# Does Exposure Reduce Gender Bias in Politics? Evidence from A Non-Affirmative Action Natural Experiment

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Abstract

We examine whether prior exposure to female politicians leads to electoral gains for women in subsequent elections. We exploit random variation in female candidates' election outcomes arising from a non-affirmative action natural experiment. In Korea, for the 2006 local council election, which was based on a multi-member district system, the ballot numbers were assigned to candidates according to the alphabetical order of their names when there were multiple candidates from a party. That peculiar rule increased elected female members accidentally in certain districts, which in turn increased the number for female candidates and their probability of winning in the next election. However, we find that the impacts are significant only in the districts where no single party is dominant and, furthermore, the impacts are driven by the incumbency advantage. And we find no positive effect on non-incumbent female candidates and even adverse impacts on independent female candidates and females in the districts where there is no competition between major parties.

# I. Introduction

A popular explanation for female under-representation in politics is that voters and/or parties are less likely to trust female politicians, although they are not biased against women.[1] For example, risk-averse voters should be less likely to vote for female candidates when the quality of female candidates is less known, even if they believe that there is no gender difference in terms of political quality. Such risk-averse behavior of voters might as well affect vote-maximizing parties, and they would nominate fewer women. Also, political parties might be uncertain of the quality of female politicians and thus nominate fewer women, worsening uncertainty that voters face.

To test the hypothesis of positing women's political under-representation as an information problem, an ideal setting is a social experiment where voters and parties are exogenously exposed to female politicians. Such an exposure may better inform voters and parties of female politicians and provide a chance for later female candidates to compete in a fairer way with males. Then a virtuous cycle can occur. Based on the exact social experimental idea, Beaman et al. (2010) exploited the introduction of a gender quota policy in India and examined whether the mandated exposure to female politicians improved the electoral prospects for later female candidates. They also presented survey and psychological test results, showing that such positive impacts were driven by changes in voters' attitudes.

In this paper, we exploit random variation in the electoral outcomes for female candidates arising from a non-affirmative action natural experiment in a local council election in Korea. In Korea, for the 2006 election, which was based on a multi-member district system, ballot numbers were assigned to candidates according to the alphabetical order of their names when there were multiple candidates from a party. That peculiar rule increased elected female members in certain districts where female candidates were accidentally assigned to advantageous ballot numbers because of their favorable name order.[2] Since the alphabetical

[1] A competing hypothesis is that voters and political parties are biased against female politicians. This is the case of taste-based discrimination (Becker, 1957). It is difficult to test the hypothesis empirically because such bias is likely to be deeply rooted, perhaps in the subconscious, especially in a society where gender discrimination is politically incorrect. We will later discuss the possibility of taste-based gender discrimination in our context.

[2] The name order advantage in our setting occurs by an effect called as the primacy effect or position bias in the political science literature. There have been a number of empirical studies that have found the primacy effect in various elections in many countries.

order of candidates' names is presumably orthogonal to their political quality, which is also supported by the data, the setting is close to an ideal experiment where voters and parties are exogenously exposed to female politicians. That is, there happen to be more female council members elected in certain districts without any direct effect a policy like gender quota purports to have. It is possible in our setting to identify the pure effect of exposure and therefore to test the hypothesis that female political under-representation is a consequence of the deficiency of information about female politicians.

To sum up our main findings, we find that in those districts where more female candidates were elected accidentally due to their name-order advantage, there appeared more female candidates in the next election and their probability of winning significantly increased. However, we find that the positive impacts are significant only in the districts where no single party is dominant and, furthermore, the impacts are driven mainly by the incumbency advantage. This suggests that, in those competitive districts, parties just tried to take a competitive advantage of incumbents who happened to be females. In fact, we find no positive effect on non-incumbent female candidates. We even find some adverse impacts on independent female candidates and females in the districts where there is no competition between major parties. Our findings suggest that a simple exposure to female politicians might not work to correct the prejudice against female politicians.

The remaining of the paper proceeds as follows. In Section II, we provide literature review. Section III presents institutional background of local council elections in Korea. In Section IV, we introduce data and explain our empirical strategy. Section V presents main empirical findings and robustness check results, and Section VI concludes.

## II. Literature Review

Female empowerment has recently been a compelling issue discussed in economics literature. Crucial questions in the discussion are what effects empowered women would have on society and whether political instruments to buttress gender equality are necessary. Several studies have been conducted particularly on political situations where women are severely underrepresented. In these situations, it is common to reserve some proportion of legislative seats or spots on candidate lists for women as a form of affirmative action. While Duflo

(2012) discusses women empowerment in general, the following articles discuss the effects of female politicians or of reservation policies and their mechanisms.

Duflo (2012) focused on the interrelationships between female empowerment and economic development. According to her survey, economic development mitigates gender inequality by reducing excessive poverty and maternal mortality and by expanding women's job opportunities, spare time, and legal rights. In a converse direction, she also discussed a number of studies involving the positive effects of empowered females on households and societies more broadly as decision-makers. However, she argued that this virtuous cycle is not strong enough to sustain itself and may need continuous policy commitments from public institutions which favor women.

In political institutions, Chattopadhyay and Duflo (2004) explained how the gender of leaders affects their policy decisions under a female quota system using a dataset from India. The data encompassed a period before and after the enforcement of quotas in local village councils in India in 1993. The villages in which these quotas were implemented were chosen randomly, so the researchers could measure the reduced form effect of leaders' genders on the provision of various public goods. The results indicated that female leaders made public investments more focused on meeting the needs of women. The effect of gender on policy decisions did not arise from leaders being more responsive to the needs of villagers of the same gender, but instead from pro-female women being elected under the reservation policy.

Clots-Figueras (2012) studied the effects of the gender of politicians on actual educational outcomes in those politician's districts. Employing data from the same natural experiment that Chattopadhyay and Duflo (2004) used, he showed that female leadership brought about higher rates of primary education in urban areas, but not rural areas. The underlying mechanism causing this effect was that female leaders encouraged children to attend school and discouraged them from dropping out. To identify the causal effects of the femininity of leaders, they instrumented the share of female politicians with the share of female politicians who won in a close election against male candidates.

Along with the studies on how female leadership or reservation policies affect societies in which they are implemented, Beaman et al. (2009), De Paola et al. (2010), and Casas-Arce and Saiz (2015) discussed whether gender policies would be effective for increasing female representation. They suggest the effect of affirmative action is valid and

persistent. Under the aforementioned natural experiment in India, Beaman et al. (2009) found that reservation policies significantly improved women's electoral prospects in villages when the seat was reserved in two subsequent elections. Furthermore, they examined one consistent channel: changes in voter attitudes. They used survey and social scientific experiment to demonstrate how reservation improved villagers' evaluations of female leaders and broke down gender-occupation stereotypes. Although strong same-gender preferences remained unaffected, the above changes in attitudes played important roles in influencing voters' decisions.

Similarly, De Paola et al. (2010) analyzed data from Italy where gender quotas in local elections were enforced from 1993 to 1995. As the affirmative action was in force only during a short period of time, they had a proper control group where the action had never been applied. They found that female representation in local politics increased significantly in municipalities where reservation policies were enforced at least once. Furthermore, the effect persisted even after the abolition of the reservation policy, which was not attributed to any incumbency advantage or temporal or regional trends. They suggested that the effect was caused by forcing voters to break negative stereotypes about female politicians.

The preceding two articles assumed that voters preferred for male politicians, which Beaman et al. (2009) demonstrated experimentally. However, Casas-Arce and Saiz (2015) used data from Spain to show that women's under-representation was more likely due to discrimination by political parties, rather than voter bias or self-selection. First, they found that quotas in local Spanish governments passed in 2007 effectively increased the number of female politicians in affected parties. Then they tested three possible mechanisms which might explain female under-representation: voter preferences, female candidate supply, and discrimination by parties. Their results were consistent only with internal party dynamics as voter share with more female candidates under the quota system was not reduced and the parties did not struggle to find female candidates.

One of major concerns over affirmative actions is the possible entrance of unqualified female politicians. However, Baltrunaite et al. (2014) have shown that reservation policies in Italian municipalities increased the overall quality of politicians as measured by their education levels. Not only did elected women possess higher levels of education on average than their male counterparts, but also the number of less-educated male politicians went down. When they used alternative proxies for quality and controlled for political

ideology and competition, the result was consistent. Although their difference-in-difference estimation mainly focused on the short-run effect of such policies, it was found to also be effective in the long run.

## III. Institutional Background

In Korea, local council elections are held every four years since 1998 (i.e., the second election).[3] A local council, which consists of on average about 11 members depending upon population size, is mainly responsible for (i) review of local government decisions as a resident representative, (ii) deliberation of fiscal policies, public services, and many other issues related to organization and operation of local governments as a resolution authority, (iii) establishment of ordinances as a legislative body, and (iv) monitoring and surveillance of local government as an enforcement agency. There were 230 local councils in 2006 when the 4th election was held.

There were two major changes in the local council election system in the 4th election. Prior to the 4th election, the election system had been single-member district plurality (SMDP) voting, but it was changed to multi-member district plurality (MMDP) voting, under which there are multiple seats within districts. Unlike the standard multi-member district plurality voting, in the Korean system, voters have only one vote. Therefore, even if they have a party to support, when there are multiple candidates from the party, they have to decide one candidate from them. The system has been the MMDP voting since the 4th election.

Another change in the 4th election is that political parties can nominate candidates. Because of this change, a problem of how to assign ballot numbers occurred, especially when there were more than one candidate from a party. The rule, determined on August 4, 2005 under Article 150 Clause 5 of the Public Offices Election Law, is that a number should be assigned to a candidate according to his or her party affiliation. If there are multiple candidates nominated by a same party, then a sub-number is assigned according to the Korean alphabetical order of the candidate's name. For example, a candidate's party number is 2 and his or her name is 2nd in the name order, then the candidate's ballot number is 2-B

[3] The first election was held in 1995. The data that we use in this paper cover from the 3rd to 6th election (the latest one). The 1st election was held on June 27, 1995; the 2nd election on June 4, 1998; the 3rd election on June 13, 2002; the 4th election on May 31, 2006; the 5th election on June 2, 2010; and the 6th election on June 4, 2014.

(after 2-A). For independent candidates, the ballot numbers are assigned in the Korean alphabetical order followed by all party-nominated candidates.

Also, starting from the 4th election, voters can vote not only for individual candidates but also for parties by proportional representation (PR). PR is the electoral system under which a certain number of seats are allocated to each party's PR candidates according to the number of votes that the party received.

Figure 1 presents the ballots used in the 4th election. There are seven ballots each of which voters can make a choice on. Ballot form A is the ballot for voting for individual local council members. In the example ballot, there are two parties, 1 and 2, and each party has two candidates. They have different sub-symbols (가 and 나) in Korean, corresponding to A and B in our previous explanation. Ballot form B is the one used for PR voting. In the example, there are five parties.

< Figure 1>

# IV. Data and Empirical Strategy

## A. Data Construction

The data that we use come from multiple sources. First, we use the official election data provided by the National Election Commission. The data contain information on individual candidates and electoral outcomes. The candidate data include basic information on name, gender, birth date, party affiliation, and ballot number. The data also include brief curriculum vitae information that candidates choose to provide, from which we extract information on education and occupation. The voting outcome data provide the number of votes that each candidate received as well as ward-level information such as the number of registered voters, total valid votes, and invalid votes.

We use various data sets to construct control variables. First, we construct the variables such as the proportion of the college educated for each sex and the unemployment

rate by sex from the 10% sample of the Census provided by the National Statistical Office.[4] Since the Census in Korea is conducted every five years, we match the election data with the closest Census. For example, we match the 4th election data (2006) with the 2005 Census. Since the 2015 Census is not yet available, we match both the 5th and 6th election data with the 2010 Census. Also, because of the limitation on the geocode available in the Census, we match the two data sets at the council level rather than at the ward level. Lastly, using administrative resident registration data of the year one year ahead of each election, provided by the Ministry of the Interior, we construct the variables representing the sex composition of adult population and the age structure of residents at the council level. We control for those variables because gender bias might differ by demographic composition. We also compute the sex ratio of children under age 6. The sex ratio variable is a proxy for the extent of son preference, which is likely correlated with gender bias in general, including that associated with voting behavior.

Next, we obtain information on each local council's fiscal performance from the Local Finance Integrated Open System (http://lofin.moi.go.kr/portal/emain.do). We want to examine whether female council members make any difference in the local government's budgets and spending, such as the expenditure share for welfare programs or the fiscal self-reliance ratio.[5] By using the council spending data, we examine whether the presence of female members in the council make any difference in council budget allocation. Specifically, we are interested in checking whether female members put forward to more pro-female or pro-family policies.

In addition, we use the data from the General Social Survey (GSS), which is conducted annually by the National Statistical Office. The questionnaires of which were based on 3 to 4 out of 10 topics rotationally. We try to collect all the gender-related questions available for the period relevant to the local elections of our study. That is, we want to check whether female representation in local councils has affected perceptions or social norms, regarding traditional gender stereotypes or the status of women in the labor market and within the household. Specifically, we use the data from 1998, 2002, 2006, 2008, 2009, 2010, 2011, 2012, 2013, and 2014 and classify and combine the data from 1998, 2002 and 2006 as the

[4] Because of the multicollinearity problem, we control for population aggregate education levels and unemployment rates rather than those variables by sex separately.

[5] The fiscal self-reliance ratio is computed by the sum of local taxes and non-tax receipts divided by local government budgets.

data before the 4th election, those from 2008, 2009 and 2010 as the data after the 4th election (that is, respondents potentially affected by the outcomes of the 4th election), the rest of them as the data after the 5th election.

## B. Identifying Assumptions

A key identifying assumption of our empirical strategy is that sub-ballot numbers are randomly assigned to candidates. The ballot number assignment rules that we exploit in this paper were announced before parties nominated their candidates. Therefore, in principle, parties taking the ballot order effect into account could have selected candidates strategically. However, in reality, such strategic nomination seems unlikely in the 4th election. For the purpose, they should have nominated candidates selectively based on their name order. For example, if parties favored male candidates, then they should have nominated male candidates with the names earlier in the Korean alphabetical order than the names of female candidates.

Table 2 presents the distribution of last names in the basis of Korea's three most common last names (i.e., Kim, Lee, and Park) and three divided groups in the Korean alphabetical order.[6] The distributions of last names among candidates look quite similar to the population distribution regardless of elections. However, due to the primacy effect, which we particularly term *the name order effect* in this paper, the last names up to Kim are over-represented among the winners of the 4th election, while these patterns do not exist in any of the other elections.

Figure 2 shows that the proportion of female candidates according to their name order, that is, whether the last name is up to Kim or later. Among all candidates with the last name up to Kim, female candidates account for 4.5% while the proportion of female candidates among those with the last name after Kim is 5.1%. The difference is not statistically different from zero. The result is the same when we restrict the sample to those candidates affiliated with parties and with sub-ballot symbols, 3.8% versus 4.2%.

[6] According to Korea's 2000 Population Census, the three most common last names are Kim (about 21.6%), Lee (about 14.8%), and Park (about 8.5%). In the Korean alphabetical order, Kim is followed by Park, which is, in turn, followed by Lee.

We also check whether the name advantage is randomly assigned with respect to candidate characteristics, including sex. We create a dummy variable, which is one for those with the last name being up to Kim and zero for those with the last name after Kim. Table 3 presents the results. For the 4th election, the name advantage is not correlated with any of candidate characteristics. The same is true for the 6th election. For the 5th election, as a consequence of the 4th election, we find that incumbent candidates who were elected in the 4th election are more likely to have the last name up to Kim. That is, those with the last name up to Kim were more likely to be elected and nominated again for the 5th election. This shows exactly the primacy effect. In Table 4, we check the joint significance of candidate characteristics with respect to the name advantage. It turns out that few variables are significant independently despite only marginally, but they are not jointly significant except for the 5th election.

Figure 3 shows the probability of being assigned the first sub-ballot symbol by sex and the name advantage. Those female candidates with the last name up to Kim are about 58% points more likely to have the first sub-ballot symbol. This effect is slightly larger than the effect for male candidates, 52% points. The probability of being elected is much higher for those with the name advantage. The effect amounts to 37.9% points for female candidates, larger than 16.8% points for male candidates. That is, the name order effect is much larger for female candidates. On the other hand, we find no name order effect for either the 5th or 6th election when sub-ballot symbols were not assigned by the name order but freely decided by parties. To sum up, the results in this sub-section support our empirical strategy exploiting the name advantage as the instrument for the ratio of female elected members.

## C. Estimation Equation

The estimation equation is the following:

$$y_{ijt} = \beta_1 FV_{ij4} + \beta_2 FR_{ij4} + X_{ijt}\gamma + \mu_j + \epsilon_{ijt}$$

where dependent variable, $y_{it}$, represents a voting outcome for female candidates in ward $i$ of province $j$ in election $t$, $t =$ 5 or 6. We examine three outcomes; the ratio of female

candidates, the vote share that female candidates receive, and the ratio of female elected members to total seats allocated to the ward.

In this equation, we examine whether prior exposure to female politicians affects electoral gains for later female politicians by estimating $\beta_1$, the coefficient for $FV_{ij4}$. It is our key explanatory variable, representing the voting outcome for female candidates in the 4th election. In our baseline specification, we use the indicator of whether any female candidate was elected as the variable. As a robustness check, we alternatively use the ratio of female elected members. We estimate the equation for the 5th and 6th elections, separately. For the 5th election ($t = 5$), $\beta_1$ estimates the immediate effect of incumbent female politicians elected at the 4th election on the 5th election outcome. For the 6th election ($t = 6$), it estimates the persistent effect of exposure to female politicians one electoral cycle ago, capturing both an indirect effect via its impacts at the 5th election and a direct impact of the 4th election outcome.

There are a set of control variables. A key control variable is $FR_{ij4}$, which is the proportion of female candidates among all candidates in the 4th election. After controlling for this variable, we can interpret $\beta_1$ as the marginal effect of female winning in the previous election conditional upon the ratio of female candidates. Without the control variable, since female candidates win more seats as there are more female candidates, we cannot distinguish the effect of winning from that of more female candidates. Vector $X_{ijt}$ includes other control variables as well as a constant term, such as ward-level socioeconomic and demographic characteristics variables as explained in Section III.A. In addition, we control for province-specific fixed effects, $\mu_j$. Lastly, $\epsilon_{ijt}$ is the standard error term. We correct standard errors by clustering ward-level observations by province to address any correlation on unobservables within provinces.

Estimating the above equation, a key econometric challenge is the endogeneity of the previous electoral outcome, that is, $FV_{ij4}$ in our specification. Basically, $\beta_1$ is likely to be upwardly biased because there are unobservable factors about a ward which are positively correlated with the voting outcomes for female candidates in both the previous and current elections. In some districts, voters might be more open to female politicians than those in others. The concern may as well remain even after controlling for a number of variables, because it is difficult to control for voters' attitude toward female politicians and, in our case, the strategy of controlling for such a factor does not make sense since it is our hypothesis that voters' attitude might be changed by the exposure to female politicians.

We take the instrumental variable approach by exploiting random variation in the ratio of female elected members arising from the unique ballot assignment rule in the 4th election. Thus, the first-stage equation is as follows:

$$FV_{ij4} = \alpha \cdot Kim_{ij4} + \tilde{\beta}_2 FR_{ij4} + X_{ijt}\tilde{\gamma} + \tilde{\mu}_j + \tilde{\epsilon}_{ijt}$$

where $Kim_{ij4}$ is the instrumental variable. The variable is the proportion of candidates with the last name being up to Kim among those nominated by parties.[7] When we calculate the proportion, we exclude independent candidates and solely-nominated candidates because they do not have sub-ballot numbers.[8] The validity assumption of the instrument is that, conditional on the set of control variables, the proportion of particular last names among candidates does not affect the later election outcomes except through its impacts on the 4th election outcomes. The other variables are the same as those in the second-stage equation. The coefficients for those variables and the error term are distinguished from those in the second stage by the tilde. The name order effect means that $\alpha > 0$ for the 4th election. The coefficient should be zero for the other elections.

# V. Empirical Results

## A. Main Results

In this subsection, we present our estimation results, focusing on how the fact that a female candidate won her seat in the 4th election affects the later voting outcomes for female candidates. We examine three outcome variables; the ratio of female candidates, the vote share of female candidates, and whether any female candidate wins a seat in the 5th or 6th election. For each outcome, the estimates of our main interest are summarized in tables 5, 6 and 7, respectively. The full estimation results can be found in the appendix. In each table,

[7] We experimented with other definitions of the instrumental variable, for example, by dividing candidates into several name groups in the Korean alphabetical order, and found that the results are same.

[8] As a robustness check, we exclude those candidates without sub-ballot numbers from the beginning when we construct the ward-level data, and conduct the same regression analysis using the restricted sample. The results are qualitatively same as the results we present in the paper.

there are three panels; panel A shows the results for all districts, panel B for competitive districts where there are competing candidates from both major parties and panel C for non-competitive districts where one of major parties is dominant (no candidate from the other party). Columns (1) and (2) show the results for all candidates. Column (1) presents the OLS estimates, and (2) the IV estimates. The remaining columns from (3) to (5) present only the IV estimates. Column (3) presents the results for major party candidates, (4) for minor party candidates and (5) for independent candidates.

First, we find in table 5 that there are relatively more female candidates in the districts where any female candidate was elected in the previous election. In panel A, the OLS estimate shows that the fact that any female candidate was elected in the $4^{th}$ election increases the ratio of female candidates by 8.3%p in the $5^{th}$ election. This is a substantial increase given that the mean ratio was 9.5% in that election. The IV estimate in column (2) is even larger, 12%p. Columns (3) to (5) show that the increase is driven by an increase in female candidates from major parties. There is no significant effect for minor parties or independent candidates. Also the results in panels B and C show that the exposure effect on the ratio of female candidates exists only for competitive districts. For non-competitive districts, the results presented in panel C show that there is no significant effect even for major parties.

The results for competitive districts are intriguing. The results in panel B show that the exposure effect is significant and large not only for major parties but also for minor parties. More intriguingly, the exposure effect turns out to be negative for independent candidates. If any female candidates were elected in the $4^{th}$ election, the ratio of female independent candidates decreased by 2.8%p.

Table 6 presents the results for the vote share that female candidates receive. The table is structured in the exactly same way as is table 5. Also the implications of the results are same. The results in panel A show that any female candidates elected in the $4^{th}$ election increased the vote share that female candidates received in the $5^{th}$ election. The effect is significant only for major parties. The results also differ between competitive and non-competitive districts. In competitive districts, the exposure effect is significantly positive and large for major parties. But the exposure to female council members has a detrimental effect on independent female candidates in terms of vote share. In non-competitive districts, there is no significant exposure effect at all.

Table 7 presents the results for the ratio of female elected members in the council. In panel A, we find that having at least one female member elected in the 4th election does not increase the ratio of female council members in the 5th election. The OLS estimate in column (1) is upwardly biased, overestimating the exposure effect. The OLS estimate reflects the fact that the average proportion of female members from the 5th election is 26.3% in the treated districts while it was 8.8% in the control districts. The last column shows that the proportion of independent female members in the council dropped in the treated districts. As in tables 5 and 6, we separate the sample into competitive and non-competitive districts. As implied by the results in the previous tables, we find that the exposure effect is positive in competitive districts. The IV estimates in column (2) and (3), although marginally significant at the conventional 10% level, show that more female candidates were elected by the exposure and thus the proportion of female members increased, by about 10-11%p. The effect is substantial given that the average proportion of female members in the 5th election is only 10.6%.

On the other hand, in panel C, we find that the exposure effect is actually negative in non-competitive districts. The size of the effect is not ignorable. The prior exposure to female members decreased the ratio of female members by about 17%p, according to the estimate in column (2). It seems that the chance for independent female candidates to become council members decreased in both competitive and non-competitive districts.

## B. Robustness Checks

In this subsection, we conduct a few robustness checks. First, we restrict the sample by excluding independent candidates and solely-nominated candidates. These candidates do not have sub-ballot numbers and therefore they are not directly affected by the ballot number assignment rule. Second, we restrict the sample to the districts where there was at least one female candidate. Third, we control for potential impacts from female representation at the National Assembly (specifically, control for the indicator for whether there was a female candidate in the district at the National Assembly election and that for whether a female candidate was actually elected) and check the robustness of the results for local council elections.

## C. Council Budgets and Voters' Attitudes

TBA

# VI. Conclusions

TBA

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**Figure 1. Ballots in the 4th Election**

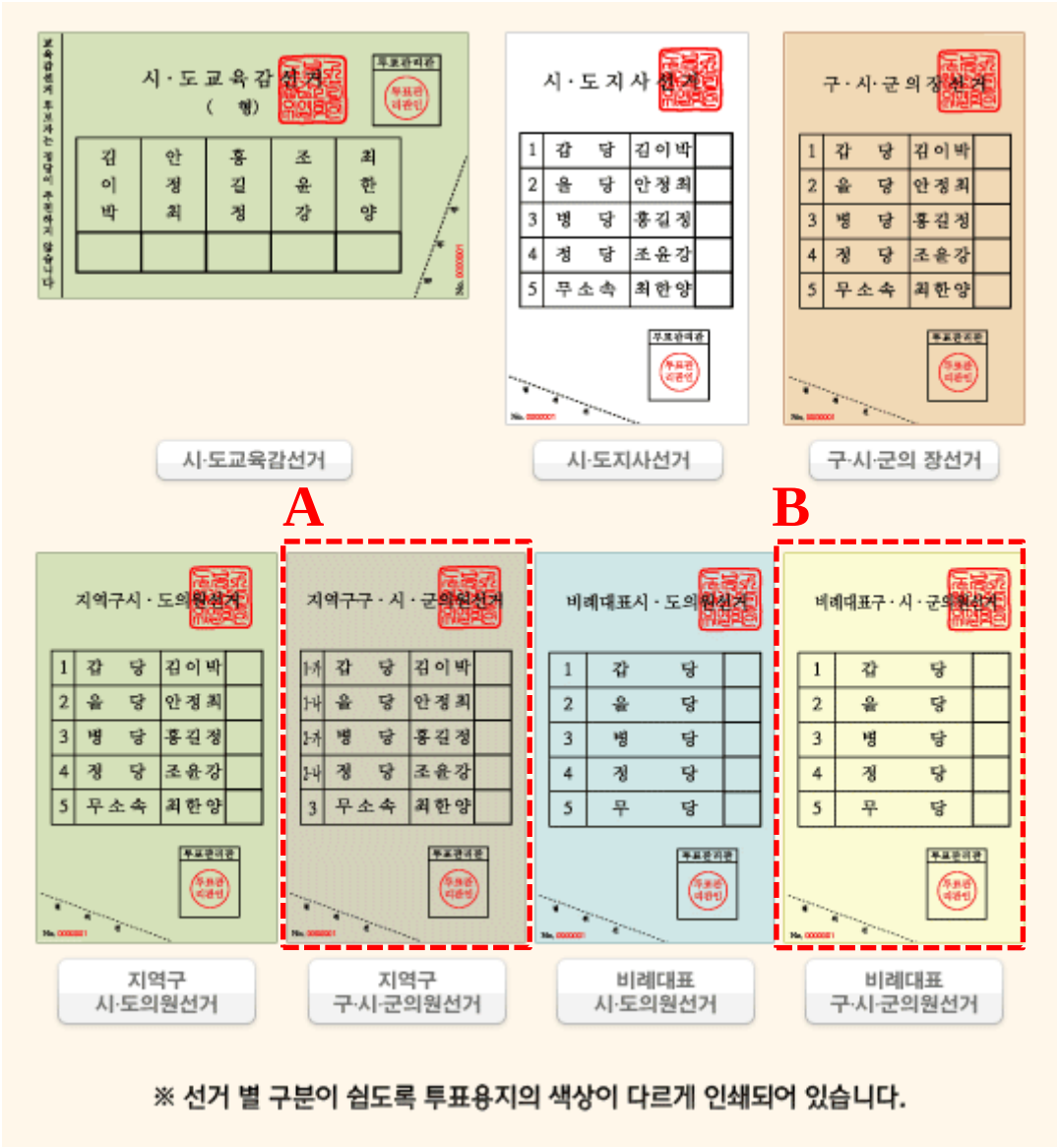
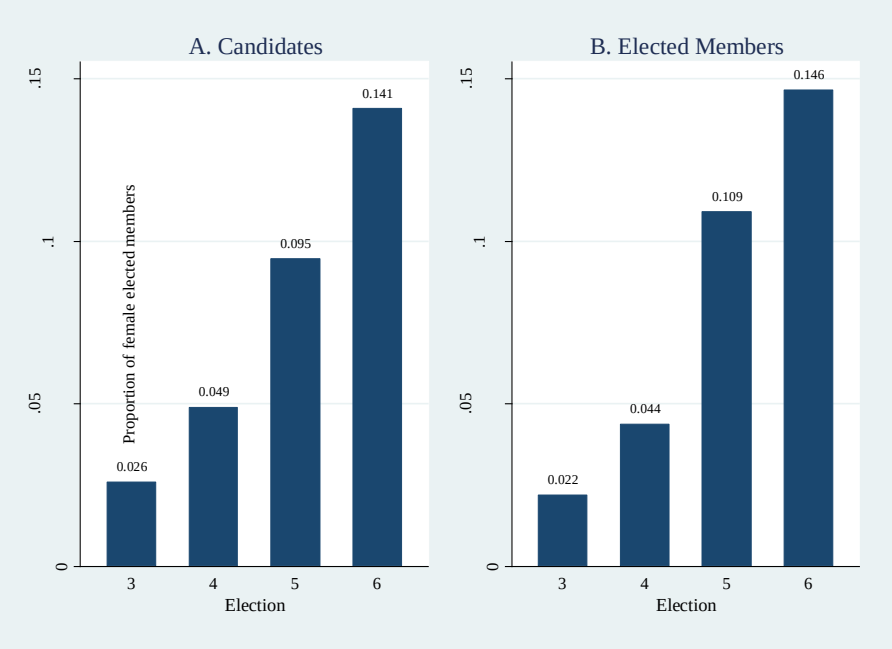


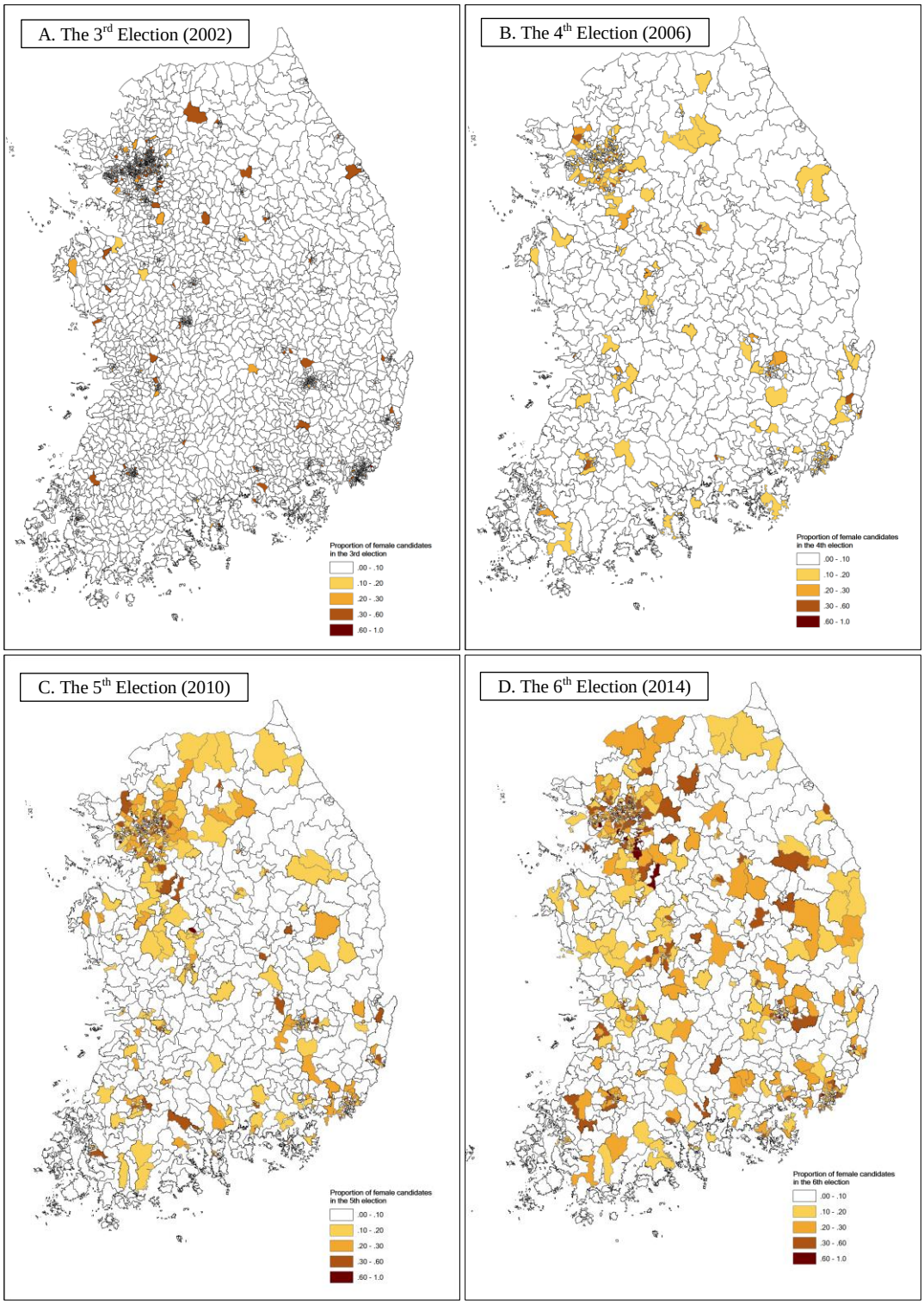
Figure 2. Proportions of Female Candidates and Elected Members by Election




*Note*: The diagrams present the proportions of female candidates and those of female elected members from the 3rd (2002) to 6th (2014) elections.

*Source*: National Election Commission

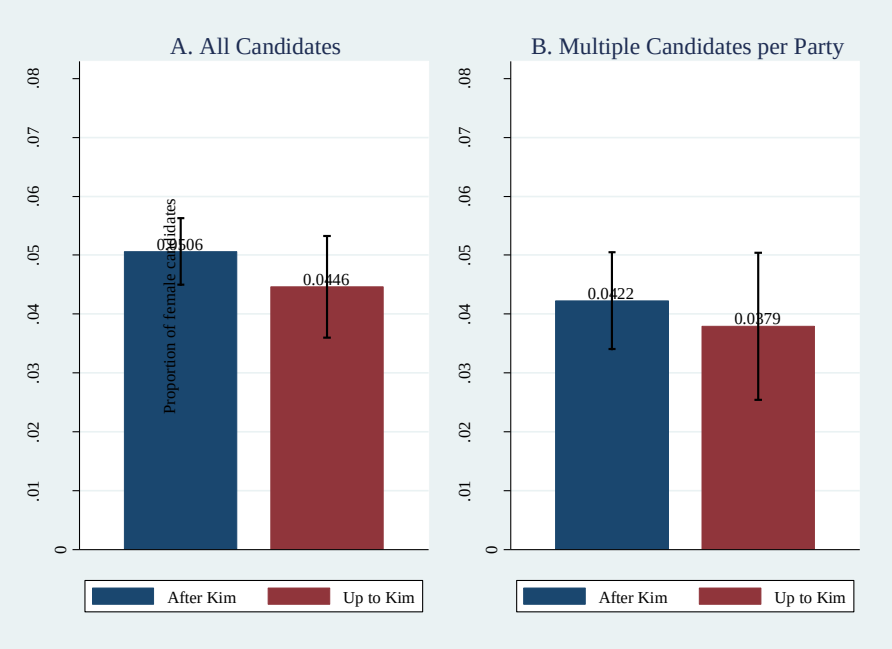
Figure 3. Ward-Level Proportions of Female Candidates by Election




*Note*: The maps describe the proportions of female candidates in the ward level from the 3rd to 6th elections. These ward-level maps are drawn with ArcGIS 12.0.

*Source*: Statistical Geographic Information Service of the National Statistics Office and National Election Commission

Figure 4. Proportions of Female Candidates by Last Name Advantage

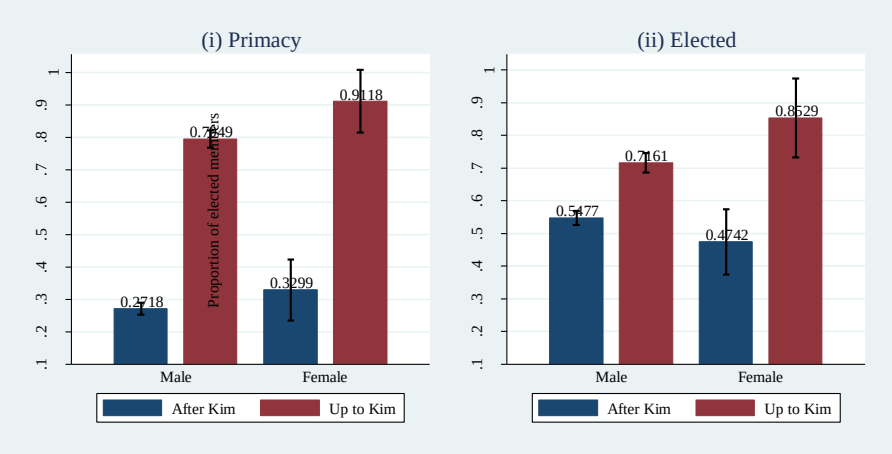



*Note*: The diagrams show the mean and the 95% confidence interval of the proportions of female candidates by last name ('after Kim' and 'up to Kim') in the 4th election (2006).

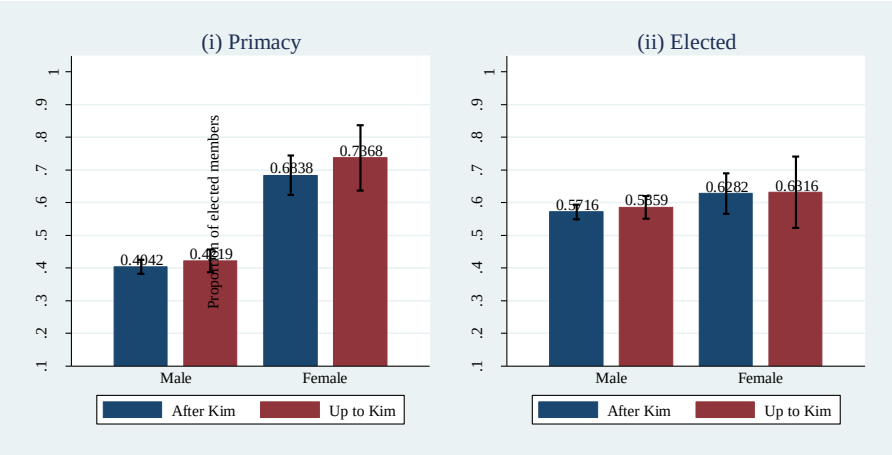
*Source*: National Election Commission

Figure 5. Last Name Advantage by Gender

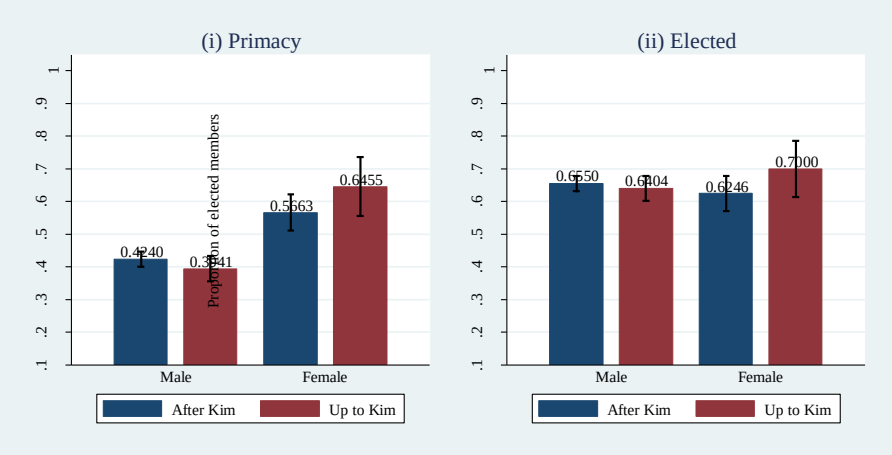
A. The 4th Election (2006)




B. The 5th Election (2010)




C. The 6th Election (2014)




*Note*: The left diagrams, A(i), B(i), and C(i), present the mean and the 95% confidence interval of the proportions of primacy number assigned by gender and last name ('after Kim' and 'up to Kim'), while the right diagrams, A(ii), B(ii), and C(ii), show those of the proportions of elected members by gender and last name.

*Source*: National Election Commission

Table 1. Descriptive Statistics of Candidates

| | Election (Year) | | | |
|---|---|---|---|---|
| | 3rd (2002) | 4th (2006) | 5th (2010) | 6th (2014) |
| A. Candidate characteristics | | | | |
| Female | 0.026 | 0.049 | 0.095 | 0.141 |
| Incumbent | 0.300 | 0.269 | 0.263 | 0.295 |
| Age 30's | 0.074 | 0.078 | 0.056 | 0.050 |
| Age 40's | 0.358 | 0.362 | 0.309 | 0.235 |
| Age 50's | 0.380 | 0.388 | 0.444 | 0.490 |
| Age 60's or above | 0.187 | 0.167 | 0.188 | 0.220 |
| Some college or higher | 0.374 | 0.561 | 0.691 | 0.773 |
| Missing education | 0.031 | 0.063 | 0.046 | 0.031 |
| Major party | − | 0.501 | 0.547 | 0.598 |
| Minor party | − | 0.093 | 0.154 | 0.073 |
| Independent | 1.000 | 0.405 | 0.298 | 0.329 |
| *N* = | 7,848 | 7,968 | 5,822 | 5,377 |
| B. Elected members characteristics | | | | |
| Female | 0.022 | 0.044 | 0.109 | 0.146 |
| Incumbent | 0.352 | 0.379 | 0.360 | 0.429 |
| Age 30's | 0.057 | 0.058 | 0.046 | 0.032 |
| Age 40's | 0.372 | 0.406 | 0.325 | 0.223 |
| Age 50s | 0.402 | 0.406 | 0.470 | 0.542 |
| Age 60's or above | 0.168 | 0.129 | 0.157 | 0.202 |
| Some college or higher | 0.382 | 0.621 | 0.745 | 0.809 |
| Missing education | 0.030 | 0.045 | 0.035 | 0.023 |
| Major party | − | 0.866 | 0.779 | 0.871 |
| Minor party | − | 0.043 | 0.099 | 0.019 |
| Independent | 1.000 | 0.091 | 0.121 | 0.110 |
| *N* = | 3,511 | 2,515 | 2,512 | 2,519 |

*Note*: Using the socio-demographic information of individual candidates as well as elected members, we compute the summary statistics for each election.

Table 2. Distribution of Last Names

| Candidates | Last name | Census | Election (Year) 3rd (2002) | 4th (2006) | 5th (2010) | 6th (2014) |
|---|---|---|---|---|---|---|
| A. All candidates | *Prior to* Kim | 0.062 | 0.063 | 0.064 | 0.064 | 0.057 |
| | Kim | 0.216 | 0.205 | 0.212 | 0.214 | 0.211 |
| | *After* Kim and *prior to* Park | 0.033 | 0.037 | 0.030 | 0.039 | 0.040 |
| | Park | 0.085 | 0.085 | 0.084 | 0.086 | 0.088 |
| | *After* Park and *prior to* Lee | 0.195 | 0.189 | 0.192 | 0.191 | 0.197 |
| | Lee | 0.148 | 0.151 | 0.152 | 0.155 | 0.151 |
| | *N* = | 45,976,335 | 7,848 | 7,968 | 5,822 | 5,377 |
| B. Multiple candidates | *Prior to* Kim | | | 0.065 | 0.066 | 0.054 |
| | Kim | | | 0.216 | 0.213 | 0.209 |
| | *After* Kim and *prior to* Park | | | 0.030 | 0.039 | 0.040 |
| | Park | | | 0.083 | 0.091 | 0.083 |
| | *After* Park and *prior to* Lee | | | 0.193 | 0.190 | 0.198 |
| | Lee | | | 0.151 | 0.155 | 0.162 |
| | *N* = | | | 3,194 | 3,025 | 2,738 |
| C. Elected members | *Prior to* Kim | | | 0.086 | 0.064 | 0.056 |
| | Kim | | | 0.255 | 0.219 | 0.206 |
| | *After* Kim and *prior to* Park | | | 0.031 | 0.037 | 0.043 |
| | Park | | | 0.090 | 0.097 | 0.084 |
| | *After* Park and *prior to* Lee | | | 0.191 | 0.189 | 0.198 |
| | Lee | | | 0.139 | 0.154 | 0.158 |
| | *N* = | | | 1,898 | 1,758 | 1,780 |

*Note*: Each column presents the distribution of last names in the census and election data, in the basis of Korea's three most common last names (i.e., Kim, Lee, and Park) and three divided groups in the Korean alphabetical order. In the Korean alphabetical order, Kim is followed by Park, which is, in turn, followed by Lee.

*Source*: 2000 Population Census of the National Statistics Office and National Election Commission

Table 3. Randomness of Last Name Advantage

| | Dependent Variable | | |
|---|---|---|---|
| | *Kim* in Election (Year) | | |
| | 4th (2006) | 5th (2010) | 6th (2014) |
| Variables | (1) | (2) | (3) |
| Female | -0.028 | -0.015 | -0.003 |
| | (0.041) | (0.027) | (0.024) |
| Incumbent | -0.019 | 0.106*** | 0.005 |
| | (0.016) | (0.018) | (0.018) |
| Age 30's | 0.094 | -0.019 | -0.065 |
| | (0.177) | (0.193) | (0.181) |
| Age 40's | 0.057 | -0.125 | -0.014 |
| | (0.175) | (0.190) | (0.176) |
| Age 50's | 0.069 | -0.123 | -0.045 |
| | (0.175) | (0.190) | (0.175) |
| Age 60's or above | 0.034 | -0.120 | -0.050 |
| | (0.176) | (0.190) | (0.176) |
| Some college or higher | -0.015 | -0.013 | 0.004 |
| | (0.018) | (0.022) | (0.023) |
| Missing education | -0.069* | 0.069 | -0.026 |
| | (0.037) | (0.047) | (0.051) |
| Constant | 0.241 | 0.371* | 0.299* |
| | (0.176) | (0.190) | (0.176) |
| Joint significance | 0.349 | $p < 0.01$ | 0.922 |
| Observations | 3,194 | 3,025 | 2,738 |
| *R*-squared | 0.017 | 0.027 | 0.010 |

*Note*: The dependent variable *Kim* is the indicator of whether the candidate's last name is Kim or ahead in the Korean alphabetical order. The linear probability model is estimated. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 4. Name Order Effects in the 4th Election

| | Dependent Variable: In the 4th Election (2006) | | | |
|---|---|---|---|---|
| | Vote Share | Elected | Vote Share | Elected |
| | All Candidates | | Multiple Candidates | |
| Variables | (1) | (2) | (3) | (4) |
| *Kim* | 0.013*** | 0.064*** | 0.036*** | 0.177*** |
| | (0.001) | (0.008) | (0.002) | (0.016) |
| Female | 0.002 | -0.007 | -0.008 | -0.036 |
| | (0.003) | (0.019) | (0.006) | (0.039) |
| Incumbent | 0.027*** | 0.110*** | 0.024*** | 0.147*** |
| | (0.002) | (0.010) | (0.002) | (0.017) |
| Age 30's | 0.005 | 0.043 | 0.012 | 0.137 |
| | (0.007) | (0.042) | (0.024) | (0.161) |
| Age 40's | 0.009 | 0.054 | 0.013 | 0.127 |
| | (0.007) | (0.041) | (0.024) | (0.157) |
| Age 50's | 0.009 | 0.041 | 0.011 | 0.105 |
| | (0.007) | (0.041) | (0.024) | (0.157) |
| Age 60's or above | -0.002 | -0.003 | 0.000 | 0.045 |
| | (0.007) | (0.042) | (0.024) | (0.157) |
| Some college | 0.006*** | 0.025*** | 0.013*** | 0.050*** |
| | (0.001) | (0.009) | (0.002) | (0.018) |
| Graduate degree | 0.004* | 0.005 | 0.014*** | 0.024 |
| | (0.002) | (0.014) | (0.004) | (0.026) |
| Missing education | -0.000 | -0.002 | 0.007 | 0.022 |
| | (0.003) | (0.015) | (0.006) | (0.039) |
| Number of seats | -0.018*** | 0.037*** | -0.030*** | 0.030** |
| | (0.001) | (0.003) | (0.002) | (0.013) |
| Number of candidates | -0.007*** | -0.009*** | -0.009*** | -0.009*** |
| | (0.000) | (0.001) | (0.001) | (0.003) |
| Constant | 0.216*** | 0.199*** | 0.299*** | 0.354** |
| | (0.008) | (0.042) | (0.025) | (0.159) |
| Observations | 7,964 | 7,968 | 3,192 | 3,194 |
| *R*-squared | 0.658 | 0.420 | 0.564 | 0.209 |

*Note*: The dependent variable is the candidate's vote share in the 4th election for columns (1) and (3) and whether the candidate is elected in the 4th election in columns (2) and (4). To compute the dependent variables, columns (1) and (2) include all candidates and columns (3) and (4) contain only those nominated by a party while there are other candidates nominated by the same party. The variable *Kim* is the indicator of whether the candidate's last name is Kim or ahead in the Korean alphabetical order. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 5. Impacts on the Ratio of Female Candidates in the 5th Election

| | Dependent Variable: Female Ratio in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| A. All districts | | | | | |
| Female elected in the 4th election | 0.083*** | 0.120** | 0.111** | 0.017 | -0.008 |
| | (0.018) | (0.055) | (0.043) | (0.020) | (0.018) |
| First-stage test statistics | – | 157.244 | 157.244 | 157.244 | 157.244 |
| Observations | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| *R*-squared | 0.278 | 0.158 | 0.084 | 0.070 | 0.009 |
| B. Competitive districts | | | | | |
| Female elected in the 4th election | 0.098*** | 0.163*** | 0.153*** | 0.038** | -0.028*** |
| | (0.019) | (0.051) | (0.039) | (0.016) | (0.008) |
| First-stage test statistics | – | 96.127 | 96.127 | 96.127 | 96.127 |
| Observations | 564 | 564 | 564 | 564 | 564 |
| *R*-squared | 0.261 | 0.160 | 0.089 | 0.066 | 0.003 |
| C. Non-competitive districts | | | | | |
| Female elected in the 4th election | 0.050** | 0.032 | 0.003 | -0.016 | 0.045 |
| | (0.022) | (0.091) | (0.048) | (0.034) | (0.038) |
| First-stage test statistics | – | 56.100 | 56.100 | 56.100 | 56.100 |
| Observations | 469 | 467 | 467 | 467 | 467 |
| *R*-squared | 0.212 | 0.138 | 0.046 | 0.113 | 0.054 |

*Note*: The dependent variable is the proportion of female candidates in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Panel A covers all districts while panel B and C focus on competitive and non-competitive districts, respectively. The full results are available in Appendix A. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 6. Impacts on Female Candidates' Vote Share in the 5th Election

| | Dependent Variable: Female Vote Share in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| A. All districts | | | | | |
| Female elected in the 4th election | 0.107*** | 0.126** | 0.133*** | -0.002 | -0.006 |
| | (0.020) | (0.060) | (0.051) | (0.019) | (0.011) |
| First-stage test statistics | − | 189.541 | 189.541 | 189.541 | 189.541 |
| Observations | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| *R*-squared | 0.225 | 0.141 | 0.079 | 0.054 | 0.000 |
| B. Competitive districts | | | | | |
| Female elected in the 4th election | 0.123*** | 0.197*** | 0.194*** | 0.018 | -0.015*** |
| | (0.020) | (0.055) | (0.038) | (0.023) | (0.005) |
| First-stage test statistics | − | 105.664 | 105.664 | 105.664 | 105.664 |
| Observations | 564 | 564 | 564 | 564 | 564 |
| *R*-squared | 0.215 | 0.150 | 0.072 | 0.092 | -0.017 |
| C. Non-competitive districts | | | | | |
| Female elected in the 4th election | 0.062 | -0.066 | -0.055 | -0.037 | 0.026 |
| | (0.036) | (0.104) | (0.060) | (0.039) | (0.028) |
| First-stage test statistics | − | 79.376 | 79.376 | 79.376 | 79.376 |
| Observations | 469 | 467 | 467 | 467 | 467 |
| *R*-squared | 0.249 | 0.058 | -0.024 | 0.102 | 0.052 |

*Note*: The dependent variable is female candidates' vote share in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Panel A covers all districts while panel B and C focus on competitive and non-competitive districts, respectively. The full results are available in Appendix B. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 7. Impacts on Female Candidates' Winning Seats in the 5th Election

| | Dependent Variable: Female Elected Ratio in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| A. All districts | | | | | |
| Female elected in the 4th election | 0.124*** | 0.020 | 0.044 | -0.014 | -0.010** |
| | (0.028) | (0.072) | (0.075) | (0.026) | (0.004) |
| First-stage test statistics | – | 168.017 | 168.017 | 168.017 | 168.017 |
| Observations | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| *R*-squared | 0.186 | 0.086 | 0.062 | 0.025 | -0.014 |
| B. Competitive districts | | | | | |
| Female elected in the 4th election | 0.156*** | 0.108* | 0.113 | 0.003 | -0.008* |
| | (0.035) | (0.058) | (0.075) | (0.030) | (0.005) |
| First-stage test statistics | – | 104.901 | 104.901 | 104.901 | 104.901 |
| Observations | 564 | 564 | 564 | 564 | 564 |
| *R*-squared | 0.164 | 0.107 | 0.075 | 0.050 | -0.007 |
| C. Non-competitive districts | | | | | |
| Female elected in the 4th election | 0.063 | -0.174** | -0.132** | -0.028 | -0.014* |
| | (0.042) | (0.087) | (0.053) | (0.054) | (0.008) |
| First-stage test statistics | – | 57.974 | 57.974 | 57.974 | 57.974 |
| Observations | 469 | 467 | 467 | 467 | 467 |
| *R*-squared | 0.200 | -0.011 | -0.055 | 0.083 | -0.008 |

*Note*: The dependent variable is the proportion of female elected members in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Panel A covers all districts while panel B and C focus on competitive and non-competitive districts, respectively. The full results are available in Appendix C. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 8. Results After Controlling for the Impacts of Female Politicians

| | Dependent Variable: In the 5th Election (2010) | | |
|---|---|---|---|
| | Female Ratio | Female Vote Share | Female Elected |
| Variables | (1) | (2) | (3) |
| A. All districts | | | |
| Female elected in the 4th election | 0.115** | 0.123** | 0.017 |
| | (0.056) | (0.059) | (0.072) |
| Female candidates at National Assembly | 0.149* | 0.204** | 0.369** |
| | (0.086) | (0.102) | (0.146) |
| Females elected for National Assembly | 0.024*** | 0.020** | 0.015 |
| | (0.005) | (0.009) | (0.013) |
| First-stage test statistics | 157.433 | 191.186 | 168.651 |
| Observations | 1,033 | 1,033 | 1,033 |
| *R*-squared | 0.170 | 0.146 | 0.086 |
| B. Competitive districts | | | |
| Female elected in the 4th election | 0.158*** | 0.194*** | 0.103* |
| | (0.051) | (0.048) | (0.058) |
| Female candidates at National Assembly | 0.101 | 0.147 | 0.229* |
| | (0.085) | (0.109) | (0.120) |
| Females elected for National Assembly | 0.030*** | 0.033*** | 0.030* |
| | (0.005) | (0.009) | (0.017) |
| First-stage test statistics | 95.783 | 106.29 | 104.56 |
| Observations | 564 | 564 | 564 |
| *R*-squared | 0.176 | 0.162 | 0.110 |
| C. Non-competitive districts | | | |
| Female elected in the 4th election | 0.023 | -0.067 | -0.173** |
| | (0.089) | (0.104) | (0.088) |
| Female candidates at National Assembly | 0.250* | 0.390* | 0.662** |
| | (0.151) | (0.229) | (0.290) |
| Females elected for National Assembly | 0.015 | 0.005 | -0.001 |
| | (0.009) | (0.012) | (0.016) |
| First-stage test statistics | 55.072 | 76.292 | 56.754 |
| Observations | 467 | 467 | 467 |
| *R*-squared | 0.142 | 0.057 | -0.010 |

*Note*: For the dependent variable, column (1) exploits the proportion of female candidates in the 5th election; column (2) uses the vote share of female candidates in the 5th election; and column (3) adopts the proportion of female elected members in the 5th election. Panel A covers all districts while panel B and C focus on competitive and non-competitive districts, respectively. All columns provide IV estimates. Panel A covers all districts while panel B and C focus on competitive and non-competitive districts, respectively. The full results are available in Appendix D. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 9. Regression Results after Excluding Incumbents

| | Dependent Variable: In the 5th Election (2010) | | | | | |
|---|---|---|---|---|---|---|
| | Female Ratio | | Female Vote Share | | Female Elected | |
| | All | Major | All | Major | All | Major |
| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
| A. All districts | | | | | | |
| Female elected in the 4th election | 0.020 | -0.001 | 0.014 | 0.013 | -0.028 | -0.032 |
| | (0.049) | (0.035) | (0.040) | (0.045) | (0.048) | (0.056) |
| First-stage test statistics | 157.202 | 157.202 | 189.853 | 189.853 | 167.909 | 167.909 |
| Observations | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| *R*-squared | 0.067 | 0.038 | 0.054 | 0.030 | 0.054 | 0.037 |
| B. Competitive districts | | | | | | |
| Female elected in the 4th election | 0.068 | 0.049* | 0.069*** | 0.052 | 0.019 | -0.003 |
| | (0.047) | (0.029) | (0.021) | (0.036) | (0.042) | (0.065) |
| First-stage test statistics | 96.035 | 96.035 | 105.837 | 105.837 | 104.764 | 104.764 |
| Observations | 564 | 564 | 564 | 564 | 564 | |
| *R*-squared | 0.048 | 0.031 | 0.030 | 0.021 | 0.042 | 0.038 |
| C. Non-competitive districts | | | | | | |
| Female elected in the 4th election | -0.076 | -0.114*** | -0.121** | -0.093** | -0.113* | -0.098** |
| | (0.084) | (0.036) | (0.061) | (0.042) | (0.068) | (0.043) |
| First-stage test statistics | 56.167 | 56.167 | 79.524 | 79.524 | 58.003 | 58.003 |
| Observations | 469 | 467 | 467 | 467 | 467 | 467 |
| *R*-squared | 0.060 | -0.031 | 0.053 | -0.044 | 0.074 | -0.003 |

*Note*: For the dependent variable, columns (1) and (2) exploit the proportion of female candidates in the 5th election; columns (3) and (4) use the vote share of female candidates in the 5th election ; and columns (5) and (6) adopt the proportion of female elected members in the 5th election. For computation, columns (1), (3), and (5) include all female candidates, but columns (2), (4), and (6) contain those nominated by major parties. All columns provide IV estimates. Panel A covers all districts while panel B and C focus on competitive and non-competitive districts, respectively. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

## Appendix A. Full Results of Table 5

Table 5A. Impacts on the Ratio of Female Candidates in the 5th Election: All Districts

| | Dependent Variable: Female Ratio in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| Female elected in the 4th election | 0.083*** | 0.120** | 0.111** | 0.017 | -0.008 |
| | (0.018) | (0.055) | (0.043) | (0.020) | (0.018) |
| Female candidate ratio in the 4th election | 0.214*** | 0.144* | 0.011 | 0.100** | 0.033 |
| | (0.042) | (0.087) | (0.053) | (0.041) | (0.033) |
| Log of voters | 0.049*** | 0.049*** | 0.027*** | 0.015*** | 0.007* |
| | (0.010) | (0.009) | (0.007) | (0.005) | (0.004) |
| Female adult ratio | 0.257 | 0.260 | 0.717*** | -0.096 | -0.361 |
| | (0.458) | (0.435) | (0.184) | (0.161) | (0.275) |
| Sex ratio at birth | -0.027 | -0.034 | 0.011 | -0.045* | -0.000 |
| | (0.053) | (0.056) | (0.059) | (0.027) | (0.031) |
| Residents with college or higher | -0.040 | -0.029 | -0.133* | -0.009 | 0.113 |
| | (0.157) | (0.147) | (0.081) | (0.053) | (0.090) |
| Employment rate | 0.083** | 0.074** | 0.064** | 0.021 | -0.011 |
| | (0.036) | (0.036) | (0.030) | (0.040) | (0.012) |
| Younger residents in 20s and 30s | 0.338* | 0.307* | 0.190** | 0.030 | 0.088 |
| | (0.158) | (0.173) | (0.094) | (0.076) | (0.177) |
| Older residents aged 60 or older | 0.061 | 0.051 | -0.046 | -0.050 | 0.148*** |
| | (0.089) | (0.085) | (0.087) | (0.061) | (0.050) |
| First-stage test statistics | – | 157.244 | 157.244 | 157.244 | 157.244 |
| Observations | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| *R*-squared | 0.278 | 0.158 | 0.084 | 0.070 | 0.009 |

*Note*: The dependent variable is the proportion of female candidates in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 5B. Impacts on the Ratio of Female Candidates in the 5th Election: Competitive Districts

| | Dependent Variable: Female Ratio in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| Female elected in the 4th election | 0.098*** | 0.163*** | 0.153*** | 0.038** | -0.028*** |
| | (0.019) | (0.051) | (0.039) | (0.016) | (0.008) |
| Female candidate ratio in the 4th election | 0.222*** | 0.099 | -0.009 | 0.054* | 0.054** |
| | (0.023) | (0.092) | (0.067) | (0.032) | (0.024) |
| Log of voters | 0.061*** | 0.059*** | 0.030*** | 0.022*** | 0.008 |
| | (0.014) | (0.012) | (0.010) | (0.006) | (0.007) |
| Female adult ratio | -0.236 | -0.219 | 0.779** | -0.036 | -0.963*** |
| | (0.736) | (0.709) | (0.307) | (0.324) | (0.366) |
| Sex ratio at birth | -0.049 | -0.072 | -0.088 | -0.061 | 0.078 |
| | (0.061) | (0.076) | (0.109) | (0.041) | (0.055) |
| Residents with college or higher | 0.032 | 0.052 | -0.124 | -0.030 | 0.205* |
| | (0.206) | (0.181) | (0.090) | (0.071) | (0.124) |
| Employment rate | 0.094 | 0.075 | 0.092* | 0.004 | -0.021 |
| | (0.066) | (0.065) | (0.054) | (0.094) | (0.024) |
| Younger residents in 20s and 30s | 0.330 | 0.272 | 0.108 | 0.201** | -0.038 |
| | (0.290) | (0.297) | (0.124) | (0.097) | (0.235) |
| Older residents aged 60 or older | 0.116 | 0.076 | -0.131 | 0.080 | 0.127 |
| | (0.179) | (0.180) | (0.124) | (0.057) | (0.087) |
| First-stage test statistics | − | 96.127 | 96.127 | 96.127 | 96.127 |
| Observations | 564 | 564 | 564 | 564 | 564 |
| *R*-squared | 0.261 | 0.160 | 0.089 | 0.066 | 0.003 |

*Note*: The dependent variable is the proportion of female candidates in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 5C. Impacts on the Ratio of Female Candidates in the 5th Election: Non-competitive Districts

| | Dependent Variable: Female Ratio in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| Female elected in the 4th election | 0.050** | 0.032 | 0.003 | -0.016 | 0.045 |
| | (0.022) | (0.091) | (0.048) | (0.034) | (0.038) |
| Female candidate ratio in the 4th election | 0.207* | 0.239 | 0.088 | 0.179** | -0.029 |
| | (0.097) | (0.155) | (0.074) | (0.079) | (0.077) |
| Log of voters | 0.037*** | 0.037*** | 0.015* | 0.009 | 0.014*** |
| | (0.011) | (0.011) | (0.008) | (0.007) | (0.005) |
| Female adult ratio | 0.422 | 0.442 | 0.566* | -0.239 | 0.115 |
| | (0.412) | (0.420) | (0.292) | (0.156) | (0.197) |
| Sex ratio at birth | -0.053 | -0.051 | 0.037 | -0.023 | -0.065 |
| | (0.081) | (0.075) | (0.066) | (0.029) | (0.049) |
| Residents with college or higher | -0.096 | -0.097 | -0.019 | -0.091 | 0.013 |
| | (0.087) | (0.080) | (0.111) | (0.125) | (0.069) |
| Employment rate | 0.057 | 0.062 | 0.020 | 0.047 | -0.004 |
| | (0.038) | (0.044) | (0.029) | (0.043) | (0.026) |
| Younger residents in 20s and 30s | 0.099 | 0.117 | 0.269** | -0.400*** | 0.248 |
| | (0.326) | (0.285) | (0.132) | (0.116) | (0.198) |
| Older residents aged 60 or older | -0.128 | -0.125 | 0.037 | -0.346*** | 0.183*** |
| | (0.157) | (0.141) | (0.098) | (0.132) | (0.060) |
| First-stage test statistics | − | 56.100 | 56.100 | 56.100 | 56.100 |
| Observations | 469 | 467 | 467 | 467 | 467 |
| *R*-squared | 0.212 | 0.138 | 0.046 | 0.113 | 0.054 |

*Note*: The dependent variable is the proportion of female candidates in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

## Appendix B. Full Results of Table 6

Table 6A. Impacts on the Ratio of Female Candidates' Vote Share in the 5th Election: All Districts

| | Dependent Variable: Female Vote Share in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| Female elected in the 4th election | 0.107*** | 0.126** | 0.133*** | -0.002 | -0.006 |
| | (0.020) | (0.060) | (0.051) | (0.019) | (0.011) |
| Female candidate ratio in the 4th election | 0.237*** | 0.202* | 0.038 | 0.139*** | 0.025 |
| | (0.056) | (0.109) | (0.070) | (0.053) | (0.023) |
| Log of voters | 0.061*** | 0.061*** | 0.043*** | 0.014** | 0.005 |
| | (0.016) | (0.015) | (0.014) | (0.006) | (0.003) |
| Female adult ratio | 0.846** | 0.850*** | 1.083*** | -0.077 | -0.156 |
| | (0.311) | (0.299) | (0.277) | (0.227) | (0.151) |
| Sex ratio at birth | 0.091 | 0.082 | 0.076 | 0.010 | -0.004 |
| | (0.119) | (0.117) | (0.114) | (0.070) | (0.031) |
| Residents with college or higher | -0.101 | -0.096 | -0.133 | -0.016 | 0.053 |
| | (0.101) | (0.094) | (0.081) | (0.071) | (0.058) |
| Employment rate | 0.059 | 0.053 | -0.012 | 0.067 | -0.002 |
| | (0.050) | (0.048) | (0.064) | (0.057) | (0.015) |
| Younger residents in 20s and 30s | 0.118 | 0.092 | 0.027 | 0.039 | 0.026 |
| | (0.247) | (0.214) | (0.223) | (0.161) | (0.083) |
| Older residents aged 60 or older | -0.128 | -0.136 | -0.120 | -0.098 | 0.082*** |
| | (0.152) | (0.135) | (0.136) | (0.112) | (0.020) |
| First-stage test statistics | – | 189.541 | 189.541 | 189.541 | 189.541 |
| Observations | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| *R*-squared | 0.225 | 0.141 | 0.079 | 0.054 | 0.000 |

*Note*: The dependent variable is female candidates' vote share in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 6B. Impacts on the Ratio of Female Candidates' Vote Share in the 5th Election: Competitive Districts

| | Dependent Variable: Female Vote Share in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| Female elected in the 4th election | 0.123*** | 0.197*** | 0.194*** | 0.018 | -0.015*** |
| | (0.020) | (0.055) | (0.038) | (0.023) | (0.005) |
| Female candidate ratio in the 4th election | 0.282*** | 0.145 | 0.011 | 0.098*** | 0.035** |
| | (0.043) | (0.132) | (0.091) | (0.038) | (0.016) |
| Log of voters | 0.076*** | 0.076*** | 0.054*** | 0.016** | 0.005 |
| | (0.022) | (0.019) | (0.019) | (0.007) | (0.004) |
| Female adult ratio | 0.677 | 0.681* | 0.911*** | 0.195 | -0.425*** |
| | (0.415) | (0.373) | (0.347) | (0.352) | (0.153) |
| Sex ratio at birth | 0.067 | 0.021 | -0.100 | 0.065 | 0.057 |
| | (0.186) | (0.199) | (0.229) | (0.071) | (0.047) |
| Residents with college or higher | -0.080 | -0.053 | -0.059 | -0.092 | 0.098 |
| | (0.119) | (0.095) | (0.072) | (0.063) | (0.070) |
| Employment rate | 0.095 | 0.073 | -0.005 | 0.088 | -0.010 |
| | (0.065) | (0.069) | (0.118) | (0.072) | (0.012) |
| Younger residents in 20s and 30s | 0.164 | 0.050 | -0.238 | 0.315*** | -0.027 |
| | (0.350) | (0.294) | (0.211) | (0.055) | (0.113) |
| Older residents aged 60 or older | -0.022 | -0.071 | -0.264 | 0.110 | 0.083** |
| | (0.198) | (0.184) | (0.187) | (0.071) | (0.034) |
| First-stage test statistics | – | 105.664 | 105.664 | 105.664 | 105.664 |
| Observations | 564 | 564 | 564 | 564 | 564 |
| *R*-squared | 0.215 | 0.150 | 0.072 | 0.092 | -0.017 |

*Note*: The dependent variable is female candidates' vote share in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 6C. Impacts on the Ratio of Female Candidates' Vote Share in the 5th Election: Non-competitive Districts

| | Dependent Variable: Female Vote Share in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| Female elected in the 4th election | 0.062 | -0.066 | -0.055 | -0.037 | 0.026 |
| | (0.036) | (0.104) | (0.060) | (0.039) | (0.028) |
| Female candidate ratio in the 4th election | 0.148 | 0.389* | 0.178 | 0.224 | -0.013 |
| | (0.155) | (0.230) | (0.122) | (0.146) | (0.068) |
| Log of voters | 0.041* | 0.036 | 0.007 | 0.020 | 0.009 |
| | (0.020) | (0.022) | (0.016) | (0.014) | (0.007) |
| Female adult ratio | 0.703 | 0.742 | 0.615 | -0.097 | 0.225 |
| | (0.611) | (0.574) | (0.490) | (0.370) | (0.217) |
| Sex ratio at birth | 0.067 | 0.109 | 0.201 | -0.032 | -0.059 |
| | (0.156) | (0.173) | (0.162) | (0.099) | (0.050) |
| Residents with college or higher | -0.249* | -0.208* | 0.048 | -0.191 | -0.065 |
| | (0.119) | (0.117) | (0.181) | (0.225) | (0.055) |
| Employment rate | 0.029 | 0.062 | -0.046 | 0.095 | 0.012 |
| | (0.074) | (0.069) | (0.055) | (0.088) | (0.023) |
| Younger residents in 20s and 30s | -0.439 | -0.249 | 0.428 | -0.815*** | 0.138 |
| | (0.311) | (0.301) | (0.294) | (0.312) | (0.113) |
| Older residents aged 60 or older | -0.581** | -0.509*** | 0.091 | -0.665** | 0.064 |
| | (0.202) | (0.184) | (0.180) | (0.268) | (0.042) |
| First-stage test statistics | – | 79.376 | 79.376 | 79.376 | 79.376 |
| Observations | 469 | 467 | 467 | 467 | 467 |
| *R*-squared | 0.249 | 0.058 | -0.024 | 0.102 | 0.052 |

*Note*: The dependent variable is female candidates' vote share in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

## Appendix C. Full Results of Table 7

Table 7A. Impacts on the Ratio of Female Candidates' Winning Seats in the 5th Election: All Districts

| | Dependent Variable: Female Elected Ratio in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| Female elected in the 4th election | 0.124*** | 0.020 | 0.044 | -0.014 | -0.010** |
| | (0.028) | (0.072) | (0.075) | (0.026) | (0.004) |
| Female candidate ratio in the 4th election | 0.168** | 0.363** | 0.168* | 0.165** | 0.031* |
| | (0.071) | (0.147) | (0.099) | (0.075) | (0.018) |
| Log of voters | 0.062*** | 0.062*** | 0.048*** | 0.011* | 0.003 |
| | (0.016) | (0.015) | (0.012) | (0.006) | (0.003) |
| Female adult ratio | 1.160** | 1.191** | 1.300*** | -0.100 | -0.008 |
| | (0.517) | (0.481) | (0.476) | (0.247) | (0.132) |
| Sex ratio at birth | -0.035 | -0.012 | -0.068 | 0.027 | 0.028 |
| | (0.104) | (0.089) | (0.087) | (0.051) | (0.026) |
| Residents with college or higher | -0.289* | -0.322** | -0.257* | -0.044 | -0.021 |
| | (0.136) | (0.137) | (0.147) | (0.098) | (0.032) |
| Employment rate | 0.023 | 0.050 | 0.015 | 0.037 | -0.002 |
| | (0.078) | (0.075) | (0.065) | (0.063) | (0.016) |
| Younger residents in 20s and 30s | -0.121 | -0.021 | 0.020 | -0.025 | -0.016 |
| | (0.332) | (0.292) | (0.220) | (0.178) | (0.045) |
| Older residents aged 60 or older | -0.329* | -0.299* | -0.211 | -0.093 | 0.006 |
| | (0.175) | (0.169) | (0.162) | (0.143) | (0.037) |
| First-stage test statistics | – | 168.017 | 168.017 | 168.017 | 168.017 |
| Observations | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| *R*-squared | 0.186 | 0.086 | 0.062 | 0.025 | -0.014 |

*Note*: The dependent variable is the proportion of female elected members in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 7B. Impacts on the Ratio of Female Candidates' Winning Seats in the 5th Election: Competitive Districts

| | Dependent Variable: Female Elected Ratio in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| Female elected in the 4th election | 0.156*** | 0.108* | 0.113 | 0.003 | -0.008* |
| | (0.035) | (0.058) | (0.075) | (0.030) | (0.005) |
| Female candidate ratio in the 4th election | 0.131*** | 0.221* | 0.124 | 0.073 | 0.023 |
| | (0.032) | (0.128) | (0.092) | (0.051) | (0.018) |
| Log of voters | 0.073*** | 0.074*** | 0.051*** | 0.019** | 0.005 |
| | (0.024) | (0.023) | (0.019) | (0.008) | (0.006) |
| Female adult ratio | 0.967 | 0.983 | 1.477* | -0.260 | -0.233 |
| | (0.794) | (0.751) | (0.874) | (0.574) | (0.225) |
| Sex ratio at birth | 0.063 | 0.080 | -0.111 | 0.122 | 0.068 |
| | (0.187) | (0.167) | (0.204) | (0.099) | (0.052) |
| Residents with college or higher | -0.288 | -0.305* | -0.303* | -0.018 | 0.016 |
| | (0.192) | (0.176) | (0.177) | (0.082) | (0.045) |
| Employment rate | 0.085 | 0.100 | 0.068 | 0.071 | -0.038* |
| | (0.141) | (0.134) | (0.147) | (0.049) | (0.021) |
| Younger residents in 20s and 30s | 0.111 | 0.163 | -0.074 | 0.250*** | -0.013 |
| | (0.456) | (0.364) | (0.278) | (0.075) | (0.086) |
| Older residents aged 60 or older | -0.141 | -0.110 | -0.393* | 0.204** | 0.079** |
| | (0.259) | (0.225) | (0.229) | (0.097) | (0.039) |
| First-stage test statistics | – | 104.901 | 104.901 | 104.901 | 104.901 |
| Observations | 564 | 564 | 564 | 564 | 564 |
| *R*-squared | 0.164 | 0.107 | 0.075 | 0.050 | -0.007 |

*Note*: The dependent variable is the proportion of female elected members in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 7C. Impacts on the Ratio of Female Candidates' Winning Seats in the 5th Election: Non-competitive Districts

| | Dependent Variable: Female Elected Ratio in the 5th Election (2010) | | | | |
|---|---|---|---|---|---|
| | All | | Major | Minor | Independent |
| | OLS | IV | IV | IV | IV |
| Variables | (1) | (2) | (3) | (4) | (5) |
| Female elected in the 4th election | 0.063 | -0.174** | -0.132** | -0.028 | -0.014* |
| | (0.042) | (0.087) | (0.053) | (0.054) | (0.008) |
| Female candidate ratio in the 4th election | 0.227 | 0.663** | 0.327** | 0.298* | 0.039 |
| | (0.187) | (0.288) | (0.158) | (0.168) | (0.037) |
| Log of voters | 0.043* | 0.039** | 0.022* | 0.014 | 0.003 |
| | (0.021) | (0.019) | (0.012) | (0.012) | (0.004) |
| Female adult ratio | 1.136 | 1.348* | 0.896 | 0.163 | 0.289* |
| | (0.765) | (0.689) | (0.646) | (0.199) | (0.159) |
| Sex ratio at birth | -0.179 | -0.145 | -0.139* | -0.012 | 0.007 |
| | (0.105) | (0.090) | (0.079) | (0.056) | (0.017) |
| Residents with college or higher | -0.090 | -0.128 | 0.181 | -0.258 | -0.052 |
| | (0.223) | (0.231) | (0.199) | (0.337) | (0.107) |
| Employment rate | -0.041 | 0.016 | -0.073** | 0.060 | 0.029* |
| | (0.075) | (0.095) | (0.036) | (0.087) | (0.015) |
| Younger residents in 20s and 30s | -0.659* | -0.461 | 0.164 | -0.592 | -0.033 |
| | (0.308) | (0.384) | (0.215) | (0.363) | (0.097) |
| Older residents aged 60 or older | -0.554*** | -0.537** | 0.084 | -0.557* | -0.064 |
| | (0.160) | (0.255) | (0.173) | (0.293) | (0.041) |
| First-stage test statistics | − | 57.974 | 57.974 | 57.974 | 57.974 |
| Observations | 469 | 467 | 467 | 467 | 467 |
| *R*-squared | 0.200 | -0.011 | -0.055 | 0.083 | -0.008 |

*Note*: The dependent variable is the proportion of female elected members in the 5th election, but each column includes all or part of female candidates for computation. Particularly, columns (1) and (2) include all female candidates; column (3) contains those nominated by major parties; column (4) comprises those nominated by minor parties a party; and column (5) takes in independent candidates only. Column (1) presents OLS results, while the other columns (2)-(5) provide IV estimates. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.

## Appendix D. Full Results of Table 8

| | Dependent Variable: In the 5th Election (2010) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Female Ratio | Female Vote Share | Female Elected | Female Ratio | Female Vote Share | Female Elected | Female Ratio | Female Vote Share | Female Elected |
| | All Districts | | | Competitive Districts | | | Non-competitive Districts | | |
| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Female elected in the 4th election | 0.115** | 0.123** | 0.017 | 0.158*** | 0.194*** | 0.103* | 0.023 | -0.067 | -0.173** |
| | (0.056) | (0.059) | (0.072) | (0.051) | (0.048) | (0.058) | (0.089) | (0.104) | (0.088) |
| Female candidates at National Assembly | 0.149* | 0.204** | 0.369** | 0.101 | 0.147 | 0.229* | 0.250* | 0.390* | 0.662** |
| | (0.086) | (0.102) | (0.146) | (0.085) | (0.109) | (0.120) | (0.151) | (0.229) | (0.290) |
| Females elected for National Assembly | 0.024*** | 0.020** | 0.015 | 0.030*** | 0.033*** | 0.030* | 0.015 | 0.005 | -0.001 |
| | (0.005) | (0.009) | (0.013) | (0.005) | (0.009) | (0.017) | (0.009) | (0.012) | (0.016) |
| Female candidate ratio in the 4th election | 0.013 | 0.014 | -0.011 | 0.013 | 0.014 | -0.015 | 0.024 | -0.002 | -0.003 |
| | (0.014) | (0.015) | (0.016) | (0.015) | (0.014) | (0.015) | (0.016) | (0.034) | (0.027) |
| Log of voters | 0.049*** | 0.061*** | 0.062*** | 0.060*** | 0.075*** | 0.075*** | 0.037*** | 0.036 | 0.039** |
| | (0.009) | (0.015) | (0.015) | (0.012) | (0.019) | (0.023) | (0.011) | (0.023) | (0.019) |
| Female population proportion | 0.296 | 0.879*** | 1.197** | -0.041 | 0.884** | 1.145 | 0.426 | 0.713 | 1.352* |
| | (0.389) | (0.272) | (0.481) | (0.601) | (0.384) | (0.748) | (0.442) | (0.564) | (0.700) |
| Sex ratio at birth | -0.038 | 0.096 | -0.018 | -0.052 | 0.090 | 0.090 | -0.064 | 0.104 | -0.144* |
| | (0.055) | (0.116) | (0.091) | (0.073) | (0.191) | (0.178) | (0.088) | (0.175) | (0.086) |
| College educated population | -0.058 | -0.123* | -0.337** | -0.004 | -0.120** | -0.357** | -0.081 | -0.206* | -0.130 |
| | (0.130) | (0.066) | (0.131) | (0.159) | (0.060) | (0.162) | (0.081) | (0.115) | (0.234) |
| Employed population | 0.095*** | 0.065 | 0.062 | 0.118*** | 0.098 | 0.146 | 0.071 | 0.063 | 0.016 |
| | (0.036) | (0.052) | (0.075) | (0.041) | (0.071) | (0.132) | (0.049) | (0.072) | (0.092) |
| College educated female | 0.311* | 0.076 | -0.029 | 0.293 | 0.057 | 0.173 | 0.127 | -0.266 | -0.461 |
| | (0.188) | (0.243) | (0.308) | (0.320) | (0.347) | (0.401) | (0.294) | (0.317) | (0.389) |
| Employed female | 0.045 | -0.151 | -0.307* | 0.086 | -0.089 | -0.116 | -0.109 | -0.511*** | -0.538** |
| | (0.081) | (0.149) | (0.165) | (0.191) | (0.218) | (0.223) | (0.145) | (0.184) | (0.259) |
| First-stage test statistics | 157.433 | 191.186 | 168.651 | 95.783 | 106.29 | 104.56 | 55.072 | 76.292 | 56.754 |
| Observations | 1,033 | 1,033 | 1,033 | 564 | 564 | 564 | 467 | 467 | 467 |
| *R*-squared | 0.170 | 0.146 | 0.086 | 0.176 | 0.162 | 0.110 | 0.142 | 0.057 | -0.010 |

*Note*: For the dependent variable, columns (1), (4), and (7) exploit the proportion of female candidates in the 5th election; columns (2), (5), and (8) use the vote share of female candidates in the 5th election; and columns (3), (6), and (9) adopt the proportion of female elected members in the 5th election. Columns (1)-(3) cover all districts; columns (4)-(6) focus on competitive districts; and columns (7)-(9) concentrate on non-competitive districts. All columns provide IV estimates. Robust standard errors are presented in parentheses. *** significant at the 1% level; ** at the 5% level; * at the 10% level.