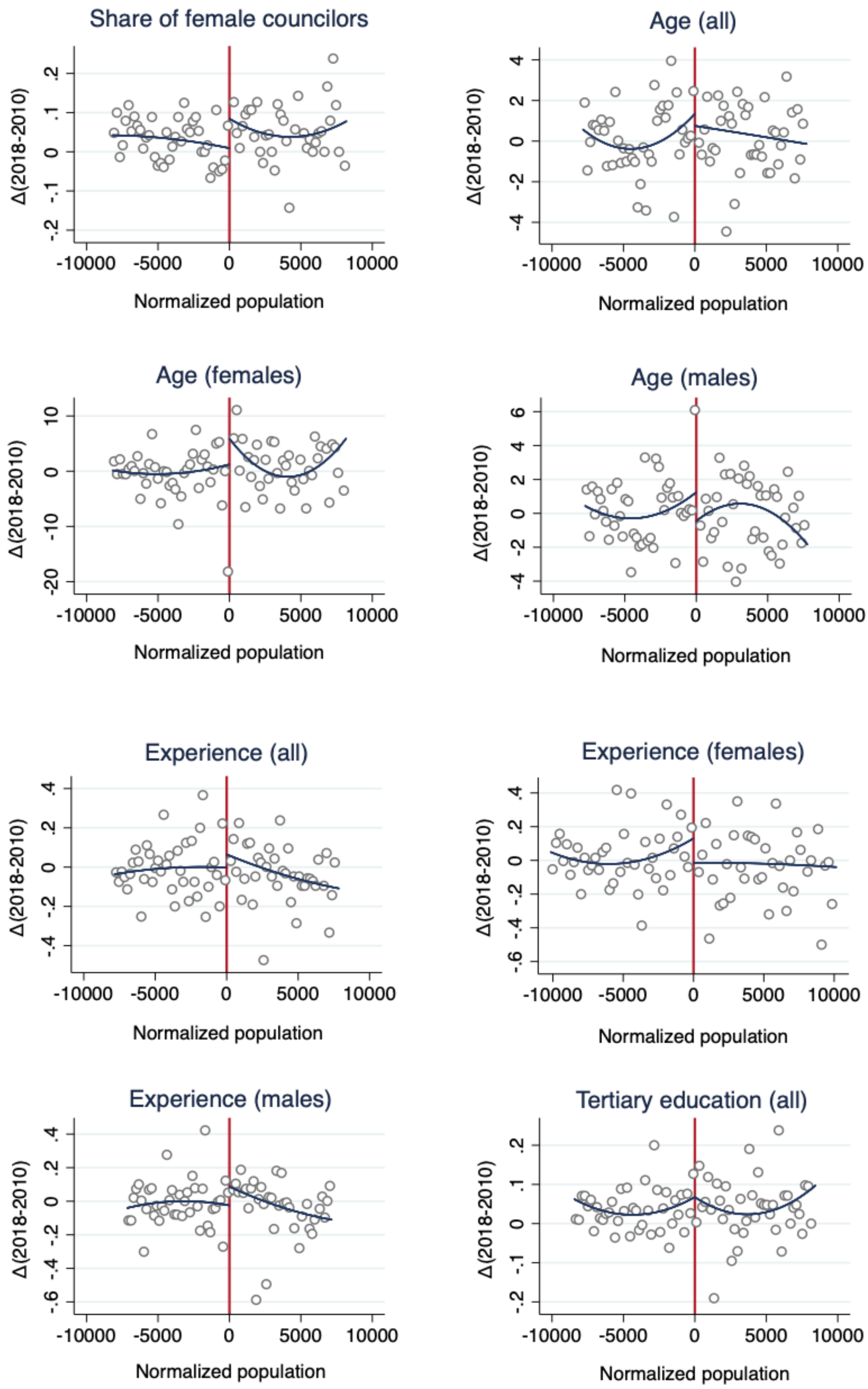
By looking at the characteristics of elected politicians I could get a sense of what type of individuals that were promoted as a result of the quota enforcement. Existing evidence from for instance Besley et al. (2017) and Baltrunaite et al. (2014) suggests that gender quotas could potentially lead to an increase in the quality of council members, if the new women replace the least qualified men on candidate lists. Therefore, I estimate the Disc-in-Diff effect on the share of elected politicians with tertiary education. Panel B of Table 4 shows that the point estimate is positive (0.05) but insignificant. Neither do I find significant evidence of a discontinuity in differences in terms of average age. However, for this variable, I detect a significant discontinuity in the pre-treatment period. Before quotas where introduced, the average age of male councilors increased with 3.61 years between 2006 and 2010, compared to municipalities slightly below the threshold of 20,000 inhabitants. In other words, I am not able to validate the local parallel trends assumption for the age of councilors. Lastly, I find no significant evidence of a discontinuity in the share of politically experienced councilors. This is not surprising, considering the fact that I find no evidence of an increase in the share of female councilors.

Table 4: Effects of introducing a gender quota, Disc-in-Diff estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Treatment effect Δ^{2010}_{2018}					**Pre treatment Δ^{2006}_{2010}**				
	β	std. error	p-val.	h	eff. obs	β	std. error	p-val.	h	eff. obs
Panel A. Candidates										
No. of committees	-0.45	0.55	0.41	8,454	503	0.74	0.63	0.24	7,089	369
Share of females	0.12***	0.02	0.00	8,200	476	0.01	0.02	0.64	8,224	456
Age:										
All candidates	-0.31	0.81	0.70	7,911	444	0.81	0.62	0.19	6,637	335
Female candidates	-0.89	1.27	0.48	10,410	697	1.23	1.13	0.28	8,626	496
Male candidates	0.05	0.91	0.96	7,587	421	0.60	0.71	0.40	6,422	321
Experience:										
All candidates	-0.03	0.05	0.51	8,185	474					
Among females	-0.08*	0.05	0.09	8,017	449					
Among males	0.03	0.05	0.54	8,201	476					
Panel B. Council										
Share of females	0.06	0.04	0.13	8,191	474	-0.01	0.03	0.80	9,421	576
Tertiary Education	0.05	0.04	0.24	8,204	477	-0.01	0.04	0.89	9,429	619
Age:										
All councilors	0.15	0.97	0.88	7,831	434	2.55**	1.02	0.01	6,598	335
Female councilors	2.90	2.15	0.18	8,171	456	0.57	1.88	0.76	7,849	403
Male councilors	-0.41	0.10	0.68	7,777	431	3.61***	1.21	0.00	5,567	258
Experience:										
All councilors	0.06	0.08	0.44	7,852	435					
Among females	-0.10	0.14	0.47	10,159	650					
Among males	0.10	0.08	0.23	7,154	388					

Notes: This table presents the results from discontinuity-in-differences anlyses on several outcome variables at the threshold of 20,000 inhabitants. Column 1-5 presents estimates for the short-term treatment effect of the gender quota. Column 6-10 present estimates for the pre-treatment period, before the quota was introduced, to validate the local parallel trends assumption. Estimation method: local linear regression with data driven (MSE) optimal bandwidth, h, and triangular kernel following Calonico et al. (2020). Estimates are reported in robust values. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 5: Discontinuity-in-Differences, Panel B: Local council



Notes: Vertical axis: the difference of the post-treatment outcome value (2018) and pre-treatment outcome value (2010). Horizontal axis: population size minus 20,000. Following Cattaneo et al. (2019), dots are means, lines are fitted values from second-order polynomial regressions. Data-driven bandwidths are chosen to span the full support of the data.

6.3 Possible mechanisms

In the following section, I test two main hypothesised mechanisms for my results. First, I provide a simple descriptive analysis of the lists placements of female candidates. Second, I estimate the Disc-in-Diff effects conditioned on the two types of electoral committees. It should be noted that, although I am not able to estimate the causal effect of these potential mechanisms, the analysis could contribute to a more comprehensive understanding of the workings of the Polish gender quota.

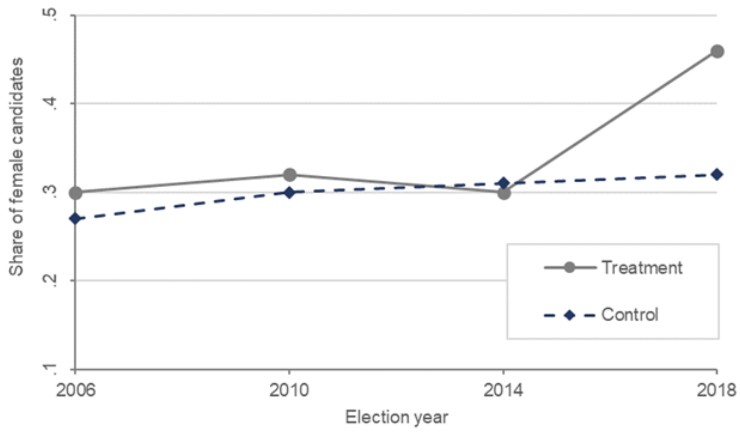
6.3.1 List placements of female politicians

My analysis from the previous section indicates that the Polish gender quota policy led to a substantial increase in the share of female candidates. To get a sense of the magnitude of this effect, Figure 6 illustrates the pattern of female representation over the years. For the 2018 election, there is a clear jump in the share of female candidates for the treatment group. This analysis confirms the large positive effect that was estimated in the Disc-in-Diff regression. However, the fact that the gender quota policy failed to increase the share of women in municipal councils begs the question of whether women were placed in positions with a real chance of winning. While electoral committees in municipalities above the threshold rank their candidates in priority order on their list, committees below the threshold propose only one candidate per constituency. Hence, I am not able to run Disc-in-Diff regressions for the share of females in certain positions. However, a mere descriptive analysis could provide a hint about the mechanisms behind the ineffectiveness of the Polish quota. Figure 7 displays the average share of women in certain list positions for the treatment group[26]. The presence of women is lowest in the first position, both before and after the quota policy was introduced. The share of women in this position has been quite stable over the years, and it increased with only a few percentage points after the quota policy was introduced (from 23 percent to 27 percent). Among positions in the upper half of the candidate list, women constituted on average 32 percent before the quota was introduced. Even in these positions, there was only a slight increase in share of women after the quota reform (38 percent). Looking at Figure 7, it is evident that a large majority of the new women were placed at the bottom of the candidate lists. The red line illustrates the change in the average share of women in bottom positions. In 2006 and 2010, the proportion of females was about 33 percent, compared to 53 percent in 2018.

Although I am not able to prove that the unfavorable list placement of women is a causal mechanism my results, it gives a plausible explanation for why the quota failed to promote women into politics. Another potential explanation could be that voters have a bias against female candidates in Polish politics. However, Jankowski and Marcinkiewicz (2019) conclude that the list placement was more important for the electoral success of a candidate than the candidate's gender in Polish parliamentarian elections.

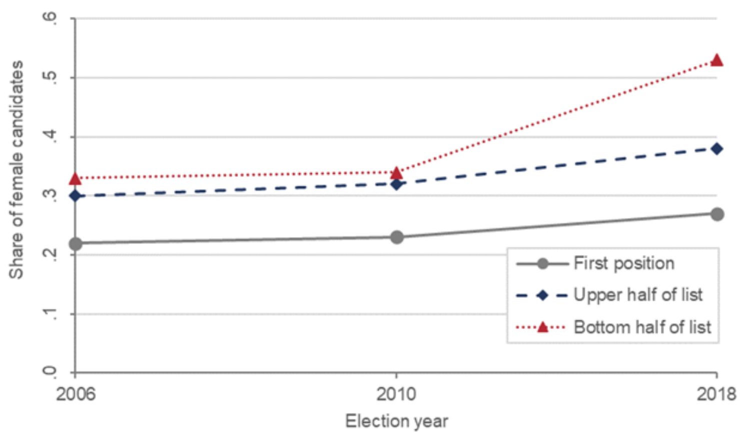
[26]Note that the election period of 2014 is excluded due to the fact that all municipalities employed FPTP systems.

Figure 6: Average share of female candidates



Notes: This graph displays the average share of female candidates in a given election year (measured at municipality level). In the 2014 election year, both the treatment and control group employed FPTP systems.

Figure 7: Female list placements in PR systems



Notes: This graph displays the average share of female candidates per electoral list in the treatment group. The share is calculated for certain positions on list.

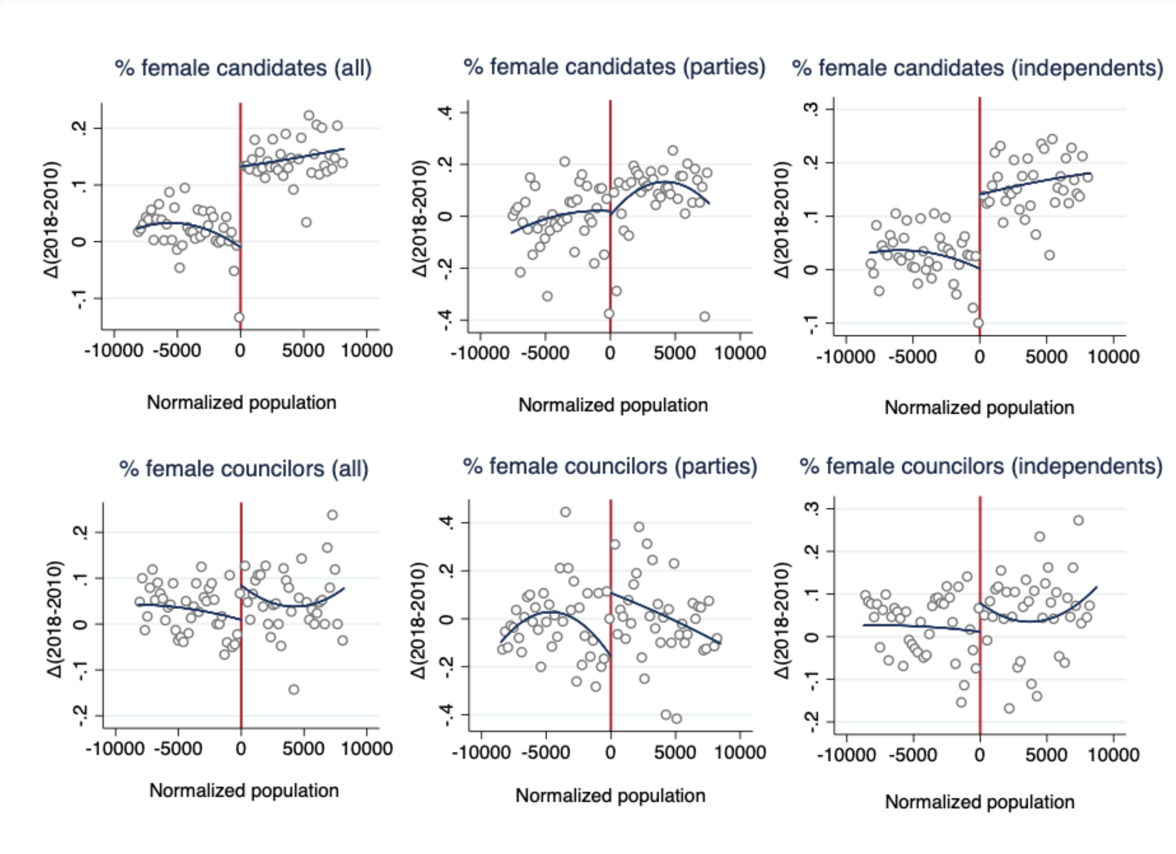
6.3.2 Party affiliation

My institutional analysis of the Polish electoral system at local level showed that municipalities using proportional representation are associated with a higher share of nation-wide parties, as opposed to municipalities below the threshold that have more independent committees established by associations or voters. I linked this to the lower cost of participating in elections with FPTP systems compared to PR systems. Differences in the workings of independent committees and nation-wide political parties could potentially matter for the functioning of the gender quota. Independent committees often promote candidates belonging to a certain geographic area and gives a chance for popular independent candidates to be elected. Hence, independent committees are most likely dependent on certain individuals running for office, as opposed to nation-wide parties that can rely more on their political standings and ideology.

Adding additional women to the candidate lists may therefore evoke different reactions among their voting supporters.

To test this hypothesis, I run the Disc-in-Diff regressions for independent committees and political parties separately. I find that the positive effect on share of females in candidate lists seems to be driven by independent committees. Figure 8 illustrates a sharp jump in the share of female candidates on lists belonging to independent committees. Panel A, Table 8 in Appendix A confirms this discontinuity. The point estimate is significant and equal to 12 p.p., which is the same magnitude that was seen for the whole sample. For committees established by parties, however, the coefficient is close to zero but insignificant.

Figure 8: Discontinuity-in-Differences, parties vs. independent committees



Notes: Vertical axis: the difference of the post-treatment outcome value (2018) and pre-treatment outcome value (2010). Horizontal axis: population size minus 20,000. Following Cattaneo et al. (2019), dots are means, lines are fitted values from second-order polynomial regressions. Data-driven bandwidths are chosen to span the full support of the data.

Looking at the share of elected females in municipal councils, the results are a bit surprising. Even though the positive effect on the share of female candidates seems to be driven by independent committees, I find a substantial positive effect of elected females for political parties. Panel B in Table 8 shows that, when considering only members of the council elected from nation-wide parties, the point estimate is 19 p.p. and significant at the 5 percent level. For independent committees, the point estimate is close to zero and insignificant. I find no evidence suggesting that independent committees and political parties were on differential trends before the quota was introduced.

One possible explanation for these results could be that political parties placed their women in better positions on the lists. However, a comparison of means within the given bandwidth does not show a difference in the ranking order of women. Another potential explanation could be that voters cast preferential votes for female candidates belonging to parties, even if they were placed at the bottom of the lists. It should be noted, however, that these estimates are dependent on the number of elected councilors. For instance, if a local council has only two members belonging to nation-wide parties, one additional woman will lead to a 50 percent increase in the share of female councilors in that commune. On the other hand, I find no evidence of a discontinuity in the share of councilors belonging to parties or in the number of parties running for office (Table 7, Appendix A).

6.4 Sensitivity tests and robustness checks

In the following section I conduct sensitives and robustness tests in order to assess the validity of the empirical design. These results are displayed in Appendix B. In total, I employ three different empirical tests: (1) Exclusion of multi-member constituencies, (2) alternative cutoffs and (3) sensitivity to bandwidth choices.

The first robustness test aims to examine whether the existence of multi-member districts could pose a threat to the validity of my results, especially since the characteristics of candidates in those districts may differ. Consequently, I run a new estimation where I only include municipalities that had a minority of multi-member constituencies, i.e. less than 25 percent. The results from this test are shown in Appendix B, Table 12. By looking at this table, I conclude that my results, overall, remain similar to the main estimates presented in Table 4. The only deviations I note are small changes in the magnitude of the significant estimates. For instance, the effect on the share of female candidates, when excluding multi-member constituencies, is 11 p.p. compared to 12 p.p. in my main estimation. Furthermore, the political experience of female candidates decreased with 8 p.p. in the main estimation, while the result from the validation test shows a decreased female experience of 12 p.p. Notably, both the share of female candidates and the experience estimates are still equally significant at 1 percent and 10 percent level respectively. The results provide indirect evidence that the characteristics of single-member constituencies are similar to the multi-member, something which is promising since changing characteristics was a potential concern when initially designing the empirical method.

The second robustness test strives to examine whether there are any significant treatment effects if the population threshold of 20,000 inhabitants is replaced by placebo values. The rationale behind this validation test is to examine whether the crucial identifying assumption holds, i.e. making sure that it does not exist any treatment effects other than at the actual threshold of the quota. The placebo values of choice below the threshold are 15,000 and 8,000, whereas the values above the threshold are 25,000 and 32,000. For the placebo regressions below the threshold, I include only municipalities from the control group, and vice versa for the placebo tests above the threshold. The results, in Appendix B, Table 13-21 Panel A, show that no significant treatment effect is found when replacing the true cutoff with placebo values; thus, the results are robust to alternative cutoffs.

The final test analyses the sensitivity of the estimation after changing bandwidth. The motivation behind investigating the sensitivity to the bandwidth choice, is that the selection of bandwidth is a bias/variance trade-off that must be considered carefully. I re-run the main estimation with four alternative bandwidths in addition to the original MSE-optimal bandwidth (which is generally around 8,000 inhabitants). The alternative bandwidths are set to 500 and 1000 inhabitants more than the MSE bandwidth, as well as 500 and 1000 inhabitants less than the MSE-bandwith. Appendix B, Table 13-21 Panel A, reports that the estimates change slightly in magnitude but remains significant at the same level. The results are therefore not sensitive to changes in bandwidth.

7 Discussion

My analysis from the previous section indicates that the Polish gender quota failed to increase the share of women in municipal councils with proportional representation systems. The results are quite remarkable in the sense that literature on electoral gender quotas suggests that proportional representation systems should work in favor of candidate quotas and women's electoral success. Reviewing the existing empirical evidence from PR systems in the European region, Bagues and Campa (2021), Baltrunaite et al. (2019), De Paola et al. (2010) and Lassébie (2020) find significant effects on the share of female councilors, although the effects differ in magnitude. In the context of open-list PR systems, Jones and Navia (1999) conclude that the adoption of quotas can lead to a positive effect on the share of elected women, however not as much as when lists are closed. Another puzzle revealed by my findings is that the effect on the share of female candidates in the aforementioned studies are lower in magnitude than what I find in the Polish context (12 p.p.). On the other hand, I did not expect to find a large effect on the share of elected women since the inclusion of placement mandates in the electoral law seems to play a great role for the effectiveness of gender quotas. Indeed, my analysis of the positioning of women suggests that female candidates were placed at the bottom of the candidate lists. The same type of reaction is found by Esteve-Volart and Bagues (2012) in the Spanish context, which further supports the claim by Kunovich and Paxton (2005): that electoral committees can act as gatekeepers for women's electoral success.

There is no escaping the fact that the impact of gender quotas are determined by the specific institutional context in which they are applied. However, my result could contribute to a more comprehensive understanding of the workings of electoral gender quotas. In particular, it adds to the already existing consensus on the importance of designing quota laws such that they leave no room for parties to circumvent them (see e.g. Bagues & Campa, 2021; Freidenvall & Dahlerup, 2013; Schmidt, 2009). From a policy perspective, my analysis points in favor of including placement mandates in the electoral law, to prevent quotas from becoming solely symbolic. This argument is well established and aligns with the recommendations from the International Institute for Democracy and Electoral Assistance, International IDEA (2021). Indeed, many quota systems today combine candidate quotas with rules regarding the ranking of candidates (e.g., Spain, France, Serbia, Argentina, Indonesia, Libya, Senegal, Tunisia and Zimbabwe) (ACE Electoral Knowledge Network, 2021). Interestingly, from studying a novel measure to reduce gender gaps in the political sphere, namely double preference voting conditioned on gender[27], in combination with candidate quotas, Baltrunaite et al. (2019) find that female councilors increased by 18 p.p., although they observe no significant effect on the share of female candidates. The authors conclude that their results are mainly driven by an increase in preference votes cast for female candidates, which further points to the importance of designing quotas properly.

[27] Double preference voting in the case of Italy implies that voters express their preference for a given party, but may also select one candidate of each gender. Voter are given the option to cast only one preference vote, or none at all.

Nevertheless, it should be noted that including placement mandates in candidate lists is not a guarantee for women's electoral success. While placement mandates in closed-list PR systems should lead to a mechanical increase in the share of elected women, the effect of either placement mandates or double preference voting in open-list PR systems is dependent on the reactions from voters. In other words, if voters in open-list systems have a bias against female politicians, the ranking order rules can be circumvented. Moreover, as noted by, Bagues and Campa (2021) and Lassébie (2020), quotas with such regulations may still fail to promote women into powerful positions.

The question remains unanswered whether placement mandates would have helped to promote women in the Polish case or not. However, recent research from the Polish parliamentarian elections by Jankowski and Marcinkiewicz (2019) shows that the placement of candidates were more important than the candidate's gender for the electoral success. Although this paper gives a hint about the voter behavior in Polish elections, it would be interesting to investigate potential voter mechanisms at the local level. For future research, one could look at the effects of the quota policy on the voter ranking of candidates relative to the candidate's list placement. By doing this, it is possible to see if voters evaded to vote for women even when the ranking was high. It would also be interesting to look at the cultural attitudes towards female politicians in Polish municipalities. For instance, Beaman et al. (2009) exploit a random assignment of gender quotas across Indian villages to see if it affects public opinion towards female leaders.

Another interesting path for future research is to evaluate if the quota helped to promote women into mayor positions. Even though the election of mayors is separate from council elections in Poland, the quota could have spillover effects. Alternatively, one could estimate the impact of gender quotas on policy-making and economic indicators. For instance, Bagues and Campa (2021) examine whether quotas led to an increase in public expenditures of spending groups that are typically relevant for female voters, such as child care. While I could have included such an analysis in this thesis, any potential effects on policy-making would most likely arise in the long run. In order for women to be able to affect policy decisions, they might need some time to acquire political capital and knowledge. Second, a substantial presence of women in councils and/or among mayor positions might be necessary to observe changes in policy outcomes. On this note, it is important to state that this thesis estimates the immediate effects of the quota policy. Certainly, it is important to evaluate the effects on female representation and leadership in politics in the long run. Lastly, my analysis of possible mechanisms raises questions that I hope will prompt future research. Although my results show that the increase in the share of female candidates seems to be driven by independent committees, I am not able to pinpoint the mechanisms of these results. More evidence is needed on the role of electoral committees for the functioning of the quota.

There are, however, some potential caveats in this study that could contribute to the fact that I find no statistically significant evidence of an increase in the share of female councilors. The first issue is that I have relatively few observations above the threshold of

20,000 inhabitants. In theory, the RD framework relies on the assumption that observations "infinitesimally" away from the cutoff are comparable. Hence, in an optimal scenario, I would have enough observations to choose a bandwidth as close as possible to the threshold. Instead, when observations are few, the bandwidth becomes larger in order to include a sufficient amount of observations. As discussed in the empirical strategy section, the local polynomial method comes with a stark bias/variance trade-off. When the bandwidth is large and includes a lot of observations, the precision of the estimates will be high. But a large bandwidth comes at the risk of bias since the inclusion of observations far away from the threshold makes the two sub-samples less comparable. It is therefore important to bear in mind that the the few number of observations above the threshold could pose a risk of bias to my results.

One of the main assumptions for my empirical strategy is the local parallel trends assumption which states that municipalities close to the threshold should not be on differential trends in absence of the gender quota. As described in Section 5, I test this assumption by running a second Disc-in-Diff regression for the pre-treatment period (2010-2006). There is a risk, however, that even if municipalities around the threshold were on parallel trends during 2006 to 2010, they could be on differential trends during 2010 to 2018. There are two reasons for this. First, since my main specification covers eight years and the pre-treatment specification covers four years, a possible threat is that municipalities close to the threshold have similar trends in the short run (during four years) but not over a longer time span. Second, the potential existence of shocks to the system during the period of 2010 to 2018 could pose a threat if municipalities in FPTP systems and PR systems reacted differently to those. For instance, the Me Too movement that began in 2017 could possibly have impacted attitudes towards female politicians among electoral committees and voters. While I cannot rule out the existence of such shocks, it is quite unlikely that any potential reactions would be different between municipalities slightly above and below the threshold. Lastly, a potential risk to the validity of my results is the relatively long time horizon of my main specification. My motivation behind measuring differences between eight years (2018-2010) is that the threshold of 20,000 inhabitants was removed in 2014, leading to that all municipalities employed FPTP systems. In other words, comparing outcomes between 2014 and 2018 does not allow me to disentangle the effect of the quota policy from the change in electoral system. An issue related to this is the possible existence of anticipation effects. Since the quota law was implemented at national level in 2011, there is a risk that municipalities anticipated to the requirement already in the 2014 election. If such behavior was found only among the treated municipalities, my Disc-in-Diff would still capture this effect. If however, some municipalities below the threshold also anticipated to the quota law, my Disc-in-Diff analysis would fail to capture this effect. I argue that this is not very likely, however, since municipalities could not be aware of the fact that the threshold was going to be back in place in 2018.

8 Conclusion

Despite the popularity of electoral gender quotas as policy instruments, their value is still a debated topic. Whether quotas succeed to promote women into politics or not is determined by their design, in combination with the specific institutional context in which they are applied. Using a Discontinuity-in-Difference design, this thesis aims to estimate the causal short-term impact of electoral gender quotas on female representation in Polish local politics. I find that the quota policy, stipulating a minimum of 35 percent women in candidate lists, increased the share of female candidates by 12 p.p. Yet, I fail to show that the quota law increased the share of females in municipal councils. Neither do I observe any significant evidence of a change in the composition of municipal councils when it comes to age, political experience or education. Overall, my analysis suggest that the Polish quota failed to increase female presence in local decision-making bodies, presumably because females were placed at the bottom of the candidate lists.

Although the impact of gender quotas are determined by the specific institutional context in which they are applied, my result could contribute to a more comprehensive understanding of the workings of electoral gender quotas. In particular, it adds to the already existing consensus on the importance of designing quota laws such that they leave no room for parties to circumvent them. From a policy perspective, this points in favor of including placement mandates in the electoral law. Further research is needed to address potential voter mechanisms as well as the long-term effects of the Polish quota on female representation in politics.

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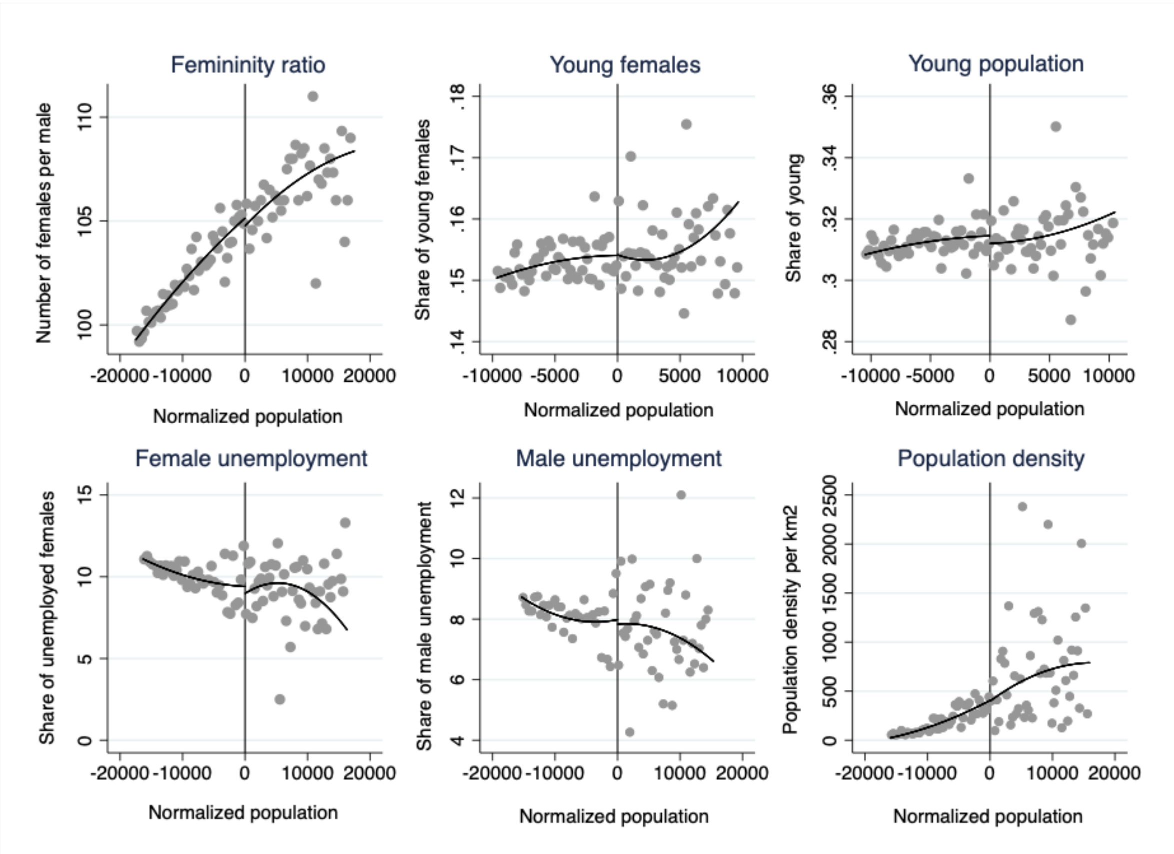
A Additional output

Table 5: Additional summary statistics for candidate lists in PR systems

	Municipalities above 20,000	
	Pre quota policy	Post quota policy
Candidate lists		
Lists fulfilling the quota requirement	38%	99.99%
Share of females in first position	23%	27%
Share of females in upper half of list	32%	38%
Share of females in bottom half of list	34%	53%
Number of electoral lists	7,457	7,457
Number of candidates	73,758	73,758

Notes: PR stands for Proportional Representation. "Lists fulfilling the quota requirement" in 2010 measures the share of candidate lists that fulfilled the quota requirement (35%) before the quota policy was introduced. Variables are measured on municipality level.

Figure 9: Continuity analysis on predetermined covariates



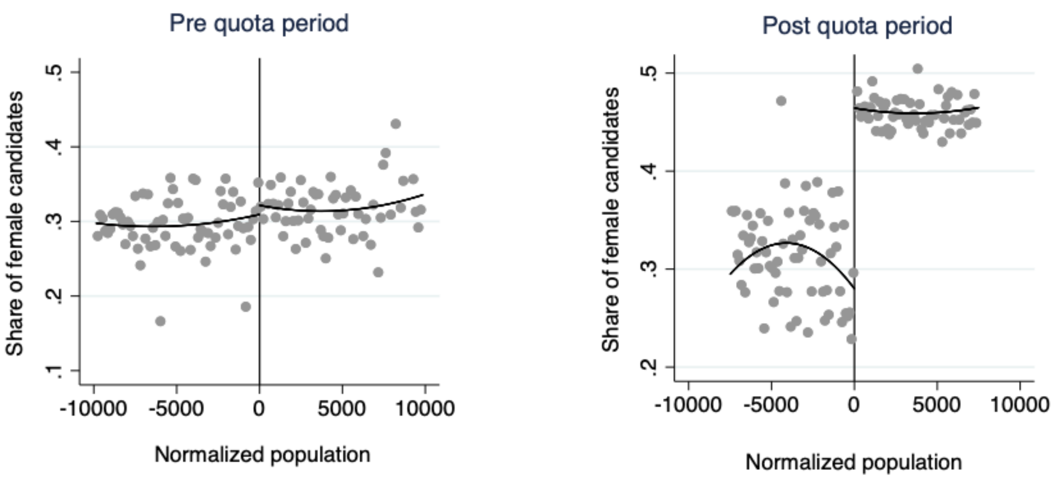
Notes: Vertical axis: pre-treatment outcome value (2010). Horizontal axis: population size minus 20,000. Following Calonico et al. (2019), dots are means, lines are fitted values from second-order polynomial regressions. Data-driven bandwidths are chosen to span the full support of the data.

Table 6: Formal Continuity-Based Analysis for Covariates

	MSE-Optimal Bandwidth	RD Estimator	Robust Inference p-value	Robust Inference Conf. Int	Eff. Number Observations
Femininity ratio	15952	-5.828	0.950	[-129, 177]	1987
Young females	9681	-0.001	0.758	[-0.01, 0.01]	642
Young population	10491	-0.002	0.480	[-0.1, 0.01]	734
Female unemployment	16334	0.064	0.925	[-1.25, 1.38]	2103
Male unemployment	15350	-0.005	0.992	[-1.14, 1.13]	1811
Population density	15952	-5.828	0.950	[-188, 177]	1987

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 10: RD plots: Share of female candidates



Notes: Vertical axis: Share of female candidates (per municipality). Horizontal axis: population size minus 20,000. Following Calonico et al. (2019), dots are means, lines are fitted values from second-order polynomial regressions. Data-driven bandwidths are chosen to span the full support of the data.

Table 7: Number of committees: Disc-in-Diff estimates

	No. of committees (all committees)	No. of parties	No. of associations
Panel A: Candidate lists			
Disc-in-Diff estimate	-0.450	-0.553	0.147
	(0.550)	(0.313)	(0.458)
MSE-optimal bandwidth	8454	9454	8036
N below cutoff	387	474	341
N above cutoff	116	123	111
95% Conf. Interval	[-1.529, 0.628]	[-1.167, 0.060]	[-0.751, 1.045]
Mean dep. var	-1.621	-0.578	-0.950
Observations	2,365	2,365	2,365
Local trends validation	0.741	0.315	0.402
	(0.626)	(0.408)	(0.551)
MSE-optimal bandwidth	7089	7789	6911
N below cutoff	267	314	256
N above cutoff	102	110	102
95% Conf. Interval	[-0.485, 1.967]	[-0.485, 1.115]	[-0.677, 1.481]
Observations	2,365	2,365	2,365
	No. of committees (all committees)	No. of parties	No. of associations
Panel B: Local council			
Disc-in-Diff estimate	-0.152	-0.487	0.379
	(0.474)	(0.296)	(0.454)
MSE-optimal bandwidth	9680	8630	9054
N below cutoff	494	398	438
N above cutoff	127	116	120
95% Conf. Interval	[-1.080, 0.776]	[-1.068, 0.093]	[-0.511, 1.269]
Mean dep. var	-0.997	-0.309	-0.975
Observations	2,365	2,365	2,365
Local trends validation	-1.233**	-0.131	-1.059
	(0.623)	(0.337)	(0.602)
MSE-optimal bandwidth	6226	7247	5740
N below cutoff	206	277	177
N above cutoff			
95% Conf. Interval	[-2.454, -0.013]	[-0.792, 0.530]	[-2.239, 0.120]
Observations	2,365	2,365	2,365

Notes: This table presents the results from discontinuity-in-differences analyses on the number of committees running for office. Estimation method: local linear regression with data driven (MSE) optimal bandwidth, and triangular kernel following Calonico et al. (2020). Estimates are reported in robust values. Outcome variables are measured at municipality level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Share of females: Disc-in-Diff estimates

	Share of females (all candidates)	Share of females (among parties)	Share of females (among associations)
Panel A: Candidate lists			
Disc-in-Diff estimate	0.123***	-0.011	0.125***
	(0.020)	(0.072)	(0.026)
MSE-optimal bandwidth	8200	7624	8256
N below cutoff	361	312	366
N above cutoff	115	110	115
95% Conf. Interval	[0.084, 0.163]	[-0.152, 0.130]	[0.073, 0.176]
Mean dep. var	0.027	-0.005	0.029
Observations	2,365	2,365	2,365
Local trends validation	0.010	0.059	0.019
	(0.020)	(0.058)	(0.032)
MSE-optimal bandwidth	8224	8136	8484
N below cutoff	343	337	371
N above cutoff	113	113	115
95% Conf. Interval	[-0.030, 0.049]	[-0.057, 0.169]	[-0.044, 0.082]
Observations	2,365	2,365	2,365
	Share of females (all councilors)	Share of females (among parties)	Share of females (among associations)
Panel B: Local council			
Disc-in-Diff estimate	0.057	0.194**	0.0364
	(0.037)	(0.020)	(0.056)
MSE-optimal bandwidth	8191	8504	8738
N below cutoff	359	391	411
N above cutoff	115	116	116
95% Conf. Interval	[-0.016, 0.130]	[0.030, 0.357]	[-0.073, 0.146]
Mean dep. var	0.039	-0.021	0.034
Observations	2,365	2,365	2,365
Local trends validation	-0.008	-0.123	-0.035
	(0.031)	(0.093)	(0.049)
MSE-optimal bandwidth	9421	6692	7324
N below cutoff	447	241	282
N above cutoff	120	98	106
95% Conf. Interval	[-0.069, 0.053]	[-0.304, 0.059]	[-0.132, 0.062]
Observations	2,365	2,365	2,365

Notes: This table presents the results from discontinuity-in-differences analyses on the share of females candidates. Estimation method: local linear regression with data driven (MSE) optimal bandwidth, and triangular kernel following Calonico et al. (2020). Estimates are reported in robust values. Outcome variables are measured at municipality level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Age: Disc-in-Diff estimates

	Age of candidates (All candidates)	Age of candidates (Female candidates)	Age of candidates (Male candidates)
Panel A: Candidate lists			
Disc-in-Diff estimate	-0.307	-0.892	0.0478
	(0.805)	(1.265)	(0.806)
MSE-optimal bandwidth	7911	10410	7587
N below cutoff	333	566	311
N above cutoff	111	131	110
95% Conf. Interval	[-1.886, 1.272]	[-3.372, 1.587]	[-1.745, 1.840]
Mean dep. var	1.673	-1.844	1.530
Observations	2,365	2,365	2,365
Local trends validation	0.810	1.235	0.599
	(0.617)	(1.134)	(0.712)
MSE-optimal bandwidth	6637	8626	6422
N below cutoff	237	379	224
N above cutoff	98	117	97
95% Conf. Interval	[-0.399, 2.020]	[-0.988, 3.457]	[-0.797, 1.994]
Observations	2,365	2,365	2,365
	Age of councilors (All councilors)	Age of councilors (Female councilors)	Age of councilors (Male councilors)
Panel B: Local council			
Disc-in-Diff estimate	0.150	2.895	-0.406
	(0.973)	(2.147)	(0.996)
MSE-optimal bandwidth	7831	8171	7777
N below cutoff	323	346	320
N above cutoff	111	110	111
95% Conf. Interval	[-1.756, 2.056]	[-1.314, 7.104]	[-2.358, 1.547]
Mean dep. var	0.0382	-0.027	0.078
Observations	2,365	2,365	2,365
Local trends validation	2.550**	0.566	3.610
	(1.012)	(1.877)	(1.201)
MSE-optimal bandwidth	6598	7849	5567
N below cutoff	237	299	168
N above cutoff	98	104	90
95% Conf. Interval	[0.552, 4.548]	[-3.111, 4.245]	[1.245, 5.976]
Observations	2,365	2,365	2,365

Notes: This table presents the results from discontinuity-in-differences analyses on the average age of politicians. Estimation method: local linear regression with data driven (MSE) optimal bandwidth, and triangular kernel following Calonico et al. (2020). Estimates are reported in robust values. Outcome variables are measured at municipality level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Political experience: Disc-in-Diff estimates

	Experience (all candidates)	Experience (female candidates)	Experience (male candidates)
Panel A: Candidate lists			
Disc-in-Diff estimate	-0.031	-0.080*	0.034
	(0.0473)	(0.046)	(0.055)
MSE-optimal bandwidth	8185	8071	8201
N below cutoff	359	338	361
N above cutoff	115	111	115
95% Conf. Interval	[-0.124, 0.062]	[-0.171, 0.011]	[-0.073, 0.141]
Mean dep. var	0.059	0.074	0.062
Observations	2,365	2,365	2,365
	Experience (all councilors)	Experience (female councilors)	Experience (male councilors)
Panel B: Local council			
Disc-in-Diff estimate	0.064	-0.098	0.099
	(0.083)	(0.135)	(0.083)
MSE-optimal bandwidth	7852	10159	7154
N below cutoff	324	524	281
N above cutoff	111	126	107
95% Conf. Interval	[-0.099, 0.227]	[-0.363, 0.167]	[-0.064, 0.263]
Mean dep. var	-0.015	0.007	-0.014
Observations	2,365	2,365	2,365

Notes: This table presents the results from discontinuity-in-differences analyses on the share of politicians with political experience. Estimation method: local linear regression with data driven (MSE) optimal bandwidth, and triangular kernel following Calonico et al. (2020). Estimates are reported in robust values. Outcome variables are measured at municipality level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 11: Tertiary education of councilors: Disc-in-Diff estimates

	Share of councilors with tertiary education
Panel B: Local council	
Disc-in-Diff estimate	0.046
	(0.039)
MSE-optimal bandwidth	8204
N below cutoff	362
N above cutoff	115
95% Conf. Interval	[-0.030, 0.123]
Mean dep. var	0.068
Observations	2,365
Local trends validation	0.006
	(0.045)
MSE-optimal bandwidth	9429
N below cutoff	449
N above cutoff	120
95% Conf. Interval	[-0.081, 0.094]
Observations	2,365

Notes: This table presents the results from discontinuity-in-differences analyses on the share of politicians with tertiary education. Estimation method: local linear regression with data driven (MSE) optimal bandwidth, and triangular kernel following Calonico et al. (2020). Estimates are reported in robust values. Outcome variables are measured at municipality level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

B Robustness tests

Table 12: Main results excluding multi-member constituencies: robustness checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Treatment effect Δ_{2018}^{2010}					**Pre treatment** Δ_{2010}^{2006}				
	β	std. error	p-val.	h	eff. obs	β	std. error	p-val.	h	eff. obs
Panel A. Candidates										
No. of committees:										
All committees	0.24	0.74	0.74	8953	260	0.17	0.78	0.83	7103	197
Parties	-0.59	0.39	0.13	8640	248	-0.45	0.58	0.44	7587	209
Associations	0.82	0.69	0.24	8431	245	0.68	0.80	0.40	7337	204
Share of females:										
All candidates	0.11***	0.03	0.00	8566	246	0.02	0.03	0.51	7489	208
Among parties	-0.09	0.11	0.44	7249	211	0.02	0.08	0.79	7258	201
Among associations	0.11***	0.04	0.01	8071	233	0.05	0.04	0.27	6800	188
Age:										
All candidates	-1.56	1.18	0.19	7303	214	0.27	0.10	0.79	7308	203
Female candidates	-1.59	1.84	0.39	8318	243	0.49	1.71	0.78	7748	215
Male candidates	-1.70	1.20	0.16	6599	189	0.42	1.06	0.69	7462	206
Experience:										
All candidates	-0.03	0.07	0.71	8226	241					
Among females	-0.12*	0.07	0.10	7465	216					
Among males	0.05	0.08	0.55	8363	243					
Panel B. Local council										
No. of committees:										
All committees	0.54	0.72	0.45	9119	266	-1.03	0.90	0.25	6130	164
Parties	-0.54	0.35	0.12	8015	232	-0.40	0.42	0.35	7570	209
Associations	0.98	0.66	0.14	8624	248	-0.59	0.85	0.49	6354	176
Share of females:										
All councilors	-0.01	0.05	0.86	8199	240	0.00	0.05	0.94	8337	235
Among parties	0.22*	0.13	0.09	8349	243	-0.14	0.13	0.30	7105	197
Among associations	-0.06	0.08	0.43	7829	225	0.03	0.06	0.66	7834	218
Tertiary Education	0.04	0.06	0.52	7783	224	-0.00	0.06	0.95	8970	258
Age:										
All councilors	-0.53	1.33	0.69	8087	234	1.03	1.31	0.43	6896	193
Female councilors	3.69	3.21	0.25	8040	224	-0.08	3.21	0.98	8547	231
Male councilors	-1.10	1.40	0.15	7566	218	1.92	1.64	0.24	7277	202
Experience:										
All councilors	0.04	0.10	0.72	7778	224					
Among females	-0.01	0.17	0.94	9174	260					
Among males	0.05	0.10	0.62	7513	217					

Notes: This table presents the results from discontinuity-in-differences analyses on several outcome variables at the threshold of 20,000 inhabitants. The sample of the control group is restricted to 739 municipalities, including only those which had less than 25% multi-member constituencies. In total, the sample of this robustness test includes 980 municipalities. Column 1-5 presents estimates for the short-term treatment effect of the gender quota. Column 6-10 present estimates for the pre-treatment period, before the quota was introduced, to validate the local parallel trends assumption. Estimation method: local linear regression with data driven (MSE) optimal bandwidth, h, and triangular kernel following Calonico et al. (2020). Estimates are reported in robust values. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 13: Number of committees running for office: robustness checks

Panel A: Alt. cut-offs

Dependent variable:	Number of committees				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	-0.178	0.164	-0.450	-1.234	-0.688
	(0.316)	(0.959)	(0.550)	(0.907)	(0.757)
Robust p-value	0.572	0.864	0.413	0.170	0.363
Cut-off (c)	8000	15000	20000	25000	32000
Bandwidth (h)	2751	2049	8500	4344	5851
Observations (left of c, right of c)	630, 341	122, 81	387, 116	74, 44	49, 31

Panel B: Alt. bandwidths

Dependent variable:	Number of committees				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	0.411	0.216	-0.450	-0.058	-0.168
	(0.857)	(0.823)	(0.550)	(0.756)	(0.727)
Robust p-value	0.631	0.793	0.413	0.939	0.817
Cut-off (c)	20000	20000	20000	20000	20000
Bandwidth (h)	7500	8000	8500	9000	9500
Observations (left of c, right of c)	308, 109	338, 111	387, 116	430, 120	480, 124

Notes: The table shows the robustness checks of non-parametric estimation. Panel A reports results for (normalized) placebo cut-offs, namely -12000, -5000, 5000 and 12000 inhabitants, in addition to the correct one reported in Column 3 (20,000 normalized to zero). Panel B reports results for alternative bandwidths, namely 7500, 8000, 9000 and 9500, in addition to the MSE-optimal data driven bandwidth in column 3. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 14: Share of female candidates: robustness checks

Panel A: Alt. cut-offs

Dependent variable:	Share of female candidates				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	-0.020	-0.034	0.123***	0.004	0.018
	(0.018)	(0.032)	(0.020)	(0.038)	(0.027)
Robust p-value	0.271	0.285	0.000	0.911	0.500
Cut-off (c)	8000	15000	20000	25000	32000
Bandwidth (h)	2751	2110	8200	4059	6228
Observations (left of c, right of c)	630, 341	126, 83	360, 115	66, 41	55, 33

Panel B: Alt. bandwidths

Dependent variable:	Share of female candidates				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	0.150***	0.145***	0.123***	0.141***	0.140***
	(0.029)	(0.028)	(0.020)	(0.026)	(0.025)
Robust p-value	0.000	0.000	0.000	0.000	0.000
Cut-off (c)	20000	20000	20000	20000	20000
Bandwidth (h)	7200	7700	8200	8700	9200
Observations (left of c, right of c)	284, 108	315, 111	360, 115	409, 116	448, 121

Notes: The table shows the robustness checks of non-parametric estimation. Panel A reports results for (normalized) placebo cut-offs, namely -12000, -5000, 5000 and 12000 inhabitants, in addition to the correct one reported in Column 3 (20,000 normalized to zero). Panel B reports results for alternative bandwidths, namely 7200, 7700, 8700 and 9200, in addition to the MSE-optimal data driven bandwidth in column 3. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 15: Age of candidates: robustness checks

Panel A: Alt. cut-offs

Dependent variable:	Age of candidates				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	-0.380	0.993	-0.181	-0.648	-0.973
	(0.587)	(1.234)	(0.806)	(0.679)	(1.227)
Robust p-value	0.517	0.421	0.703	0.679	0.428
Cut-off (c)	8000	15000	20000	25000	32000
Bandwidth (h)	2828	1597	8000	4144	5954
Observations (left of c, right of c)	657, 349	93, 64	333, 111	69, 41	49, 32

Panel B: Alt. bandwidths

Dependent variable:	Age of candidates				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	-0.515	-1.755	-0.181	-0.010	0.087
	(1.172)	(1.120)	(0.806)	(1.040)	(1.001)
Robust p-value	0.154	0.117	0.703	0.110	0.132
Cut-off (c)	20000	20000	20000	20000	20000
Bandwidth (h)	7000	7500	8000	8500	9000
Observations (left of c, right of c)	271, 104	308, 109	333, 111	391, 116	430, 120

Notes: The table shows the robustness checks of non-parametric estimation. Panel A reports results for (normalized) placebo cut-offs, namely -12000, -5000, 5000 and 12000 inhabitants, in addition to the correct one reported in Column 3 (20,000 normalized to zero). Panel B reports results for alternative bandwidths, namely 7000, 7500, 8500 and 9000, in addition to the MSE-optimal data driven bandwidth in column 3. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 16: Experience of candidates: robustness checks

Panel A: Alt. cut-offs

Dependent variable:	Experience of candidates				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	-0.014	-0.006	-0.031	-0.006	0.006
	(0.032)	(0.074)	(0.047)	(0.052)	(0.046)
Robust p-value	0.666	0.934	0.509	0.913	0.893
Cut-off (c)	8000	15000	20000	25000	32000
Bandwidth (h)	2880	2100	8200	3903	5695
Observations (left of c, right of c)	667, 352	126, 83	359, 115	63, 39	47, 30

Panel B: Alt. bandwidths

Dependent variable:	Experience of candidates				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	-0.031	-0.031	-0.031	-0.028	-0.027
	(0.067)	(0.065)	(0.047)	(0.061)	(0.059)
Robust p-value	0.643	0.628	0.509	0.639	0.648
Cut-off (c)	20000	20000	20000	20000	20000
Bandwidth (h)	7200	7700	8200	8700	9200
Observations (left of c, right of c)	284, 108	315, 111	359, 115	409, 116	448, 121

Notes: The table shows the robustness checks of non-parametric estimation. Panel A reports results for (normalized) placebo cut-offs, namely -12000, -5000, 5000 and 12000 inhabitants, in addition to the correct one reported in Column 3 (20,000 normalized to zero). Panel B reports results for alternative bandwidths, namely 7200, 7700, 8700 and 9200, in addition to the MSE-optimal data driven bandwidth in column 3. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 17: Number of committees in council: robustness checks

Panel A: Alt. cut-offs

Dependent variable:	Number of committees in council				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	0.089	0.784	-0.152	-0.305	-0.133
	(0.326)	(0.685)	(0.743)	(0.753)	(0.708)
Robust p-value	0.758	0.252	0.748	0.686	0.851
Cut-off (c)	8000	15000	20000	25000	32000
Bandwidth (h)	2948	1882	9600	4564	6169
Observations (left of c, right of c)	690, 356	115, 76	494, 127	75, 46	53, 33

Panel B: Alt. bandwidths

Dependent variable:	Number of committees in council				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	-0.039	-0.075	-0.152	-0.104	-0.137
	(0.706)	(0.680)	(0.473)	(0.628)	(0.607)
Robust p-value	0.956	0.912	0.748	0.869	0.821
Cut-off (c)	20000	20000	20000	20000	20000
Bandwidth (h)	8600	9100	9600	10100	10600
Observations (left of c, right of c)	397, 116	442, 120	494, 127	530, 130	589, 134

Notes: The table shows the robustness checks of non-parametric estimation. Panel A reports results for (normalized) placebo cut-offs, namely -12000, -5000, 5000 and 12000 inhabitants, in addition to the correct one reported in Column 3 (20,000 normalized to zero). Panel B reports results for alternative bandwidths, namely 8600, 9100, 10100 and 10600, in addition to the MSE-optimal data driven bandwidth in column 3. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 18: Share of female councilors: robustness checks

Panel A: Alt. cut-offs

Dependent variable:	Share of female councilors				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	0.007	-0.026	0.057	-0.077	0.081
	(0.027)	(0.050)	(0.037)	(0.059)	(0.088)
Robust p-value	0.800	0.605	0.126	0.189	0.358
Cut-off (c)	8000	15000	20000	25000	32000
Bandwidth (h)	2924	2147	8200	3874	6455
Observations (left of c, right of c)	679, 354	130, 85	360, 115	63, 38	60, 34

Panel B: Alt. bandwidths

Dependent variable:	Share of female councilors				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	0.089	0.080	0.057	0.071	0.072
	(0.055)	(0.052)	(0.037)	(0.049)	(0.047)
Robust p-value	0.102	0.126	0.126	0.145	0.125
Cut-off (c)	20000	20000	20000	20000	20000
Bandwidth (h)	7200	7700	8200	8700	9200
Observations (left of c, right of c)	284, 108	315, 111	360, 115	409, 116	448, 121

Notes: The table shows the robustness checks of non-parametric estimation. Panel A reports results for (normalized) placebo cut-offs, namely -12000, -5000, 5000 and 12000 inhabitants, in addition to the correct one reported in Column 3 (20,000 normalized to zero). Panel B reports results for alternative bandwidths, namely 7200, 7700, 8700 and 9200, in addition to the MSE-optimal data driven bandwidth in column 3. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 19: Share of councilors with tertiary education: robustness checks

Panel A: Alt. cut-offs

Dependent variable:	Share of councilors with tertiary education				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	0.023	-0.051	0.046	0.001	0.017
	(0.025)	(0.062)	(0.039)	(0.078)	(0.090)
Robust p-value	0.344	0.406	0.234	0.990	0.850
Cut-off (c)	8000	15000	20000	25000	32000
Bandwidth (h)	2460	1917	8200	4289	7097
Observations (left of c, right of c)	542, 310	115, 76	362, 115	72, 43	67, 37

Panel B: Alt. bandwidths

Dependent variable:	Share of councilors with tertiary education				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	0.067	0.064	0.046	0.064	0.060
	(0.060)	(0.057)	(0.039)	(0.053)	(0.051)
Robust p-value	0.266	0.261	0.234	0.224	0.235
Cut-off (c)	20000	20000	20000	20000	20000
Bandwidth (h)	7200	7700	8200	8700	9200
Observations (left of c, right of c)	284, 188	315, 111	362, 115	409, 116	448, 121

Notes: The table shows the robustness checks of non-parametric estimation. Panel A reports results for (normalized) placebo cut-offs, namely -12000, -5000, 5000 and 12000 inhabitants, in addition to the correct one reported in Column 3 (20,000 normalized to zero). Panel B reports results for alternative bandwidths, namely 7200, 7700, 8700 and 9200, in addition to the MSE-optimal data driven bandwidth in column 3. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 20: Age of councilors: robustness checks

Panel A: Alt. cut-offs

Dependent variable:	Age of councilors				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	0.617	1.214	0.150	-0.689	-0.077
	(0.716)	(1.611)	(0.973)	(1.728)	(1.757)
Robust p-value	0.388	0.451	0.878	0.690	0.965
Cut-off (c)	8000	15000	20000	25000	32000
Bandwidth (h)	2533	1517	7800	4506	5929
Observations (left of c, right of c)	567, 316	85, 63	323, 111	75, 46	49, 32

Panel B: Alt. bandwidths

Dependent variable:	Age of councilors				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	-0.379	-0.562	0.150	-0.619	-0.560
	(1.369)	(1.311)	(0.973)	(1.223)	(1.185)
Robust p-value	0.782	0.668	0.878	0.613	0.636
Cut-off (c)	20000	20000	20000	20000	20000
Bandwidth (h)	6800	7300	7800	8300	8800
Observations (left of c, right of c)	258, 102	294, 108	323, 111	375, 115	414, 117

Notes: The table shows the robustness checks of non-parametric estimation. Panel A reports results for (normalized) placebo cut-offs, namely -12000, -5000, 5000 and 12000 inhabitants, in addition to the correct one reported in Column 3 (20,000 normalized to zero). Panel B reports results for alternative bandwidths, namely 6800, 7300, 8300 and 8800, in addition to the MSE-optimal data driven bandwidth in column 3. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 21: Experience of councilors: robustness checks

Panel A: Alt. cut-offs

Dependent variable:	Experience of councilors				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	0.027	0.065	0.064	0.079	-0.186
	(0.048)	(0.120)	(0.083)	(0.101)	(0.130)
Robust p-value	0.580	0.591	0.444	0.453	0.152
Cut-off (c)	8000	15000	20000	25000	32000
Bandwidth (h)	2822	2150	7800	3768	5761
Observations (left of c, right of c)	655, 348	131, 85	324, 111	62, 37	49, 31

Panel B: Alt. bandwidths

Dependent variable:	Experience of councilors				
	(1)	(2)	(3)	(4)	(5)
Disc-in-Diff estimate	0.065	0.067	0.064	0.070	0.069
	(0.119)	(0.115)	(0.083)	(0.108)	(0.105)
Robust p-value	0.582	0.558	0.444	0.520	0.510
Cut-off (c)	20000	20000	20000	20000	20000
Bandwidth (h)	6800	7300	7800	8300	8800
Observations (left of c, right of c)	258, 102	294, 108	324, 111	375, 115	414, 117

Notes: The table shows the robustness checks of non-parametric estimation. Panel A reports results for (normalized) placebo cut-offs, namely -12000, -5000, 5000 and 12000 inhabitants, in addition to the correct one reported in Column 3 (20,000 normalized to zero). Panel B reports results for alternative bandwidths, namely 6800, 7300, 8300 and 8800, in addition to the MSE-optimal data driven bandwidth in column 3. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.