What Happens When a Woman Wins an Election? Evidence from Close Races in Brazil*

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This Version, March 2016

Abstract

We analyze close elections between male and female mayoral candidates in Brazilian municipalities to provide novel evidence on the role of women as policymakers. Using an objective measure of corruption based on random government audits, we find that female mayors are less likely to engage in corruption compared to male mayors. We also find that female mayors hire fewer temporary public employees than male mayors during the electoral year and tend to attract less campaign contributions when running for reelection. Moreover, our results show that female mayors have a lower reelection probability than male mayors. We interpret our findings as suggesting that male incumbents are more likely to engage in strategic behaviour and this improves their electoral performance. Other explanations receive less support from the data.

Keywords: gender, politics, corruption, patronage, campaign contributions.

JEL Classification: J16, H41, P16, D72, I00, I18

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1 Introduction

In this paper, we provide new evidence on the role of women as policymakers. In particular, we focus on close elections between male and female mayoral candidates in Brazilian municipalities to analyze whether the gender of the policymaker affects corruption.

In recent years, a great deal of attention in economics has focused on understanding the role of women as policymakers. Several empirical studies find evidence consistent with the hypothesis that the gender of the policymaker affects policy decisions and outcomes (see, among many others, Edlund and Pande, 2001; Chattopadhyay and Duflo, 2004; Schwindt-Bayer, 2006; Pino, 2011). Several experimental studies suggest that the choices women make once in power may be more socially oriented than those of men (Eckel and Grossman, 2000; Andreoni and Vesterlund, 2001; Song, Cadsby and Morris, 2004). Consistent with this experimental evidence, female representation in political leadership positions is associated with less corruption and bribe-taking, as measured using survey data (Swamy et al., 2001; Dollar et al., 2001; Beaman et al., 2009).

We contribute to this literature by providing novel evidence on the causal effect of the gender of the policymaker on corruption in the municipal administration using an regression discontinuity (RD) design. Instead of relying on survey measures of corruption, we use an objective measure of irregularities in government contracts and purchases based on random audits of local administrations. We find that female mayors are less likely to be involved in administrative irregularities. We also analyze gender differences along two other dimensions that may also be related to corrupt practices at the local level, which have not been explored before in the gender literature.[1] First, we analyze employment in the municipal administration, which can provide some insights about the use of patronage. We find that male mayors tend to hire more temporary public employees during the electoral year, which is a standard way to engage in patronage in Latin America (Kemahlioglu, 2013). Second, we analyze gen-

[1] The term corruption is typically used to refer to a broad range of activities, beyond bribe-taking. Several definitions of corruption exit in the literature. According to a widely-cited definition by Nye (1967) corruption can be defined as "behaviour which deviates from the formal duties of a public role because of private-regarding (personal, close family, private clique) pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding influence." World Bank (1997) defines corruption as the abuse of public office for private gain. Public office can be abused for private gain not only by taking bribes, but also through patronage and nepotism, the theft of state assets, the diversion of state revenues, and by using public resources to advance the causes of private (special interest) groups.

der differences in terms of campaign contributions. Political donations may allow private interests to gain influence over elected officials (Strauss, 1999; Ansolabehere, 2007) and the empirical evidence from Brazil shows that firms that contribute to the campaigns of winning candidates experience significant increases in government contracts (Boas et al., 2014). We find that women receive fewer campaign contributions than men, potentially consistent with our corruption results.

In addition, we also analzye reelection outcomes. We find that female mayors are less likely to be reelected compared to their male counterparts. We interpret our findings as showing that, despite being more corrupt, male mayors are more likely to be reelected due to their involvement in patronage and their ability to attract more campaign donations. We provide evidence that is inconsistent with some of the alternative explanations.

The main goal of the paper is to provide novel rigorous evidence about how the gender of the policymaker affects corruption. We rely on an objective measure of irregularities in government contracts and purchases, which comes from administrative data from a federal anti-corruption program in Brazil. Starting in 2003, the federal government began to randomly audit municipalities to detect administrative irregularities in government contracts and purchases. To the best of our knowledge, ours is the first paper that links the gender of the policymaker to objective data on irregularities in government contracts and purchases, instead of relying on survey measures as the extant literature. We find that the probability of observing a corruption episode is between 29 and 35 percent lower in municipalities with female mayors than in those with male mayors.

To analyze patronage, we focus on temporary employment in the local public administration. According to research in political science, this is the standard tool through which mayors engage in political patronage to gain reelection (Ames, 1995; Weyland, 1996; Engerman and Sokoloff, 2002; Mainwaring, 2002). Weingrod (1968) defines patronage as "the way in which party politicians distribute public jobs or special favors in exchange for electoral support." Our measure of temporary employment includes all non-permanent employees working in the municipal administration, including commissioned positions (*cargos comissionados*), which are positions directly appointed by the mayor without clear predefined criteria or requirements. We find that male mayors hire more temporary employees to work in the municipal administration than female mayors (both in absolute terms and as a fraction of total employees). These temporary hires are concentrated in the electoral year, consistent with the idea that male mayors may increase temporary employment close to the elections to improve their electoral chances (Kemahlioglu, 2013). Permanent employees have to pass a civil service entrance exam and cannot be easily dismissed by the mayor, as they have de jure job stability. Given these restrictions, it is harder for mayors to use permanent employment as a tool for patronage. Robinson and Verdier (2013) argue that political commitment problems explain why patronage takes the form of employment in the public sector. A key issue in this regard is that jobs must be reversible (e.g., the politician should be able to replace workers), so that they tie the continuation utility of a voter to the political success of a particular politician. Consistent with this, we find no gender differences in terms of permanent public employees in the municipal administration.

We also analyze campaign contributions, as political donations are considered to be one of the main ways through which private interests gain influence over elected officials. The main objective of campaign finance regulations is in fact to prevent political corruption (Strauss, 1999; Ansolabehere, 2007).[2] Several papers suggest that in Brazil, political campaign financing is a crucial mechanism through which firms establish political connections. Corporations can make cash donations to candidates or party campaign funds, with a maximum of two percent of their previous year's gross revenues, although off-the-books contributions are also quite common.[3] Empirical studies have found a significant relation between corporate campaign donations and firm profitability, access to financing, and the probability of receiving government procurement contracts (Bandeira-de-Mello and Marcon, 2005; Claessens et al., 2008; and Boas et al., 2014). We find that female mayors that run for reelection receive fewer campaign contributions than male mayors running for reelection.[4] This may be consistent with our corruption results, to the extent that male mayors may be more likely to manipulate government procurement processes to favor firms that donated to their campaigns.

When analyzing electoral outcomes, we find that female mayors who are eligible to re-run have about 20 percentage points lower probability of being reelected compared to their male

[2]In McConnell v. Federal Election Commission (2003) the U.S. Supreme Court considered the undue access to officeholders by campaign donors to be a form of corruption.

[3]In 2015 the Brazilian Supreme Court banned corporate campaign contributions, amid a corruption scandal (The Wall Street Journal, 2015).

[4]We can only observe campaign donations for those mayors that choose to run for reelection. As mentioned below, we find no gender difference in the probability of re-running.

counterparts.[5] We also find that there is no gender difference in the probability of re-running. Overall, we interpret our findings as showing that, despite being more corrupt, male mayors are more likely to be reelected due to their involvement in patronage and their ability to attract more campaign donations.

Providing conclusive evidence on the link between patronage, campaign donations, and reelection strategies is tricky, because the gender of the policymaker may affect many policies, some of which are potentially unobservable.[6] To provide more evidence in line with this interpretation, we consider and rule out alternative explanations. One potential alternative explanation for our reelection finding is that, despite being more corrupt, male mayors may be doing better than female mayors in some policies or may provide more public goods, and this explains their higher reelection probability. However, the great majority of evidence from other countries supports the view that female politicians do a better job than male politicians in providing public goods.[7] Whether similar results hold in the Brazilian context is an empirical question.

To analyze this alternative mechanism, we study differences across genders in the ability to attract intergovernmental transfers and in the provision of key public goods that depend on the municipal administration: health and education. First, we look at total discretionary transfers for capital investment. In Brazil, the effort of the mayor is one of the main determinants of the amount of these transfers. Second, we analyze health outcomes, focusing in particular on health care services related to prenatal care delivery.[8] We focus on prenatal

[5] One concern when studying reelection is that the decision to re-run may be endogenous. To overcome this concern, we define our reelection measure considering all non-term limited mayors, who are therefore eligible for reelection, irrespective of whether they actually re-run or not.

[6] In unreported tests, we analyzed the relation between patronage (proxied, alternatively, by the number and the fraction of temporary employees working in the public administration in the election year) and the probability of reelection, and found a positive and statistically significant correlation. We also found that incumbent mayors that receive more campaign contributions (as a fraction of total campaign contributions in a given mayoral race) have a higher probability of reelection.

[7] For instance, Anzia and Berry (2011) show that female members of the U.S. Congress secure more funds from federal and state discretionary programs for their districts. Bhalotra and Clots-Figueras (2014) show that in places ruled by female politicians prenatal care is better and infant mortality is lower. Clots-Figueras (2012) analyzes Indian data and shows that higher female political representation increases the probability that a citizen will attain primary education in urban areas (but not in rural areas). Casaburi and Troiano (2015) find that Italian female mayors are less likely to crack down on tax evasion compared to their male counterparts.

[8] The public health system in Brazil is decentralized, spending is mostly financed by the federal government, but municipalities are responsible for all decisions regarding resource allocation. Thus, municipal policies are a relevant determinant of health outcomes.

care outcomes because, to the best of our knowledge, these are the only health outcomes readily available at the municipal level and the evidence suggests that they tend to respond quickly to changes in policies (Fujiwara, 2015). Additionally, we focus on educational inputs for which data at the local level are readily available: the fraction of schools in a municipality that have certain facilities (library, science lab, and internet). Our results show that, if anything, women do a better job at attracting transfers and providing public goods. First, we find that female mayors attract about 60 percent more transfers for capital investment than their male counterparts. Second, our results show that having a female mayor seems to lead to better health outcomes related to prenatal care delivery. Third, female mayors seem more likely to head municipalities with better educational facilities, although the differences are small and statistically insignificant. This suggests that gender differences in the quality and quantity of public goods are unlikely to offer an alternative explanation to why men are more likely to be reelected.

Another potential alternative explanation for our findings is that men and women face different electoral opponents when they run for reelection. This may happen, for instance, if, after a mixed gender close election, the electoral strength of the incumbent is perceived to be gender dependent. For instance, female incumbents may be considered weaker, and thus they may attract more opponents or different opponents. We look at whether the number and education of opponents to female incumbents differ from those of the opponents of male incumbents. Our results are inconsistent with the importance of such a channel.

A key empirical challenge to identify the effect of the gender of the mayor on policy outcomes is that there may be municipality-specific factors that are correlated with both the gender of the mayor and policy outcomes. To control for municipality-specific confounding factors, we adopt a Regression Discontinuity Design (RDD) in mixed gender close electoral races. In this set-up, identification comes from comparing municipalities where a female candidate barely won an election against a male candidate with municipalities where the opposite occurred.[9] Although this estimation strategy controls for municipality unobservable

[9] Several recent papers argue that the assumptions of RDD may be violated in recent U.S. House of Representatives elections (Snyder, 2005; Caughey and Sekhon, 2011; and Grimmer et al., 2012). However, Eggers et al. (2013) analyze elections around the world and find no other example of elections that violate the RDD assumptions. The richness of our dataset allows us to show that a wide array of pre-determined covariates are similar between municipalities where a female candidate barely won an election against a male candidate and municipalities where the opposite occurred, supporting the validity of our research design in

factors, it does not account for individual characteristics of the mayor. This could raise some concerns if male and female mayors differ in terms of individual characteristics that are relevant for policymaking.[10] To alleviate this concern, common in the gender literature, we show that female and male mayors elected following close races are similar in terms of a wide range of observable characteristics, including education, political affiliation, and political experience.

There is a large literature, summarized in Duflo (2012) and Doepke, Tertilt and Voena (2012), studying gender and politics. We contribute to this literature by studying whether the gender of the policymaker affects corruption. As mentioned above, several papers have used survey data to look at the relationship between gender and corruption. Swamy et al. (2001) find that women are less likely to pay bribes and to condone bribery. Dollar et al. (2001) show that corruption is less severe in countries where women constitute a majority of parliamentary seats, senior positions in the government bureaucracy, and the labor force. Beaman et al. (2009) find that in villages with gender quotas villagers report paying less bribes. However, all these papers rely on survey-based measures of corruption, which typically lead to biased estimates (Kraay and Murrell, 2015). We address this limitation of the literature by using an objective measure of corruption based on random audits of municipal governments. Also, while most of the evidence documents a correlation between gender and corruption, we identify the causal effect of the gender of the policymaker on corruption by using an RD design. To the best of our knowledge, we are the first to provide evidence on gender differences in political patronage and campaign contributions. Moreover, we present novel evidence on gender differences in reelection outcomes in developing countries. Ferreira and Gyourko (2014) study the relationship between the gender of the policymaker and reelection outcomes for mayors in the U.S. In contrast to our findings, they find that female mayors are more likely to be reelected and they don't find differences in the observable policies that male and female politicians implement.

the Brazilian setting.

[10] One plausible concern in our setting is that women that select into a close election against a man may be of better quality than the male politicians who end up in a close election against a woman. First, although the average quality of a politician is an unobserved variable, we find that the average candidates' education, a variable that is plausibly correlated with quality (Besley, Montalvo and Reynal-Querol, 2011), is balanced in close mixed gender election. Second, even if some unobservable quality measures were unbalanced, if the argument above holds, then female mayors should be *more*, and not less, likely to be reelected if voters value positively politician's quality and punish bad administrators (Ferraz and Finan, 2008).

The paper proceeds as follows. Section 2 describes the Brazilian institutional framework and our data sources. Section 3 lays out our identification and estimation strategy. Section 4 discusses the empirical results and validity tests. Section 5 concludes.

2 Institutions and Data

Our analysis focuses on municipal administrations in Brazil. Brazilian municipalities are minor federative units with an autonomous local government, ruled by a mayor, directly elected by citizens to a four-year mandate, and a legislative body, also directly elected by voters. Mayors of municipalities above 200,000 voters are directly elected by a majority runoff rule, while mayors of municipalities below 200,000 voters are directly elected with plurality rule.[11] Before 1998 mayors could not run for reelection, but since 1998, they are allowed to run for a second term. In our study we focus on two municipal administration mandates in municipalities below 200,000 voters: 2001-2004 and 2005-2008. Electoral data come from *Tribunal Superior Eleitoral* (Superior Electoral Court), which is the highest judicial body of the Brazilian Electoral Justice. Data on mayoral characteristics, including gender, education, political affiliation, and political experience also come from Tribunal Superior Eleitoral. For our analyses, we focus on races with two candidates where one candidate is a woman and the other is a man, which gives us a sample of 723 races.

Data on corruption come from random audits of municipal governments. Since 2003, as part of a major anti-corruption program launched by the Brazilian federal government, municipalities have been randomly chosen through a lottery to be audited. Auditors are sent to the selected municipalities to examine the local use of federal transfers. For each municipality, the auditors collect documents and information starting in 2001 and prepare an audit report. To date, over 1,600 municipalities have been audited.

The corruption data from audit reports are coded by Brollo et al. (2013).[12] The main categories of irregularities described in the audit reports are: 1) *illegal procurement practices*, which occur when one of the following is reported: a) competition has been limited, b) bid value has been manipulated, c) an irregular firm wins the bid process, d) the minimum number

[11]See Fujiwara (2011) for an analysis of the effects of this electoral rule in Brazilian municipalities.

[12]Similar measures of corruption are used by Ferraz and Finan (2008), Brollo (2011) and Ferraz and Finan (2011)

of bids is not attained, or e) the required procurement procedure is not executed; 2) *fraud*; 3) *over-invoicing*, occurring when there is evidence that public goods or services are purchased for a value above the market price; and 4) *diversion of funds*. Following the literature (see, for instance, Brollo et al., 2013) we measure corruption using a dummy variable that indicates whether at least one episode of any of the types of irregularities described above is detected by auditors. We extend the data of Brollo et al. (2013) and include data from the first thirty-three lotteries, which were conducted between May 2003 and July 2010. Corruption data are available for 161 races in our sample.

Data on the number of public employees in the municipal administration come from the survey *Perfil dos Municipios Brasileiros* (Brazilian Municipalities Profile) conducted by the national statistics office IBGE (*Instituto Brasileiro de Geografia e Estatística*, Brazilian Geographic and Statistics Institute). Detailed data on municipal employment are only available for 2005 and 2008, thus we only have data for the first and last year of the mayoral term 2005-2008. We distinguish between permanent and temporary employees of the municipal administration. Permanent employees have to pass the civil service exams and have de jure job stability. Temporary employees include all non-permanent employees working in the municipal administration, including commissioned positions (*cargos comissionados*), which are positions directly appointed by the mayor without clear predefined criteria or requirements. Data are not available before 2005, so we cannot verify that our treatment and control group have similar fractions of temporary public employees before the start of the 2005-2008 mayoral term.[13]

Data on campaign contributions come from Tribunal Superior Eleitoral. Candidates are required to disclose all donors to the electoral authorities, who then release data on election finances for each candidate. For each mayor in our sample that runs for reelection, we consider the total campaign contributions received.

As mentioned above, we also analyze differences across genders in the ability to attract intergovernmental transfers and in the provision of key public goods that depend on the municipal administration: health and education. Most Brazilian municipalities rely on state and federal transfers as their main revenue sources, with federal transfers accounting on average

[13]To alleviate the concerns arising from this limitation, we verified that many pre-determined covariates are balanced across treatment and control group, as discussed below.

for 65 percent of the municipal budget. We focus on total discretionary transfers for capital investments (*CONVENIO* agreements) from federal and state governments. These transfers account about 40 percent of total municipal capital investment in all sectors, with the bulk being accounted for by transfers from the federal government.[14] Mayors have a significant effect on the allocation of these transfers, as the local administration has to apply for them.[15] Data on transfers for capital investment are self-reported by municipal administrations and are obtained from the Brazilian National Treasury Website (*Tesouro Nacional*) –*FINBRA* dataset.[16]

One of the most important characteristics of the public health system in Brazil is decentralization. Spending is mostly financed by the federal government, but municipalities are responsible for all decisions regarding resource allocation (Collins et al., 2000). To analyze health outcomes, we use data from the Information System on Live Births (SINASC). This system is managed by the Secretariat of Health Surveillance, in conjunction with state and municipal health departments. Each state health department collects data on live birth certificates in healthcare facilities and on the registries (for home births) and inputs all the information into the SINASC. The Ministry of Health then assembles the data. This dataset contains monthly information on number of prenatal medical visits and on period of pregnancy (weeks). The variables we use for our analysis are the share of pregnant women that received at least one prenatal medical visit and the fraction of births that are considered as non premature (at least 37 weeks).

Local governments are one of the main providers of primary education in Brazil (Souza, 2003). Brazilian states and municipalities are mandated by the Constitution to spend at

[14]In unreported robustness tests, we analyzed state and federal discretionary transfers for capital investments separately and found that the differences we find between female and male mayors are driven by federal transfers.

[15]Discretionary transfers require an agreement between the municipal administration and the state or federal government. Most transfers must be incorporated into the budget law by the (national or state) legislature through budgetary amendments; therefore, support from deputies is very important. If the budgetary amendments receive legislative approval, then the executive power (i.e., the president or state governor) can decide whether to execute them (i.e., send the money to the municipality) or not.

[16]The variable used in the first part of the analysis is the log of total amount of the per capita transfers for capital investment. We choose the log specification given the skewness of the transfers received by the municipalities. Municipalities that do not receive transfers for capital investment are not dropped when we run the log specification. For the log transformation we considered a reported amount of R$ 1,00, then, the log amount is zero. All budget variables are in real terms at 2006 prices. Alternatively, we estimated a Poisson regression considering as an outcome per capita transfers, and obtained similar results.

least 25 percent of their total revenues (including federal transfers) on education. To analyze education outcomes, we use annual data for the period 2001-2008 from the school census (*Censo Escolar*) conducted by the Ministry of Education. Our education outcomes at the municipality level are related to the physical infrastructure used for education, as this is the only information available at the local level for all of our sample period. Specifically, we analyze the share of schools in a municipality with internet, science labs, and libraries.

3 Empirical Strategy

3.1 Identification: Regression Discontinuity

Identifying the effects of the gender of the policymaker on policy outcomes is a daunting task.[17] A comparison between municipalities with a female mayor and those with a male mayor will probably generate biased estimates due to endogeneity issues. For instance, policy decisions might be correlated with municipality-specific characteristics such as attitudes towards women or demographic characteristics, all of which could also influence the gender of the local mayor. Define $\tau_{i,t}(1)$ as the potential outcome of municipality i if the mayor is a woman, and $\tau_{i,t}(0)$ as the potential outcome of the same municipality if the mayor is a man, in a specific time period t.[18] We are interested in estimating the difference in *potential* outcome in mixed-gender race, i.e. $E(\tau_{i,t}(1) - \tau_{i,t}(0)|i \in \Omega)$. The problem of causal inference is that, at a given point in time, we cannot observe both potential outcomes. That is, it is impossible to know the policies a city that has a female mayor would have adopted with a male mayor. The intuition of our identification strategy is that cities in which a woman won against a man by a narrow margin can be a good counterfactual for those places in which the opposite occurred (a man won against a woman by a narrow margin). [19] In this setting, the identification comes from the assumption that in close races random factors are crucial

[17]From a theoretical perspective, the median voter model would predict no differences in the decisions that male and female politicians take. However, many other models may predict gender differences. For example, theoretical models in which male and female politicians have different preferences (Alesina, 1988) and are unable to commit to a specific policy during the electoral campaign would be consistent with gender differences in policies.

[18]In our equations, t is year or term depending on the specification.

[19]See Lee, Moretti, and Butler (2004), Rehavi (2007), Lee (2008), Pettersson-Lidbom (2008), Pino (2011), Brollo and Nannicini (2012), Gagliarducci and Paserman (2012) and Vogl (2014) for other examples of RDD in close elections.

to decide elections. Therefore, the probability of winning is the same for both female and male candidates.

The variable F_{it} defines the treatment status: $F_{it} = 1$ if the mayor is a woman, and $F_{it} = 0$ otherwise. The observed outcome is thus: $\tau_{it} = F_{it} \cdot \tau_{it}(1) + (1 - F_{it}) \cdot \tau_{it}(0)$. The estimand of interest is the ATE, $E[\tau_{it}(1) - \tau_{it}(0)]$, defined over some sub-population of interest.

Specifically, we define the *treatment group* as the municipalities that have a mayor who is a woman elected in a mixed-gender race. Assignment to treatment can be formalized as:

$$Female_{it} = 1[MV_{it} \geq 0] \tag{1}$$

where MV_{it} is the female candidate margin of victory in municipality i during term t and $1[.]$ the indicator function. MV_{it} is specified as the vote share of the female candidate *minus* the vote share of the male candidate. Therefore, it will take positive values if the mixed-gender electoral race resulted in a female mayor, and negative if it resulted in a male mayor. At the zero threshold, $MV_{it} = 0$, the gender of the mayor F_{it} sharply changes from zero to one. MV_{it} can be seen as a random variable depending on observable and unobservable variables, as well as on random events on election day. The standard RDD assumption is that potential outcomes must be a continuous function of the running variable at the threshold (Hahn, Todd, and Van der Klaauw, 2001). We indirectly test this assumption in section 4.4.[20]

The ATE in close elections is thus:

$$\gamma \equiv E[\tau_{it}(1) - \tau_{it}(0)|MV_{it} = 0] = \lim_{MV_{it} \downarrow 0} Y_{it} - \lim_{MV_{it} \uparrow 0} Y_{it} \tag{2}$$

γ is defined as a local effect, because it captures the impact of the gender of the mayor on the outcome only for municipalities around the threshold $MV = 0$ (i.e. for the elections that were decided for a margin that is small enough).

3.2 Estimation

We first analyze whether gender is correlated with our outcomes by estimating the following OLS equations:

$$\tau_{it} = \rho_0 + \rho_1 F_{it} + \mu_t + \eta_{it} \tag{3}$$

[20] These assumptions refer to the *potential* outcomes. The actual outcome will be only one, and if gender plays a role in affecting outcomes it will also be discontinuous at $MV = 0$.

where τ_{it} is the outcome of interest in municipality i in time period t, F_{it} is a dummy that is one when the mayor of the municipality is female, μ_t are year fixed effects and standard errors are clustered at the municipality level because the same city may be observed in different mayoral terms. We report the coefficient $\hat{\rho}_1$, which does not have a causal interpretation because the gender of the politician might be correlated with the error term.[21]

We use two different methods to estimate the ATE expressed in equation (2). First, we fit a p-order polynomial in MV_{it} on either side of the threshold $MV_{it} = 0$:

$$\tau_{it} = \sum_{k=0}^{p}(\rho_k MV_{it}^k) + F_{it}\sum_{k=0}^{p}(\pi_k MV_{it}^k) + \mu_t + \eta_{it}, \tag{4}$$

where MV_{it} is the margin of victory in municipality i in time period t and standard errors are clustered at the municipality level. The estimated coefficient $\hat{\pi}_0$ identifies the ATE at the threshold $MV_{it} = 0$.[22]

We then follow Imbens and Lemieux (2008) and use a local linear regression approach, which restricts the sample to municipalities in the interval $MV_{it} \in [-h, +h]$ and estimates the model:

$$\tau_{it} = \rho_0 + \rho_1 MV_{it} + \pi_0 F_{it} + \pi_1 F_{it} \cdot MV_{it} + \mu_t + \eta_{it} \tag{5}$$

where the optimal bandwith h is computed using the algorithm by Calonico, Cattaneo and Titiunik (2014). Again, $\hat{\pi}_0$ identifies the ATE at the threshold $MV_{it} = 0$.

4 Results

4.1 Sample Selection and Descriptive Statistics

Brazil has 5,567 municipalities. For our analyses, we focus on those municipalities with mixed gender mayoral races in the municipal elections held in 2000 and 2004. To implement our identification strategy in the Brazilian multi-party system we further restrict our sample to

[21] This would happen, for instance, if municipalities that are more tolerant towards women are more likely to elect female mayors, and these places also adopt different policies.

[22] This estimation strategy allows us to keep the whole sample, but results might be sensitive to outcome values for observations far away from the threshold (see Imbens and Lemieux 2008). We follow the standard procedure of fitting a third order polynomial. We also computed our estimations with lower or higher order polynomials and found similar results.

races with two candidates where one candidate is a woman and the other is a man.[23] Races with only two candidates amount to 51 percent of the total. If we further restrict the sample to elections where we have two candidates of different gender, we end up with a sample of 723 races, representing 7 percent of all the races during our sample period.

Our outcomes are measured as the average across the years of each mayoral mandate and each municipality. So our data are at the municipality-mandate level, and our specifications always include mandate fixed effects and clustered standard errors at the municipality level.[24] In Table 1 we summarize our variables according to the gender of the mayor. The first panel of the table shows municipal characteristics, the second panel mayoral characteristics, and the third and last panel our outcome variables. Our two candidates mixed gender sample contains 723 races. However, due to data availability constraints, the number of observations we have for the different dependent variables can be smaller. For instance, we only have 161 observations for corruption in our sample, as we only observe corruption for those municipalities that were randomly audited by the federal government. Data on temporary employment in the public administration are available only for one of the mayoral mandates (2005-2008), which reduces the number of observations for this variable to 381. Finally, we only consider 254 observations for campaign contributions, as we observe this variable only for those mayors that run for reelection.

Our estimation strategy controls for municipality-specific characteristics. Therefore we should not expect any difference in municipal characteristics between treatment and control groups around the cut-off $MV_{it} = 0$. Our dataset allows us to test this for a vast array of observable municipal characteristics, including geographic location, income and population. These balance tests for municipal characteristics are reported in Table 2.[25] We find that all variables, including the gender wage gap at the municipality level, are balanced across the

[23]When including mixed gender races with more than two candidates we find evidence of non-random sorting around the cutoff. Most of the candidates in mixed gender elections with more than two candidates are male. This implies that any close election among more than two candidates is more likely to be won by a male candidate rather than by a female candidate. For example, a close election between two male candidates and one female candidate will result in a male mayor with probability= $\frac{2}{3}$ and in a female mayor with probability= $\frac{1}{3}$, if all candidates have the same probability of winning.

[24]We exclude an election-municipality observation if there are missing outcomes. For each outcome of interest we have checked that missing values are balanced around the threshold.

[25]We perform these balance tests by applying a polynomial approximation. We also did the same check by applying a local linear regression with optimal bandwidth and found similar results.

cut-off $MV_{it} = 0$.[26] Table 2 also reports the results of balance checks for several mayoral characteristics (party affiliation, education, experience) showing that there is no discontinuity around the cut-off. This is important as differences in mayoral characteristics could affect the interpretation of the results. For example, if men are more likely to face a binding term limit our estimates could potentially reflect the effect of this difference, and not gender differences per-se.

The results of these balance checks are corroborated by visual inspection. Figures 1, 2, 3, and 4 show scatterplots of the mean of municipal and mayoral characteristics. The variable on the x-axis is the margin of victory, and the observations are averaged within bins of 2 percent of margin of victory. We plot the average of each of these variables for municipalities in which women won (at the right of cut-off $MV_{it} = 0$) and for municipalities where men won (at the left of cut-off $MV_{it} = 0$). We find no discontinuities around the threshold for all variables.[27]

4.2 The Impact of Gender on Corruption, Campaign Contributions and Municipal Public Employment

Table 3 presents our main results. Panel A displays the results for corruption and campaign contributions and Panel B presents the results for employment in the local administration. For all of our outcomes, we report OLS results and two different specifications for the RDD estimates.[28]

The results for corruption are reported in columns 1, 2, and 3 of Panel A. As described above, in these regressions we use as dependent variable a dummy variable that equals one

[26] This variable is computed using micro data from the 2000 Brazilian demographic census. We estimate, for each Brazilian municipality, a regression of the log of the hourly wage on several observable characteristics (age, residence region, education, occupation, and race) and a female dummy. The coefficient on this dummy is our measure of the gender wage gap. Consistent with our findings, Eggers et al. (2013) analyze all mayoral races in Brazil between 2000 and 2008 and find no evidence of sorting around the threshold.

[27] We find convergence in close elections also for the observables that do not seem to be balanced for elections that are not close. For example, as can be seen in the graphs, female mayors are on average more educated and younger than their male counterparts. However, in close elections even these variables are similar and the jump is not statistically significant.

[28] We compute optimal bandwidth with the algorithm by Calonico, Cattaneo and Titiunik (2014). In addition, to alleviate the concerns arising from the RD functional forms, we repeated the analysis implementing a simple t-test of the means of all of our outcomes in closed intervals around the threshold $MV = 0$ (with intervals getting smaller and smaller) and in most cases found statistically significant differences between municipalities headed by women and men, as shown in the Appendix Table A7.

if the mayor is found to be involved in at least one irregularity classified as corruption. We can only estimate these regressions for those municipalities that were audited by the anti-corruption program. The results show that women are less likely to be involved in corruption episodes, on average. The size of the estimated coefficient is relatively similar for the two RDD specifications and implies that the probability of observing a corruption episode is around 29 to 35 percentage points lower in municipalities with female mayors than in municipalities with male mayors. Despite the small sample size, it is reassuring that corruption data are obtained from a random sampling procedure, given that the Brazilian Anti-Corruption Program randomizes the auditing process. Because of the random nature of the audits, we expect ex-ante that the probability of being audited does not depend on the gender of the mayor. [29]

We report the result for campaign contributions in columns 4, 5 and 6. We find that female mayors attract about 30-55 percent less campaign contributions than male mayors when running for reelection. This may be consistent with our corruption results, to the extent that male mayors may be more likely to manipulate government procurement processes to favor firms that donated to their campaigns. However, these results could also reflect that male mayors might have a higher intrinsic ability to attract campaign contributions or gender discrimination by donors.

We report the results for municipal public employment in columns 1 to 9 of Panel B. In particular, columns 1 to 3 present results using as dependent variable the (log of) the number of temporary employees in the municipal administration. Columns 4 to 6 show results for the (log of) the number of permanent employees. We display in columns 7 to 9 the results for the fraction of temporary public employees in the municipal administration. As described above, our measure of temporary employment includes all non-permanent employees working in the municipal administration, including commissioned positions (*cargos comissionados*), which are positions directly appointed by the mayor without clear predefined criteria or requirements. Permanent employees have to pass the civil service exams and have de jure job stability, so we don't expect this outcome variable to be sensitive to changes in the political environment of the municipality. We find that female mayors hire only around 52

[29] In unreported tests, we verify that the gender of the mayor is not correlated with the probability that a municipality is audited.

percent as many temporary employees as men. This means that male mayors hire about 64 additional temporary public employees. We do not find a statistically significant difference across gender for permanent public employees. Consistent with these results, we find that the share of temporary employees in the municipal administration is about 9 percentage points lower in municipalities with a female mayor.

If the differences between female and male mayors in terms of temporary employment in the municipal administration documented in Table 3 reflect the fact that male mayors increase temporary employment to improve their electoral chances, we wold expect to observe these differences in the last year of the mandate and not necessarily before then. To analyze this, Table 4 reports evidence about gender differences in the timing of temporary hires. The dependent variable for the regressions reported in Columns 1 to 3 is the fraction of temporary employees in the municipal administration during the first year of the mayoral mandate. The dependent variable for regressions reported in Columns 4 to 6 is the fraction of temporary employees in the municipal administration during the last year of the mayoral mandate (when elections are held).[30] We find that male mayors are more likely than women to increase temporary hires during the last year of the term, while the difference across genders is smaller and not statistically significant during the first year of the term. During the last year, female mayors hire about 10-13 percentage points less temporary employees as men. This means that male mayors hire about 80 additional temporary public employees in the electoral year compared to women, which on average represents almost 1.5 percent of the electorate (the average electorate size in our sample is around 6,000 voters). All in all, these results suggest that the temporary hires may be related to patronage considerations.

Overall, our results suggest that women are less likely to be involved in corruption and to engage in strategic behavior. This is broadly consistent with the experimental evidence, which suggests that the choices women make once in power may be more socially oriented than those of men.

Visual inspection of the outcomes in Figure 5 and 6 confirms the results described above, as there are visible discontinuities around the cut-off, although the graphical estimates look somewhat noisier than the statistical ones. However, it is re-assuring that a visible disconti-

[30] In unreported robustness tests, we don't find evidence that mayors change the other policies we study in the electoral year.

nuity appears even for our corruption variable, for which statistical tests may have less power because data are available only for a small subset of municipalities (those that were randomly audited by the program). In all these figures, the outcomes are averaged into bins of intervals of the margin of victory. Given that the density of the margin of victory is concentrated around zero, points closer to zero (close races) are both more relevant for our strategy and contain more information compared to those far from the zero margin of victory.[31]

4.3 The Impact of Gender on Reelection and Other Outcomes

Table 5 analyzes the effect of the gender of the mayor on the probability of reelection and on the probability of re-running. We define both the probability of reelection and the probability of re-running for all of the mayors that are not term limited. Therefore, the probability of reelection is identified unconditionally of whether the mayor chooses to run for reelection. According to the results reported columns 1 to 3, female mayors are around 20 percentage points less likely to be reelected than male mayors, out of a baseline mean for male mayors of 38 percent. The results reported in columns 4 to 6 show that the decision to run for reelection is not affected by the gender of the mayor.[32]

Overall, we interpret our findings as showing that, despite being more corrupt, male mayors are more likely to be reelected due to their involvement in patronage and their ability to attract more campaign donations. However, there may be other explanations. For instance, despite being more corrupt, male mayors may be doing better than female mayors in some policies or may provide more public goods. Another potential explanation is that female incumbents are perceived as having a different electoral strength than male mayors when running for reelection and therefore attract more or better opponents, which reduces their probability of reelection. The rest of the results in Tables 5 and those in Table 6 suggest these alternative explanations are unlikely to account for our findings.

In Panels B, C and D of Table 5 we report results analysing gender differences in polices.

[31] See Appendix Figures A1 and A2.

[32] Even if female mayors after a mixed gender close election are less likely to be reelected, this does not imply that female mayors that were elected during a close election are less likely to be in a second term. Our outcome "Probability of reelection" refers to the election subsequent to the mixed gender close election. This means that the margin of victory of the incumbent mayor in the subsequent elections or the gender of the opponent are most likely different. On the other hand, the variable on which we implement the balance checks refers to a second term during the current election.

Following Table 3, we report the OLS estimates and two different specifications for the RDD estimates. Panel B reports results for different measures of transfers for capital investment: (log of per-capita) total transfers for capital investment (columns 1 to 3), (log of per-capita) discretionary transfers for capital investment (columns 4 to 6) and (log of per-capita) non-discretionary transfers for capital investment (columns 7 to 9). Our RDD estimates show that women attract significantly more transfers for capital investment for their municipalities. These results are driven by discretionary transfers, as we find no significant differences for non-discretionary transfers. This result is reassuring, as non-discretionary transfers for capital investment are rule-based and thus should not be affected by the gender of the mayor. In terms of economic magnitude, our results show that female mayors attract about 60 percent more transfers for capital investment than their male counterparts. These results are confirmed by visual inspection of Figure 7. In Brazil, the effort of the mayor in attracting these transfers is not the only determinant of the amount of transfers these municipalities receive. The interest of the (state or federal) legislature and executive power in providing resources to municipalities is another important determinant. It is therefore particularly reassuring that among our balance tests we include whether the mayor is aligned with the parties in the coalition of the federal president, with the party of the elected state and federal deputy elected that were most voted in the municipality, and with the party of the state governor. For these balance checks we find that male and female mayors elected in close elections have an equal probability of being aligned with higher order officials. So the differences be find between male and female mayors in terms of discretionary transfers are unlikely to be driven by party alignment.[33]

Panel C of Table 5 reports the results for our health care outcomes: percentage of women who received at least one prenatal visit (columns 1 to 3) and percentage of births in which the baby was not premature (columns 4 to 6). According to our RDD estimates in columns 2 and 3, the percentage of women with at least one prenatal visit is higher in municipalities headed by female mayors. We find that the share of pregnant women that receive at least one prenatal visit increases by about 1.6 percentage points (an increase of about 1.25 percent). Moreover, in these municipalities, the probability of a regular birth (e.g., non-premature)

[33]As a falsification test, we also performed RDD estimations on automatic constitutional transfers from the federal government (FPM), which in principle cannot be affected neither by the federal nor the local government, and found no effect of gender on their allocation.

is relatively higher. According to our RDD estimates in column 5 and 6, the fraction of regular births (i.e. non-premature ones) increases by 1 percentage points (an increase of 1.05 percent) in municipalities headed by female mayors.[34] The relatively small magnitude of these effects reflects the fact that in most municipalities most women receive at least one prenatal medical visit (the mean of this variable for our sample of mixed gender races is 97.4 percent) and that most of the births are non-premature (sample mean of 94.6 percent).

Panel D of Table 5 reports the results for our education outcomes related to the physical infrastructure used for education. Columns 1 to 3 report the results for the share of municipal public schools with a library. Columns 4 to 6 report the results for the share of municipal public schools with a science lab. Columns 7 to 9 report the results for the share of municipal public schools with internet. We don't find any evidence that male mayors do a better job in providing educational public goods. These results are confirmed by visual inspection of Figure 8.

In Table 6 we analyze the hypothesis that female mayors face a different competition than men when running for reelection. If women faced a stronger competition this could potentially explain why female mayors are less likely to be reelected. We consider both the quantity (number) and the quality of candidates challenging the incumbent for reelection. Following Besley, Montalvo and Reynal-Querol (2011) we measure quality using the education of the political candidates. Columns 1 to 3 report results analyzing the (log of) number of candidates. Columns 4 to 6 report results for the (log of) number of candidates with at least college degree. Columns 7 to 9 report results for the (log of) number of candidates with at least high school degree. We do not find any evidence that female mayors are more likely to face tougher competition compared to their male counterparts. These results are confirmed by visual inspection of Figure 8.

4.4 Validity Tests and External Validity

RDD estimates in close races rely on the assumption that political candidates cannot manipulate the electoral outcomes. To test this assumption, we conduct several robustness checks. First, we check for nonrandom sorting by visually inspecting the histogram of the margin of

[34] To the best of our knowledge, the only other health outcome that is readily available at the municipal level from Brazilian data is birth weight. We found no evidence that this is affected by the gender of the mayor.

victory and verify that there are no spikes at the right or the left-hand side of the discontinuity (see Appendix Figure A1). Second, we address the concern of non-random sorting by formally testing the continuity of the density of the margin of victory, following McCrary (2008), in Appendix Figure A2. This procedure tests the null hypothesis of continuity of the density of the margin of victory at the zero threshold, and it is implemented by running kernel local linear regressions of the log of the density separately on both sides of zero. We find no evidence of discontinuities in the margin of victory of the female candidate.

Throughout the paper, we have provided evidence that supports the view that gender differences in patronage and campaign contributions could explain why male mayors have a higher reelection probability, despite being more likely to engage in corruption. If this is the case, then we should see that our results hold for the subsample of municipalities where the mayor is eligible to run for reelection, e.g. the same sample we use for our reelection outcomes. We re-estimate our results, restricting our sample to municipalities where mayors are eligible to run for reelection. Appendix Tables A1 to A5 report the results. Our main results are virtually unchanged in this sample, with the exception of corruption. For this outcome, we find similar point estimates as for the whole sample but we lose statistical significance because of the smaller sample size.

Our empirical strategy is valid for municipalities with a close mixed gender election. However, it is possible that our results do not generalize to the rest of Brazilian municipalities. In Appendix Table A6 we compare the municipality and mayoral characteristics in our sample to the rest of Brazilian municipalities and mayors. Municipalities in our sample are smaller and poorer than the rest of Brazilian municipalities. They are also more likely to be have a higher gender wage gap in the labor market.

A possible concern when performing a regression discontinuity design is that results might be driven by the specific functional forms considered. Our baseline results are obtained using a third order polynomial. In unreported robustness tests, we also find similar results using a second- or fourth-order polynomials and local linear specification using optimal bandwidths with different methodologies. To further alleviate concerns arising from the specific RDD functional forms considered, we repeated the analysis implementing a simple t-test of the means of all of our outcomes in closed intervals around the threshold $MV = 0$ (with intervals getting smaller and smaller) and in most cases found statistically significant differences between municipalities headed by women and men. We report these results in Table A7 in the Appendix.

Finally, we performed a set of placebo tests to rule out the possibility that our results arise from random chance rather than a true underlining causal relationship. To do this, in the spirit of DellaVigna and La Ferrara (2012), for all our outcome variables we conduct a set of RDD estimations at false thresholds of the margin of victory. In particular, for each outcome we estimated 580 RDD regressions considering fake margins of victory between 30 percent and 1 percent below and above the threshold (using increments of 0.1 percent). In Appendix Figures A3 to A6 we plot the cumulative density function of the t-statistics of the fake treatment effects from these regressions. At these false thresholds, we expect to find no systematic evidence of treatment effects.[35] The figures show that most of the coefficients from these placebo tests are not statistically significant, providing strong support to the robustness of our main results. Finally, as a falsification test, we also performed RDD estimations on automatic constitutional transfers from the federal government (FPM), which in principle cannot be affected neither by the federal nor the local government, and found no effect of gender on their allocation (results are available upon request).

For most of our empirical results, the size of the effect of gender in the RDD estimates is larger, and more likely to be statistically different from zero, than the effect estimated by the OLS specifications. This could be explained by at least two reasons. First, the RD design controls for municipality-specific confounding factors, which might attenuate the effect estimated using OLS.[36] Second, the RD coefficient is identified by close elections, whereas the OLS coefficient averages over all races (competitive and non-competitive races). If politicians of different genders behave differently in competitive and non-competitive races, this could explain the differences between OLS and RDD coefficients.

[35]The figure reports the t-test from a specification with 3^{rd}-order polynomial; results are virtually unchanged with a local linear specification in an optimal bandwidth.

[36]Our empirical strategy controls for unobservable municipality-specific confounding factors, but it is still possible that some individual level characteristics are correlated with the gender of the mayor. While we acknowledge this limitation, which is probably the main empirical challenge for this literature, we believe that it is reassuring that all of our individual level observable variables converge in close elections, as confirmed by visual inspection of Figures 3, and 4.

5 Conclusion

This paper provides new evidence on the effect of the gender of the policymaker on possible different dimensions of corruption in the municipal administration. By using an administrative measure of corruption based on random government audits and using a Regression Discontinuity (RD) design in close electoral races, we show that female mayors are less likely to be involved in corruption. We also find that male mayors are more likely to increase temporary public employment, especially during the electoral year, a sign of electoral patronage. In addition, male mayors attract more campaign contributions when they run for re-election.

We then look at the reelection outcomes of these mayors. We find that female mayors are less likely to be reelected to office compared to their male counterparts. Our results suggest that, despite being more corrupt, male mayors are more likely to be reelected due to their involvement in strategic activities to gain re-election. We discuss other interpretations that receive less support in the data.

Our results raise a number of additional questions for future research. First, we are able to identify our effects in close elections, characterized by a high degree of competition. Our identification strategy does not allow us to identify the link between gender and policies in situations characterized by absence of electoral competition. Competition might *per se* enhance gender differences. A rapidly growing literature is making political competition an endogenous variable that can be chosen to maximize voters' welfare (Caselli et al., 2012). It is an exciting direction for future research to examine how a change in the degree of electoral competition may affect differentially the gender differences that we find.

Second, and related to the previous point, our results are obtained in a setting where female politicians can face competition from male politicians. It is thus not clear whether these findings would also apply to a setting with quotas reserved for female politicians.[37] In fact, an interesting direction for future research would be to understand whether policies aimed at increasing female participation in politics through quotas that restrict cross-gender competition have different implications than policies aimed at increasing the number of women competing in open elections.

Finally, it is unclear whether our results would persist in countries with different attitudes

[37] See Fréchette, Maniquet and Morelli (2008), De Paola, Scoppa and Lombardo (2010), Pande and Ford (2011) and Besley et al. (2012) for analyses of the effects of introducing gender quotas in different settings.

toward women compared to Brazil. Recent research suggests different channels through which attitudes toward women may affect policies and outcomes (Goldin and Rouse, 2000; Beaman et al., 2009; Pino, 2011; Givati and Troiano, 2012). Policymakers may benefit from explicitly accounting for those slow-moving constraints when designing policies aimed at increasing the participation of women in politics.

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Table 1: Summary Statistics – Municipalities with a Female Mayors vs Municipalities with a Male Mayor

	(1) Female Mayor	(2) obs	(3) Male Mayor	(4) obs	(5) p-value
Municipal characteristics					
Population	12,492	316	12,220	407	0.846
Income per-capita (R$)	131	316	131	407	0.977
Literacy rate	0.500	316	0.504	407	0.649
Urban	0.556	316	0.553	407	0.847
Water supply	0.549	316	0.549	407	0.968
Electricity	0.839	316	0.839	407	0.990
Sewerage supply	0.170	316	0.170	407	0.994
Radio	0.118	316	0.103	407	0.541
Wage gap	0.097	316	0.104	407	0.460
Absenteeism	0.179	316	0.174	407	0.438
North	0.089	316	0.081	407	0.718
Northeast	0.494	316	0.482	407	0.747
Center	0.092	316	0.096	407	0.853
South	0.130	316	0.128	407	0.937
Southeast	0.196	316	0.214	407	0.563
Mayoral characteristics					
Term limit	0.259	316	0.364	407	0.003
Politician	0.121	316	0.106	407	0.487
Age	52	316	54	407	0.117
College	0.485	316	0.332	407	0.000
High school	0.920	316	0.779	407	0.000
Primary school	0.080	316	0.221	407	0.000
Married	0.744	316	0.804	407	0.047
President coalition	0.228	316	0.263	407	0.282
State governor party	0.203	316	0.201	407	0.972
Federal deputy party	0.335	316	0.346	407	0.758
State deputy party	0.291	316	0.305	407	0.707
PSDB	0.156	316	0.165	407	0.789
DEM	0.216	316	0.209	407	0.828
PMDB	0.244	316	0.209	407	0.262
PT	0.019	316	0.039	407	0.116
Outcomes					
Charges of corruption	0.780	59	0.853	102	0.240
Temporary public employees	120	166	135	215	0.468
Permanent public employees	344	166	336	215	0.830
Fraction of temporary public employees	0.243	166	0.263	215	0.207
Fraction of temporary public employees first year	0.247	166	0.258	215	0.526
Fraction of temporary public employees last year	0.234	166	0.260	215	0.146
Campaign Contributions	39,548	114	74,834	140	0.043
Re-run	0.530	234	0.564	259	0.453
reelection	0.299	234	0.390	259	0.034
Non-discretionary transfers	12	316	14	407	0.483
Discretionary transfers	37	316	34	407	0.486
Total transfers	49	316	48	407	0.805
Non premature births	0.950	316	0.950	407	0.978
Any prenatal visits	0.974	316	0.974	407	0.933
% of schools with internet	0.239	316	0.238	407	0.953
% of schools with science lab	0.113	316	0.109	407	0.833
% of schools with library	0.373	316	0.383	407	0.705
N. of candidates	2.519	316	2.587	407	0.290
N. of candidates with at least higher education	1.225	316	1.269	407	0.543
N. of candidates with at least college	1.073	316	1.087	407	0.845

Notes. *Female* considers the two-candidates mixed races sample where the winner candidate is woman and the loser candidate is a man. *Male* considers the two-candidates mixed races sample where the winner candidate is a man and the loser candidate is a woman. Columns (1) and (3) report the average values in the respective samples; *obs* is the number of observations; *p-value* refers to the statistical significance of the difference between means. See Table 7 for the definition of the variables.

Table 2: Discontinuities of Town and Mayoral Characteristics in Mixed Close Races, RDD Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Panel A: Brazilian Macro-regions														
	Southeast	South	Center	Northeast	North									
Female	-0.003	0.083	0.055	-0.145	0.010									
	(0.069)	(0.062)	(0.053)	(0.091)	(0.047)									
Observations	723	723	723	723	723									
Panel B: Pre-determinant Municipalities Characteristics														
	Population	Income	Urban	Literacy rate	Electricity supply	Water supply	Sewer	Radio	Wage gap	Absenteeism				
Female	-226	9.368	-0.011	0.024	0.027	0.015	-0.034	0.043	-0.011	0.008				
	(2,647)	(14.357)	(0.035)	(0.024)	(0.032)	(0.040)	(0.041)	(0.050)	(0.026)	(0.015)				
Observations	723	723	723	723	723	723	723	723	723	723				
Panel C: Mayoral Characteristics														
	Term limit	Politician	College	High school	Primary school	Married	President coalition	State governor party	Federal deputy party	State deputy party	PSDB	DEM	PMDB	PT
Female	-0.014	0.018	0.066	0.109	-0.109	-0.035	-0.021	0.048	0.013	0.032	0.042	-0.076	0.011	-0.018
	(0.079)	(0.061)	(0.086)	(0.067)	(0.067)	(0.075)	(0.077)	(0.071)	(0.086)	(0.083)	(0.070)	(0.074)	(0.075)	(0.030)
Observations	723	723	723	723	723	723	723	723	723	723	723	723	723	723

Notes. This table shows the estimated discontinuities of municipality characteristics at the threshold of zero Margin of Victory of the female candidate ($MV_{it} = 0$). RDD specifications with split polynomial of Margin of Victory. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***. See Table 7 for the definition of the variables.

Table 3: The Impact of Gender on Corruption, Campaign Contributions and Municipal Public Employment, RDD Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Impact of Gender on Corruption and Campaign Contributions									
Dep. Variable	Charges of corruption			Campaign contribution (log)					
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR			
Female	-0.063	-0.350**	-0.291**	-0.337**	-0.809*	-0.764*			
	(0.063)	(0.146)	(0.142)	(0.160)	(0.483)	(0.446)			
Observations	161	161	103	254	254	162			
Optimal h			16			15			
Panel B:Impact of Gender on Municipal Public Employment									
Dep. Variable	N. of temporary public employees (log)			N. of permanent public employees (log)			Fraction of temporary public employees		
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR
Female	-0.072	-0.659**	-0.652**	0.017	0.102	0.074	-0.020	-0.095**	-0.093**
	(0.109)	(0.320)	(0.290)	(0.074)	(0.191)	(0.181)	(0.016)	(0.039)	(0.038)
Observations	381	381	229	381	381	219	381	381	233
Optimal h			15			14			15

Notes. This table shows results for OLS, RDD 3^{rd} order spline polynomial and local linear regressions with optimal bandwidth calculated as in Calonico, Cattaneo and Titiunik (2014). RDD specifications with split polynomial and local linear regression following equations (4) and (5), respectively. h denotes the interval of our running variable. For instance h=10 represents mixed gender races where margin of victory is between -10% and 10%. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***. See Table 7 for the definition of the variables.

Table 4: The Impact of Gender on Municipal Public Employment
First and Last Year of Mayoral Mandate, RDD Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Variable	Fraction of temporary public employees - first year of mayoral mandate			Fraction of temporary public employees - last year of mayoral mandate		
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR
Female	-0.010	-0.036	-0.017	-0.026	-0.136***	-0.112***
	(0.016)	(0.044)	(0.045)	(0.018)	(0.043)	(0.040)
Observations	381	381	193	381	381	252
Optimal h			12			17

Notes. This table shows results for OLS, RDD 3^{rd} order spline polynomial and local linear regressions with optimal bandwidth calculated as in Calonico, Cattaneo and Titiunik (2014). RDD specifications with split polynomial and local linear regression following equations (4) and (5), respectively. h denotes the interval of our running variable. For instance h=10 represents mixed gender races where margin of victory is between -10% and 10%. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***. See Table 7 for the definition of the variables.

Table 5: The Impact of Gender on Other Outcomes, RDD Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A:Impact of Gender on Reelection Outcomes									
Dep. Variable	Reelected			Rerun					
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR			
Female	-0.092**	-0.220**	-0.183*	-0.035	0.042	0.019			
	(0.043)	(0.103)	(0.102)	(0.045)	(0.115)	(0.116)			
Observations	493	493	296	493	493	289			
Optimal h			14			13			
Panel B: The Impact of Gender on Transfers for Capital Investment									
Dep. Variable	Total transfers (log)			Discretionary transfers (log)			Non-discretionary transfers (log)		
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR
Female	0.076	0.405**	0.392**	0.190**	0.474***	0.467**	-0.126	0.068	-0.098
	(0.076)	(0.160)	(0.166)	(0.087)	(0.178)	(0.187)	(0.099)	(0.209)	(0.216)
Observations	723	723	428	723	723	428	723	723	401
Optimal h			15			15			14
Panel C: The Impact of Gender on Health Outcomes									
Dep. Variable	Any prenatal visits			Non-premature births					
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR			
Female	0.000	0.016**	0.012*	0.000	0.012**	0.010*			
	(0.003)	(0.007)	(0.006)	(0.003)	(0.006)	(0.006)			
Observations	723	723	420	723	723	468			
Optimal h			15			17			
Panel D: The Impact of Gender on Education Outcomes									
Dep. Variable	% of schools with library			% of schools with science lab			% of schools with internet		
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR
Female	-0.010	0.004	-0.026	0.003	0.008	-0.007	0.002	-0.003	0.050
	(0.026)	(0.062)	(0.063)	(0.017)	(0.035)	(0.034)	(0.023)	(0.053)	(0.049)
Observations	723	723	426	723	723	454	723	723	505
Optimal h			15			17			20

Notes. This table shows results for OLS, RDD 3^{rd} order spline polynomial and local linear regressions with optimal bandwidth calculated as in Calonico, Cattaneo and Titiunik (2014). RDD specifications with split polynomial and local linear regression following equations (4) and (5), respectively. h denotes the interval of our running variable. For instance h=10 represents mixed gender races where margin of victory is between -10% and 10%. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***. See Table 7 for the definition of the variables.

Table 6: The Impact of Gender on the Quality of Candidates in Future Races, RDD Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dep. Variable	Number of candidates (log)			Number of candidates with college degree (log)			Number of candidates with high school degree (log)		
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR
Female	-0.016	0.011	0.002	-0.011	0.008	-0.027	-0.023	0.050	0.027
	(0.016)	(0.039)	(0.039)	(0.035)	(0.081)	(0.087)	(0.034)	(0.082)	(0.086)
Observations	723	723	428	723	723	393	723	723	412
Optimal h			15			13			14

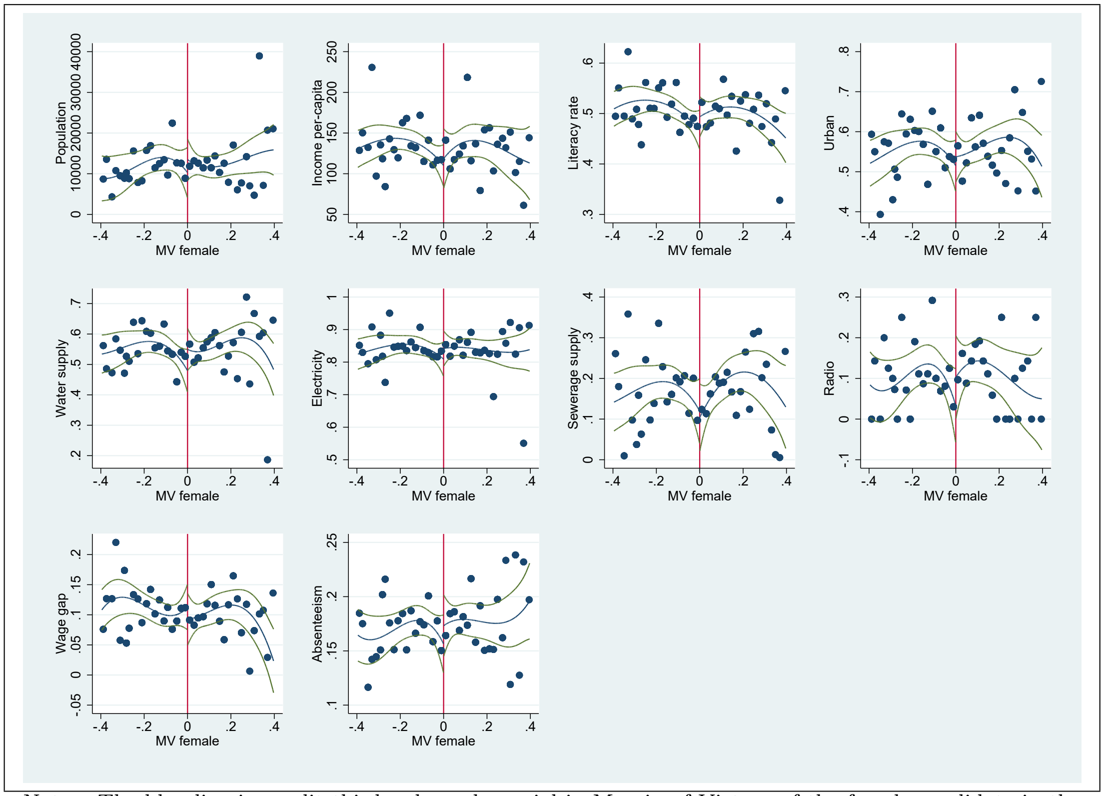
Notes. This table shows results for OLS, RDD 3^{rd} order spline polynomial and local linear regressions with optimal bandwidth calculated as in Calonico, Cattaneo and Titiunik (2014). RDD specifications with split polynomial and local linear regression following equations (4) and (5), respectively. h denotes the interval of our running variable. For instance h=10 represents mixed gender races where margin of victory is between -10% and 10%. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***. See Table 7 for the definition of the variables.

Table 7: The Definition of the Variables

Panel A: Municipal Characteristics	
Income	per-capita income in 2000 in Brazilian *reais* .
Population	number of inhabitants.
Literacy rate	fraction of people above age 20 who are literate.
Urbanization	fraction of people living in urban areas.
Electricity	fraction of houses with access to electricity.
Water	fraction of houses linked to the water system.
Sewer	fraction of houses linked to the sewerage system.
Radio	equals one if there is at least one local radio station in the municipality.
Absenteeism	fraction of voters that did not vote.
Gender wage gap	estimated gender salary gap.
North	Brazilian North-region
Northeast	Brazilian Northeast-region
Center	Brazilian Center-region
South	Brazilian South-region
Southeast	Brazilian Southeast-region
Area	area size of the municipality.
Panel B: Politician Characteristics	
Primary school	equal to one if the mayor has at most an elementary school degree.
High school	equal to one if the mayor has at least high school degree.
College	equal to one if the mayor has at least college degree.
Married	equal to one if the mayor is married.
Politician	equal to one if the mayor has previous experience in politics.
Term limit	equal to one if the mayor is not eligible to run for reelection.
Age	age of the candidate at the time of the elections.
PSDB	equal to one if the mayor belongs to the PSDB political party.
DEM	equal to one if the mayor belongs to the DEM political party.
PMDB	equal to one if the mayor belongs to the PMDB political party.
PT	equal to one if the mayor belongs to the PT political party.
President coalition	equal to one if the mayor is affiliated with a party belonging to the president's coalition.
State governor party	equal to one if the mayor is affiliated with the state governor's party
Federal deputy party	equal to one if the mayor is affiliated with the party of the most voted elected federal deputy in the municipality
State deputy party	equal to one if the mayor is affiliated with the party of the most voted elected state deputy in the municipality
Panel C: Outcome Variables	
Charges of corruption	equal to one if at least one episode of corruption is reported.
Temporary public employees	number of temporary public employees in the municipal administration.
Permanent public employees	number of permanent public employees in the municipal administration.
Fraction of temporary public employees	number of temporary public employees divided by total number public employees that work directly in the municipal administration.
Fraction of temporary public employees first year	number of temporary public employees divided by total number public employees during the first year of the mandate.
Fraction of temporary public employees last year	number of temporary public employees divided by total number public employees during the last year of the mandate.
Campaign contributions	total amount of campaign contributions (in Reais R$) to a specific candidate.
Re-election	equal to one if the incumbent mayor is reelected.
Re-run	equal to one if the incumbent mayor runs in the subsequent election.
Discretionary transfers	yearly federal and state discretionary transfers to municipalities earmarked for capital investment in all sectors (per-capita values in 2000 Brazilian *reais*).
Non-discretionary transfers	yearly federal and state non-discretionary transfers to municipalities earmarked for capital investment in all sectors (log of per-capita values in 2000 Brazilian *reais*).
Total transfers	total yearly federal and state transfers to municipalities earmarked for capital investment in all sectors (log of per-capita values in 2000 Brazilian *reais*).
Any prenatal visits	fraction of pregnant women with at least one prenatal visit before delivery.
Non premature births	fraction of births that are not premature.
% of schools with library	share of schools with library
% of schools with science lab	share of schools with science lab
% of schools with internet	share of schools with access to internet
Number of candidates	number of candidates for mayor in the subsequent future race
Number of candidates with college	number of candidates for mayor in the subsequent future race with at least college degree
Number of candidates with high education	number of candidates for mayor in the subsequent future race with at least high school degree

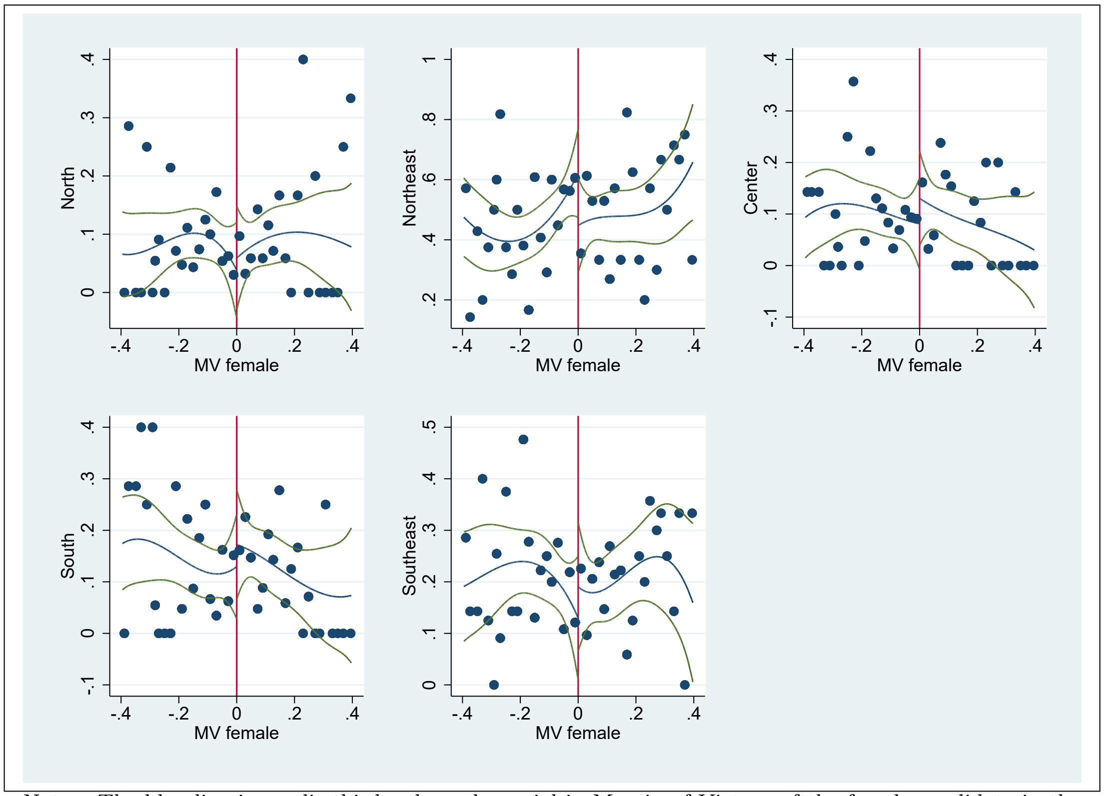
Notes. This table shows the definition of the variables used in our analyses.

Figure 1: Balance Tests – Pre-Treatment Municipal Characteristics



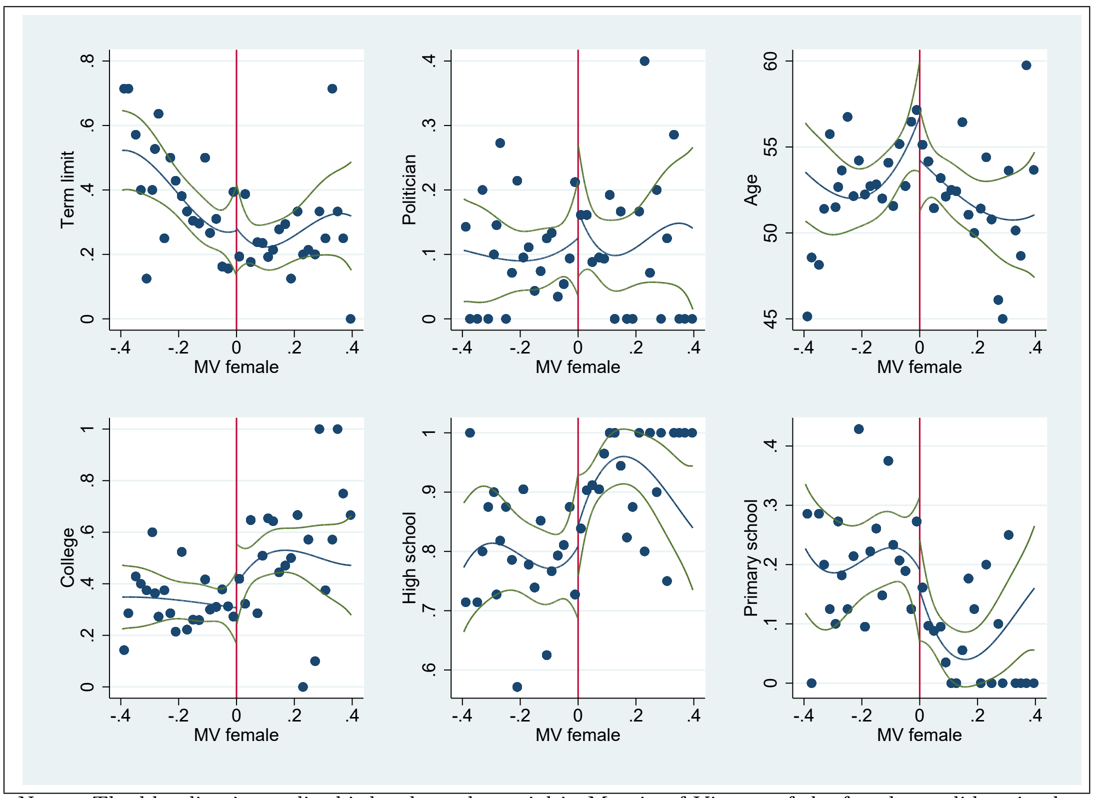
Notes. The blue line is a split third-order polynomial in Margin of Victory of the female candidate in the municipality i and mandate t, fitted separately on each side of the margin of victory (MV female) thresholds at zero. $MV_{it} > 0$ when the winner candidate in the municipality i and mandate t is female, $MV_{it} < 0$ when the winner candidate in the municipality i and mandate t is male. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. This sample considers races in 2000 and 2004 municipal elections. *Gender wage gap* is the estimated gender salary gap, see paper for details about the estimation of this variable. See Table 7 for the definition of the variables.

Figure 2: Balance Tests – Invariant Municipal Characteristics



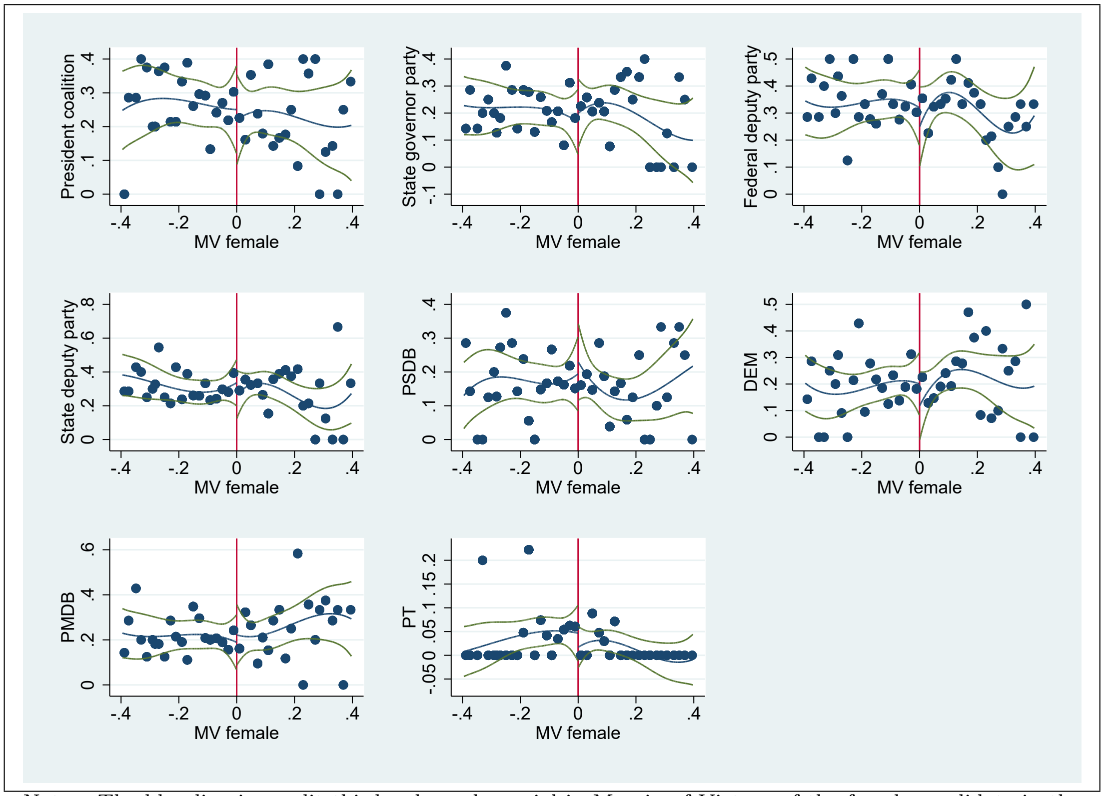
Notes. The blue line is a split third-order polynomial in Margin of Victory of the female candidate in the municipality i and mandate t, fitted separately on each side of the margin of victory (MV female) thresholds at zero. $MV_{it} > 0$ when the winner candidate in the municipality i and mandate t is female, $MV_{it} < 0$ when the winner candidate in the municipality i and mandate t is male. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. This sample considers races in 2000 and 2004 municipal elections. *North*, *Northeast*, *Center*, *South*, and *Southeast* are the Brazilian macro-regions. *Area* refers to the area size of the municipality.

Figure 3: Balance Checks– Mayoral Education and Political Experience



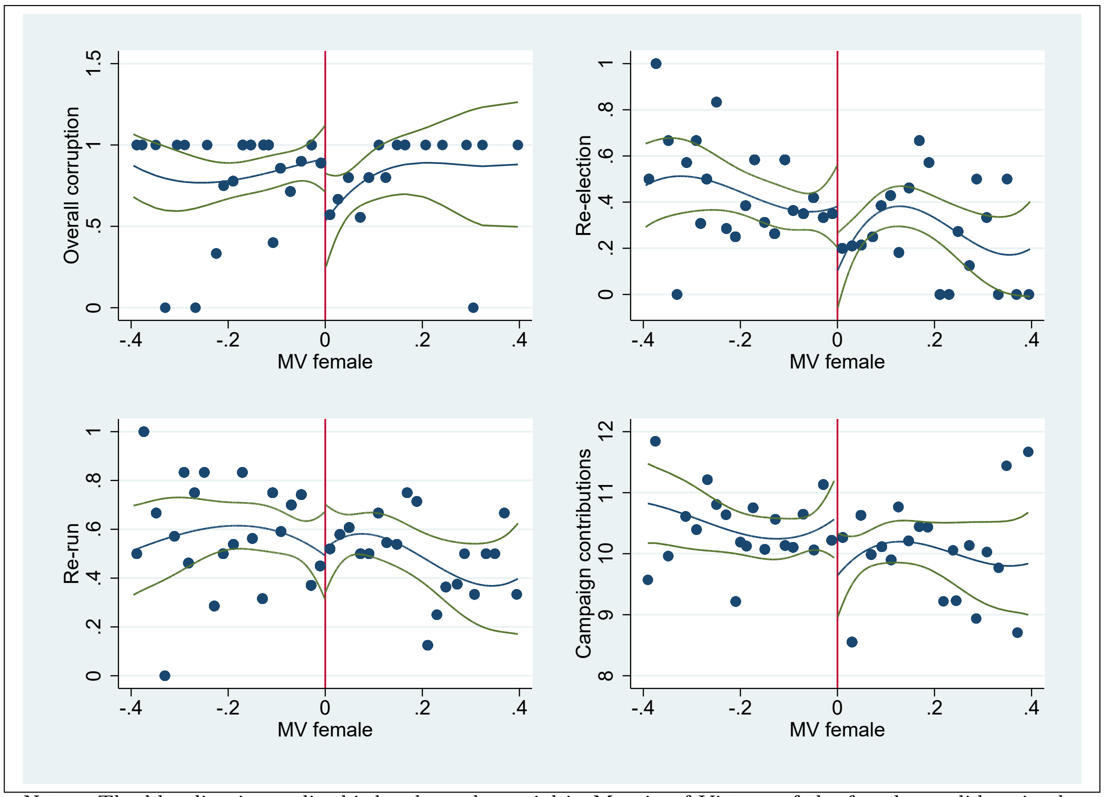
Notes. The blue line is a split third-order polynomial in Margin of Victory of the female candidate in the municipality i and mandate t, fitted separately on each side of the margin of victory (MV female) thresholds at zero. $MV_{it} > 0$ when the winner candidate in the municipality i and mandate t is female, $MV_{it} < 0$ when the winner candidate in the municipality i and mandate t is male. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. This sample considers races in 2000 and 2004 municipal elections. See Table 7 for the definition of the variables.

Figure 4: Balance Checks – Mayoral Political Party Affiliation



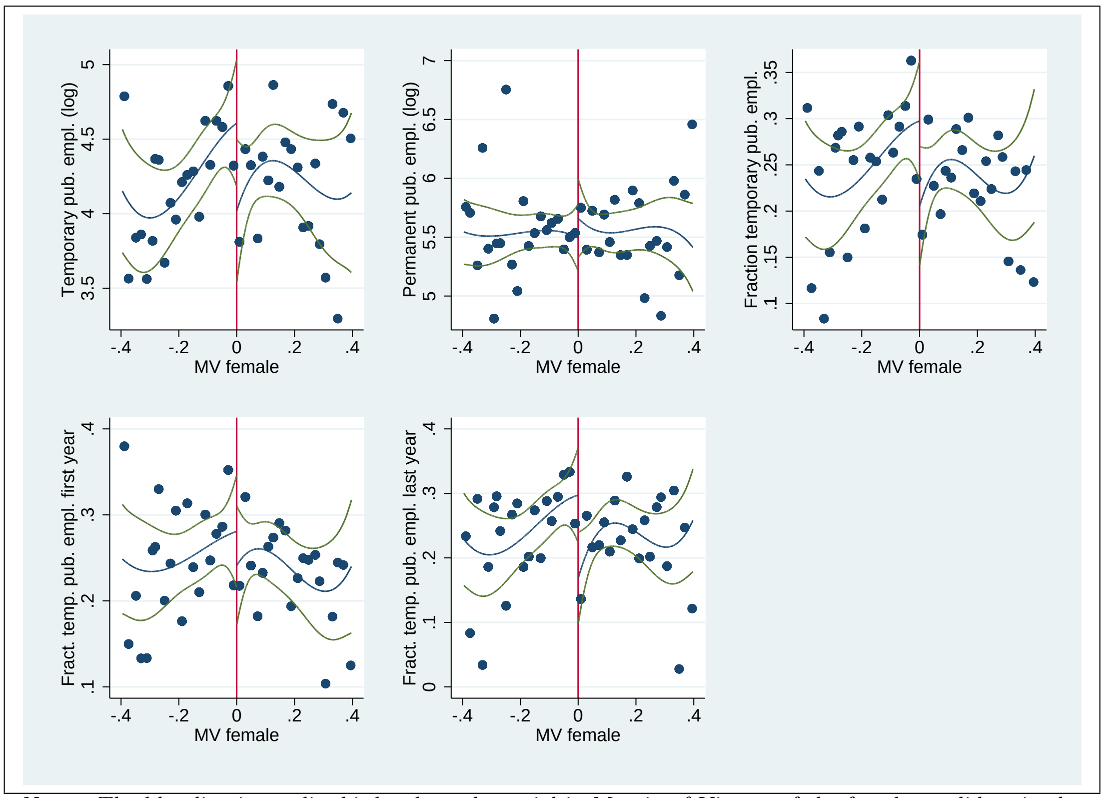
Notes. The blue line is a split third-order polynomial in Margin of Victory of the female candidate in the municipality i and mandate t, fitted separately on each side of the margin of victory (MV female) thresholds at zero. $MV_{it} > 0$ when the winner candidate in the municipality i and mandate t is female, $MV_{it} < 0$ when the winner candidate in the municipality i and mandate t is male. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. This sample considers races in 2000 and 2004 municipal elections. See Table 7 for the definition of the variables.

Figure 5: The Effects of Gender on Corruption, Electoral Outcomes and Campaign Contributions



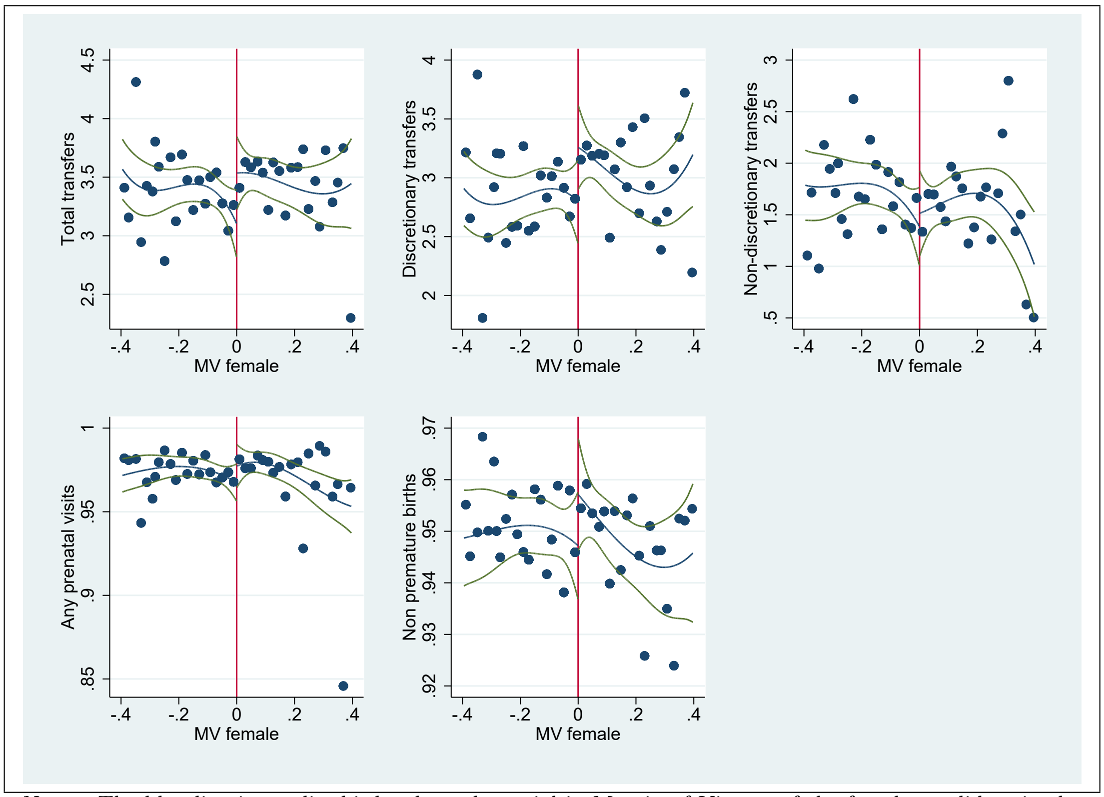
Notes. The blue line is a split third-order polynomial in Margin of Victory of the female candidate in the municipality i and mandate t, fitted separately on each side of the margin of victory (MV female) thresholds at zero. $MV_{it} > 0$ when the winner candidate in the municipality i and mandate t is female, $MV_{it} < 0$ when the winner candidate in the municipality i and mandate t is male. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. This sample considers races in 2000 and 2004 municipal elections. See Table 7 for the definition of the variables.

Figure 6: The Effects of Gender on Municipal Public Employment



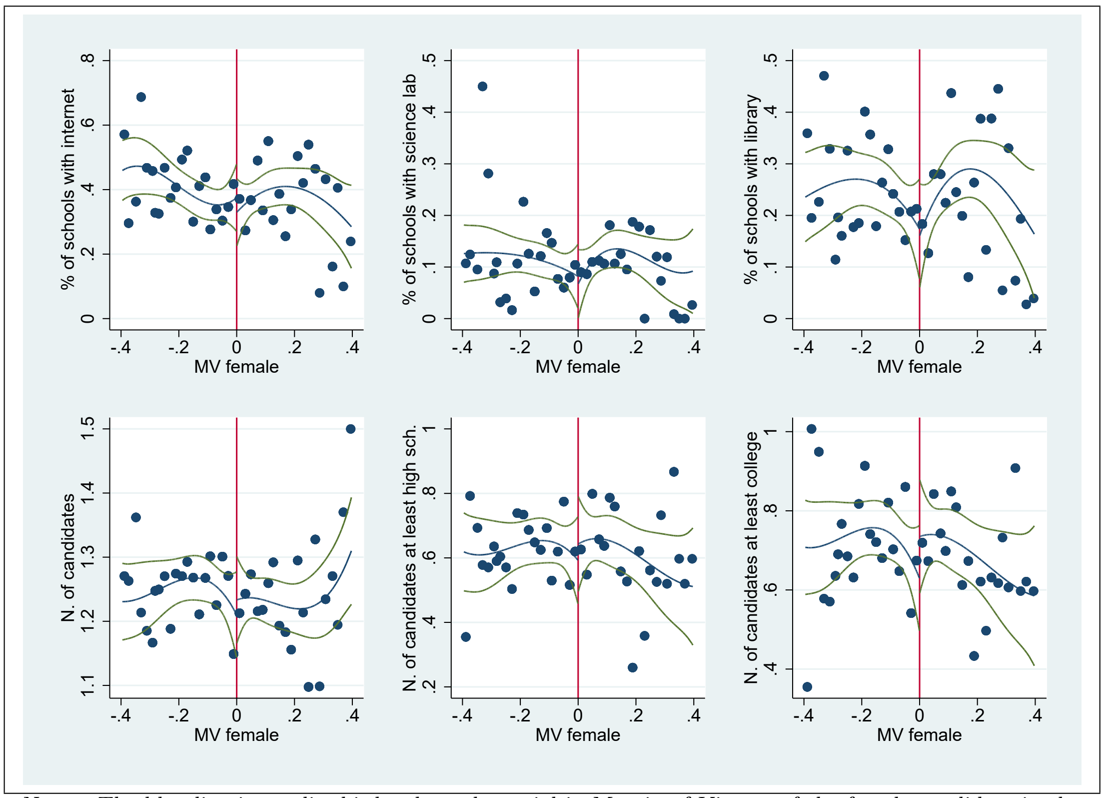
Notes. The blue line is a split third-order polynomial in Margin of Victory of the female candidate in the municipality i and mandate t, fitted separately on each side of the margin of victory (MV female) thresholds at zero. $MV_{it} > 0$ when the winner candidate in the municipality i and mandate t is female, $MV_{it} < 0$ when the winner candidate in the municipality i and mandate t is male. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. The sample for reelections probabilities considers races in 2000 and 2004 municipal elections. The sample for public employment considers races in 2004 municipal elections. See Table 7 for the definition of the variables.

Figure 7: The Effects of Gender on Transfers for Capital Investment and Health



Notes. The blue line is a split third-order polynomial in Margin of Victory of the female candidate in the municipality i and mandate t, fitted separately on each side of the margin of victory (MV female) thresholds at zero. $MV_{it} > 0$ when the winner candidate in the municipality i and mandate t is female, $MV_{it} < 0$ when the winner candidate in the municipality i and mandate t is male. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. The sample for reelections probabilities considers races in 2000 and 2004 municipal elections. The sample for public employment considers races in 2004 municipal elections. See Table 7 for the definition of the variables.

Figure 8: The Effects of Gender on Future Races and Education



Notes. The blue line is a split third-order polynomial in Margin of Victory of the female candidate in the municipality i and mandate t, fitted separately on each side of the margin of victory (MV female) thresholds at zero. $MV_{it} > 0$ when the winner candidate in the municipality i and mandate t is female, $MV_{it} < 0$ when the winner candidate in the municipality i and mandate t is male. The green lines are the 95 percent confidence interval of the polynomial. Scatter points are averaged over 2 percent intervals. The sample for reelections probabilities considers races in 2000 and 2004 municipal elections. The sample for public employment considers races in 2004 municipal elections. See Table 7 for the definition of the variables.

Appendix (For Online Publication)

This Appendix provides additional summary statistics, results and robustness checks, which are also discussed in the paper. In particular, we present the following:

- Summary statistics for our mixed gender races sample in municipalities where the mayor is eligible to run for reelection (Table A1);
- Discontinuities of town and mayoral characteristics in mixed close races in municipalities where the mayor is eligible to run for reelection (Table A2);
- Results for the impact of gender on corruption and municipal public employment, in municipalities where the mayor is eligible to run for reelection (Table A3);
- Results for the impact of gender on municipal public employment, by first and last year of the electoral mandate, in municipalities where the mayor is eligible to run for reelection (Table A4);
- Results for the impact of gender on other outcomes, in municipalities where the mayor is eligible to run for reelection (Table A5);
- Summary statistics for the two-candidates mixed gender races sample versus other races (Table A6);
- T-test of the outcomes in close elections with different intervals of margin of victory of the female candidate (Table A7);
- Frequency of margin of victory for the two-candidates mixed-gender races (Figure A1);
- McCrary Test, Two Candidates Mixed-Gender Races (Figure A2);
- Placebo tests based on permutation methods for all our outcomes (Figure A3, A4, A5, and A6).

Table A1: Summary Statistics – Municipalities with a Female Mayors vs Municipalities with a Male Mayor – When the Mayor is Eligible to Run for Reelection

	(1) Female Mayor	(2) obs	(3) Male Mayor	(4) obs	(5) p-value
Municipal characteristics					
Population	11,701	234	13,344	259	0.347
Income per-capita (R$)	131	234	131	259	0.980
Literacy rate	0.509	234	0.503	259	0.625
Urban	0.565	234	0.554	259	0.546
Water supply	0.561	234	0.540	259	0.324
Electricity	0.842	234	0.836	259	0.715
Sewerage supply	0.175	234	0.183	259	0.730
Radio	0.125	234	0.112	259	0.667
Wage gap	0.106	234	0.105	259	0.943
Absenteeism	0.181	234	0.176	259	0.623
North	0.090	234	0.085	259	0.851
Northeast	0.457	234	0.471	259	0.760
Center	0.107	234	0.093	259	0.600
South	0.141	234	0.116	259	0.404
Southeast	0.205	234	0.236	259	0.418
Mayoral characteristics					
Politician	0.075	234	0.057	259	0.441
Age	51	234	53	259	0.125
College	0.510	234	0.375	259	0.002
Higer education	0.944	234	0.819	259	0.000
Primary education	0.056	234	0.181	259	0.000
President coalition	0.270	234	0.293	259	0.559
State governor party	0.192	234	0.170	259	0.519
Federal deputy party	0.303	234	0.301	259	0.957
State deputy party	0.265	234	0.247	259	0.651
PSDB	0.131	234	0.147	259	0.618
DEM	0.197	234	0.197	259	0.998
PMDB	0.223	234	0.205	259	0.628
PT	0.026	234	0.050	259	0.159
Outcomes					
Charges of corruption	0.775	40	0.863	66	0.243
Temporary public employees	106	132	150	150	0.071
Permanent public employees	334	132	335	150	0.974
Fraction of temporary public employees	0.243	132	0.276	150	0.088
Fraction of temporary public employees first year	0.246	132	0.266	150	0.285
Fraction of temporary public employees last year	0.235	132	0.275	150	0.066
Re-run	0.530	234	0.564	259	0.453
reelection	0.299	234	0.390	259	0.034
Non-discretionary transfers	12	234	12	259	0.814
Discretionary transfers	33	234	36	259	0.577
Total transfers	45	234	48	259	0.543
Non premature births	0.948	234	0.950	259	0.691
Any prenatal visits	0.975	234	0.975	259	0.846
% of schools with internet	0.261	234	0.249	259	0.679
% of schools with science lab	0.122	234	0.117	259	0.785
% of schools with library	0.396	234	0.385	259	0.719
N. of candidates	2.521	234	2.575	259	0.491
N. of candidates with at least high school	1.299	234	1.290	259	0.912
N. of candidates with at least college	1.150	234	1.112	259	0.652

Notes. *Female mayor* considers the two-candidates mixed races sample where the winner candidate is woman and the loser candidate is a man. *Male mayor* considers the two-candidates mixed races sample where the winner candidate is a man and the loser candidate is a woman. Columns (1) and (3) report the average values in the respective samples; *obs* is the number of observations; *p-value* refers to the statistical significance of the difference between means. See Table 7 in the paper for the definition of the variables.

Table A2: Discontinuities of Town and Mayoral Characteristics in Mixed Close Races in Municipalities Where the Mayor is Eligible to Run for Reelection, RDD Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Panel B: Panel A: Brazilian Macro-regions												
	Southeast	South	Center	Northeast	North								
Female	-0.063	0.054	0.128*	-0.125	0.006								
	(0.083)	(0.084)	(0.074)	(0.116)	(0.069)								
Observations	493	493	493	493	493								
	Panel B: Pre-determinant Town's Characteristics												
	Population	Income	Urban	Literacy rate	Electricity supply	Water supply	Sewer	Radio gap	Wage	Absenteeism			
Female	-212	4.240	-0.000	0.016	0.019	0.019	-0.069	0.017	-0.001	0.005			
	(3,165)	(18.978)	(0.045)	(0.031)	(0.041)	(0.052)	(0.049)	(0.067)	(0.031)	(0.020)			
Observations	493	493	493	493	493	493	493	493	493	493			
	Panel C: Mayoral Characteristics												
	Politician	College	High school	Primary school	Married	President's coalition	State governor party	Federal deputy party	State deputy party	PSDB	DEM	PMDB	PT
Female	0.060	0.043	0.107	-0.107	-0.054	0.025	0.023	-0.166	0.063	0.006	-0.039	-0.028	-0.007
	(0.071)	(0.112)	(0.080)	(0.080)	(0.096)	(0.103)	(0.091)	(0.109)	(0.107)	(0.083)	(0.093)	(0.094)	(0.037)
Observations	493	493	493	493	492	493	493	493	493	493	493	493	493

Notes. This table shows the estimated discontinuities of municipality characteristics at the threshold of zero Margin of Victory of the female candidate ($MV_{it} = 0$). RDD 3^{rd} order spline polynomial specification of Margin of Victory. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***. See Table 7 in the paper for the definition of the variables.

Table A3: Impact of Gender on Corruption and Municipal Public Employment, in Municipalities Where the Mayor is Eligible to Run for Reelection, RDD Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: The Impact of Gender on Corruption and Administrative Municipal Public Employment												
Dep. Variable	Charges of corruption			N. of temporary public employees (log)			N. of permanent public employees (log)			Fraction of temporary public employees		
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial (log)	LLR	OLS	Spline polynomial (log)	LLR	OLS	Spline polynomial	LLR
Female	-0.083	-0.234	-0.237	-0.157	-0.916**	-0.691*	0.026	0.171	0.132	-0.033*	-0.139***	-0.120***
	(0.072)	(0.201)	(0.179)	(0.125)	(0.369)	(0.356)	(0.083)	(0.217)	(0.211)	(0.019)	(0.046)	(0.043)
Observations	106	106	70	282	282	156	282	282	151	282	282	185
Optimal h			13			13			12			16

Notes. This table shows results for OLS, RDD 3^{rd} order spline polynomial and local linear regressions with optimal bandwidth calculated as in Calonico, Cattaneo and Titiunik (2014). RDD specifications with split polynomial and local linear regression following equations 4 and 5 in the paper, respectively. h denotes the interval of our running variable. For instance h=10 represents mixed gender races where margin of victory is between -10% and 10%. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***. See Table 7 in the paper for the definition of the variables.

Table A4: Impact of Gender on Municipal Public Employment
by First and Last Year of Mayoral Mandate –
When the Mayor is Eligible to Run for Reelection, RDD Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Variable	Fraction of temporary public employees - first year of mayoral mandate			Fraction of temporary public employees - last year of mayoral mandate		
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR
Female	-0.020	-0.083*	-0.071	-0.039*	-0.172***	-0.139***
	(0.018)	(0.049)	(0.048)	(0.021)	(0.050)	(0.048)
Observations	282	282	168	282	282	185
Optimal h			14			16

Notes. This table shows results for OLS, RDD 3^{rd} order spline polynomial and local linear regressions with optimal bandwidth calculated as in Calonico, Cattaneo and Titiunik (2014). RDD specifications with split polynomial and local linear regression following equations equations 4 and 5 in the paper, respectively. h denotes the interval of our running variable. For instance h=10 represents mixed gender races where margin of victory is between -10% and 10%. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***. See Table 7 in the paper for the definition of the variables.

Table A5: Impact of Gender on Other Outcomes – When the Mayor is Eligible to Run for Reelection, RDD Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: The Impact of Gender on Transfers for Capital Investment									
Dep. Variable	Total transfers (log)			Discretionary transfers (log)			Non-discretionary transfers (log)		
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR
Female	0.066	0.408**	0.508**	0.113	0.377	0.721***	-0.049	0.081	-0.084
	(0.086)	(0.204)	(0.206)	(0.104)	(0.233)	(0.252)	(0.118)	(0.270)	(0.295)
Observations	493	493	273	493	493	229	493	493	235
Optimal h			12			9			10
Panel B: Impact of Gender on Health Outcomes									
Dep. Variable	Any prenatal visits			Non-premature births					
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR			
Female	0.001	0.008	0.014*	-0.001	0.012	0.011			
	(0.003)	(0.009)	(0.008)	(0.003)	(0.008)	(0.008)			
Observations	493	493	287	493	493	327			
Optimal h			13			16			
Panel C: Impact of Gender on Education Outcomes									
Dep. Variable	% of schools with library			% of schools with science lab			% of schools with internet		
Specification	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR	OLS	Spline polynomial	LLR
Female	0.012	-0.010	-0.071	0.005	-0.010	0.029	0.015	0.022	0.020
	(0.031)	(0.080)	(0.087)	(0.019)	(0.047)	(0.045)	(0.029)	(0.072)	(0.074)
Observations	493	493	254	493	493	289	493	493	283
Optimal h			11			13			13

Notes. This table shows results for OLS, RDD 3^{rd} order spline polynomial and local linear regressions with optimal bandwidth calculated as in Calonico, Cattaneo and Titiunik (2014). RDD specifications with split polynomial and local linear regression following equations 4 and 5 in the paper. h denotes the interval of our running variable. For instance h=10 represents mixed gender races where margin of victory is between -10% and 10%. Robust standard errors clustered at the municipality level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***. See Table 7 in the paper for the definition of the variables.

Table A6: Summary Statistics – Mixed Races vs Other Races

	(1) Other races	(2) obs	(3) Mixed races	(4) obs	(5) p-value
Municipal characteristics					
Population	24,733	10,068	12,339	723	0.000
Income per-capita (R$)	163	10,068	131	723	0.000
Literacy rate	0.558	10,068	0.502	723	0.000
Urban	0.589	10,068	0.554	723	0.000
Water supply	0.581	10,068	0.549	723	0.000
Electricity	0.870	10,068	0.839	723	0.000
Sewerage supply	0.229	10,068	0.170	723	0.000
Radio	0.211	10,068	0.109	723	0.000
Wage gap	0.134	10,068	0.101	723	0.000
Absenteeism	0.184	10,068	0.176	723	0.019
North	0.082	10,068	0.084	723	0.826
Northeast	0.314	10,068	0.487	723	0.000
Center	0.082	10,068	0.094	723	0.275
South	0.216	10,068	0.129	723	0.000
Southeast	0.306	10,068	0.206	723	0.000
Mayoral characteristics					
Term limit	0.288	10,068	0.318	723	0.082
Politician	0.098	10,068	0.113	723	0.209
Age	54	10,068	53	723	0.664
College	0.402	10,068	0.399	723	0.854
Higer education	0.847	10,068	0.840	723	0.609
Primary education	0.153	10,068	0.160	723	0.609
President coalition	0.271	10,068	0.248	723	0.174
Governor's coalition	0.199	10,068	0.202	723	0.856
Federal deputy's coalition	0.311	10,068	0.342	723	0.088
Estate deputy's coalition	0.280	10,068	0.298	723	0.293
PSDB	0.169	10,068	0.161	723	0.616
DEM	0.161	10,068	0.212	723	0.000
PMDB	0.208	10,068	0.224	723	0.295
PT	0.054	10,068	0.030	723	0.006
Outcomes					
Charges of corruption	0.757	2,053	0.820	161	0.071
Temporary public employees	194	5,027	128	381	0.000
Permanent public employees	552	5,027	340	381	0.000
Fraction of temporary public employees	0.250	5,027	0.254	381	0.556
Fraction of temporary public employees first year	0.255	5,012	0.253	381	0.881
Fraction of temporary public employees last year	0.245	5,017	0.250	381	0.665
Re-run	0.353	7,168	0.347	493	0.789
reelection	0.573	7,168	0.548	493	0.278
Non-discretionary transfers	11	10,068	13	723	0.042
Discretionary transfers	30	10,068	36	723	0.000
Total transfers	41	10,068	49	723	0.000
Non premature births	0.946	10,068	0.950	723	0.005
Any prenatal visits	0.975	10,068	0.974	723	0.553
% of schools with internet	0.284	10,068	0.238	723	0.000
% of schools with science lab	0.113	10,068	0.111	723	0.758
% of schools with library	0.437	10,068	0.378	723	0.000
N. of candidates	2.776	10,068	2.557	723	0.000
N. of candidates with at least higher education	1.406	10,068	1.250	723	0.000
N. of candidates with at least college	1.195	10,068	1.081	723	0.005

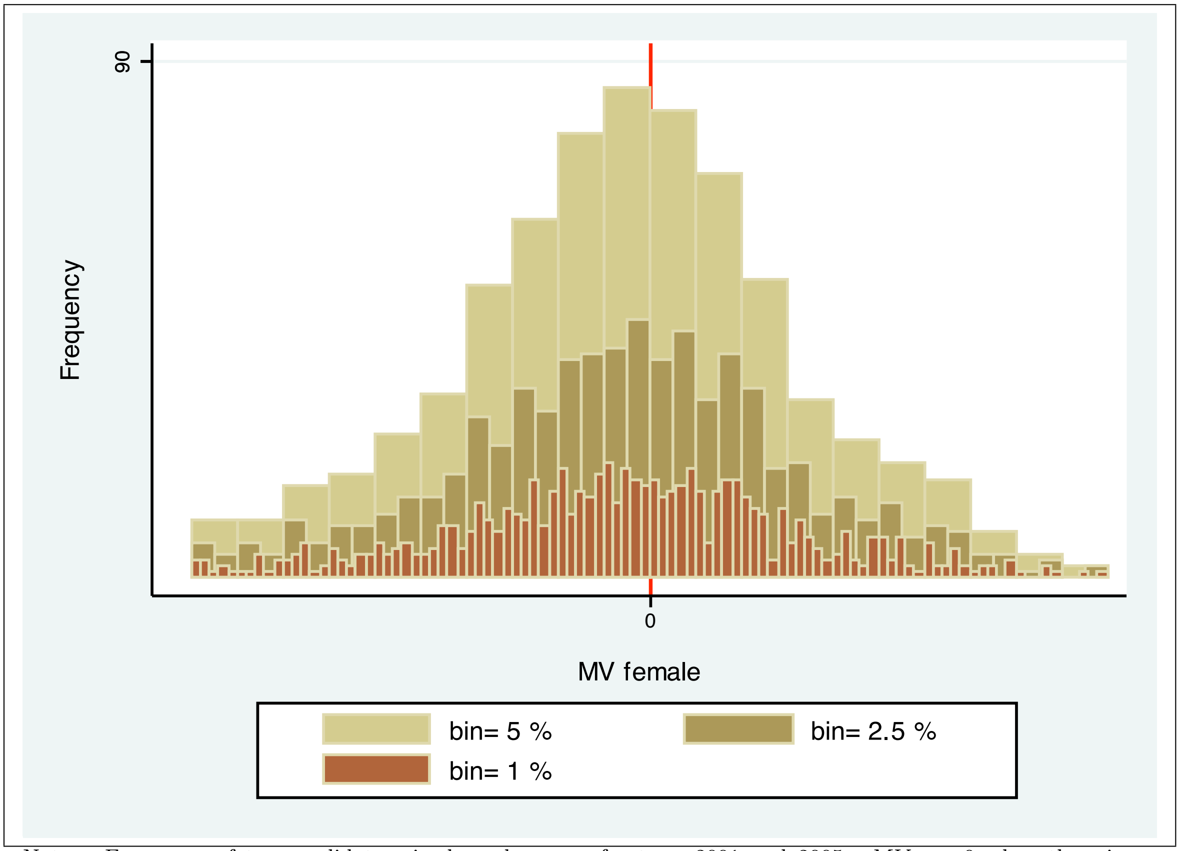
Notes. *Female mayor* considers the two-candidates mixed races sample where the winner candidate is woman and the loser candidate is a man. *Male mayor* considers the two-candidates mixed races sample where the winner candidate is a man and the loser candidate is a woman. Columns (1) and (3) report the average values in the respective samples; *obs* is the number of observations; *p-value* refers to the statistical significance of the difference between means. See Table 7 in the paper for the definition of the variables.

Table A7: T-test of the Outcomes in Close Elections with Different Intervals of the Margin of Victory of the Female Candidate: Female vs Male

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Outcomes	MV Interval [−5; +5]					MV Interval [−7.5; +7.5]					MV Interval [−10; +10]				
	Female	obs	Male	obs	p-value	Female	obs	Male	obs	p-value	Female	obs	Male	obs	p-value
Charges of corruption	0.687	17	0.909	22	0.086	0.642	28	0.900	30	0.019	0.676	35	0.875	40	0.039
Temporary public employees (log)	4.202	42	4.586	47	0.096	4.186	57	4.586	64	0.038	4.226	78	4.533	84	0.074
Permanent public employees (log)	5.589	42	5.485	47	0.480	5.573	57	5.510	64	0.603	5.603	78	5.535	84	0.520
Fraction temporary public employees	0.238	42	0.302	47	0.055	0.234	57	0.298	64	0.021	0.235	78	0.292	84	0.020
Fraction temporary pub. empl. first year	0.256	42	0.287	47	0.386	0.251	57	0.282	64	0.294	0.245	78	0.275	84	0.251
Fraction temporary pub. empl. last year	0.217	42	0.298	47	0.027	0.217	57	0.299	64	0.008	0.225	78	0.292	84	0.015
Campaign contributions (log)	9.739	30	10.378	32	0.094	9.957	44	10.399	47	0.128	9.991	56	10.361	65	0.137
Re-run	0.567	60	0.500	66	0.458	0.576	85	0.549	91	0.720	0.544	114	0.575	120	0.633
reelection	0.200	60	0.348	66	0.064	0.224	85	0.352	91	0.062	0.254	114	0.367	120	0.064
Non-discretionary transfers (log)	1.460	81	1.450	85	0.953	1.587	112	1.525	123	0.689	1.548	151	1.559	161	0.939
Discretionary transfers (log)	11.377	81	9.498	85	0.005	11.245	112	9.442	123	0.002	11.260	151	9.542	160	0.001
Total transfers (log)	11.886	81	11.167	85	0.149	11.938	112	11.206	123	0.076	12.032	151	11.240	160	0.030
Non premature births	0.954	81	0.947	85	0.279	0.955	112	0.949	123	0.222	0.955	151	0.949	161	0.173
Any prenatal visits	0.977	81	0.969	85	0.228	0.979	112	0.969	123	0.032	0.979	151	0.971	161	0.022
% of schools with internet	0.190	81	0.190	85	0.996	0.209	112	0.186	123	0.563	0.216	151	0.202	161	0.689
% of schools with science lab	0.097	81	0.083	85	0.619	0.093	112	0.074	123	0.374	0.101	151	0.092	161	0.705
% of schools with library	0.345	81	0.367	85	0.682	0.354	112	0.340	123	0.756	0.359	151	0.337	161	0.561
N. of candidates (log)	1.229	81	1.234	85	0.871	1.238	112	1.238	123	0.993	1.234	151	1.250	161	0.504
N. of candidates with higher education (log)	0.729	81	0.680	85	0.494	0.764	112	0.691	123	0.220	0.736	151	0.691	161	0.389
N. of candidates with college (log)	0.630	81	0.631	85	0.984	0.675	112	0.640	123	0.566	0.656	151	0.618	161	0.471

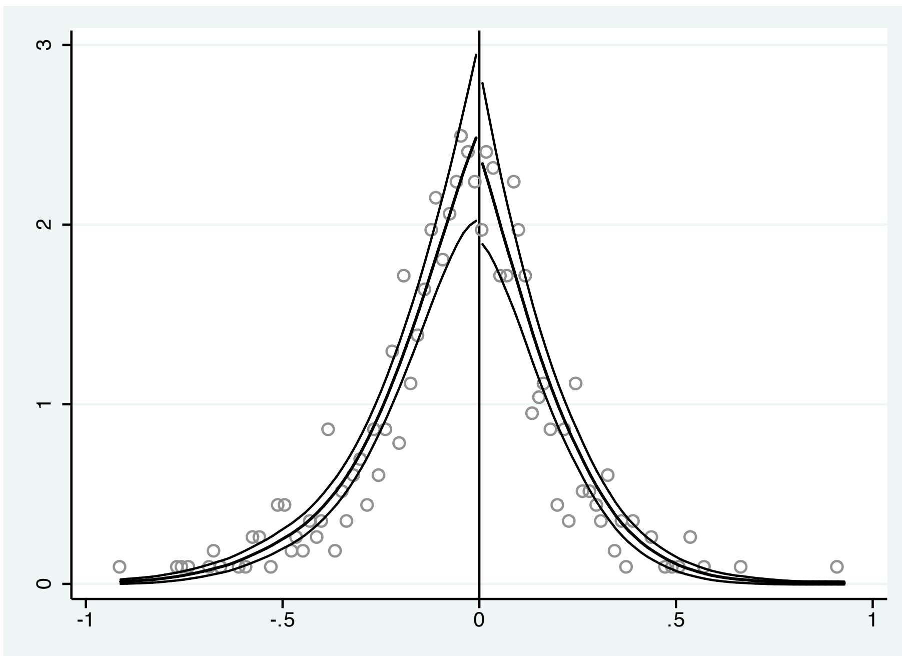
Notes. Mean-comparison tests for samples of municipalities with female mayors ($MV > 0$) vs male mayors ($MV < 0$). Three different intervals of Margin of Victory of the female candidate are considered in the two-candidates gender mixed races sample: $[-5; +5]$; $[-7.5; +7.5]$, and $[-10; +10]$. See Table 7 in the paper for the definition of the variables.

Figure A1: Frequency of Margin of Victory,
Two Candidates Mixed-Gender Races



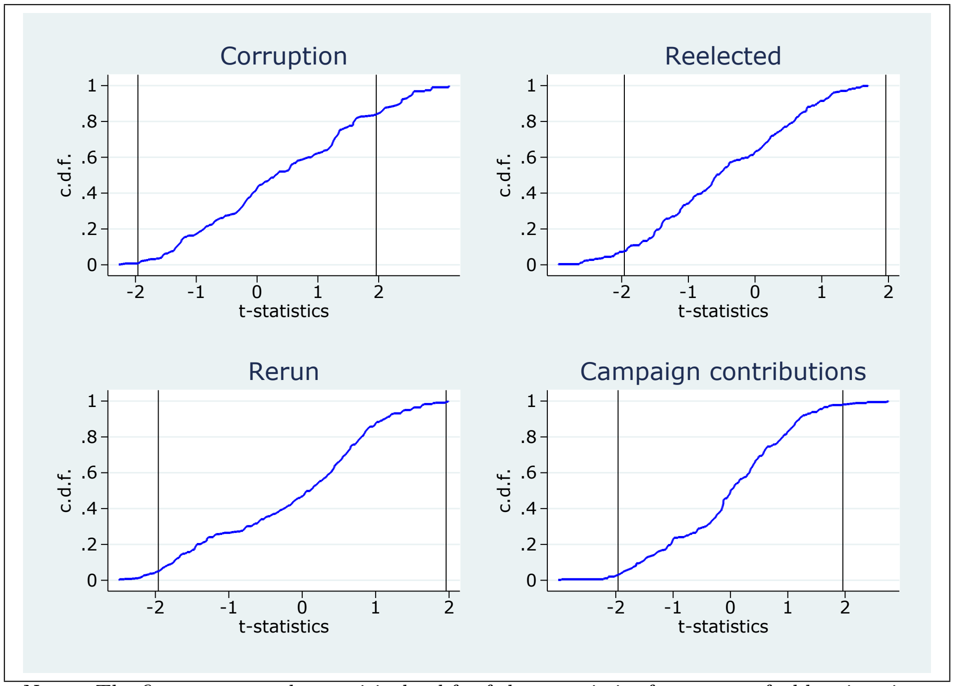
Notes. Frequency of two-candidate mixed gender races for term 2001 and 2005. $MV_{it} > 0$ when the winner candidate in the municipality i and mandate t is female, $MV_{it} < 0$ when the winner candidate in the municipality i and mandate t is male.

Figure A2: McCrary Test, Two Candidates
Mixed-Gender Races



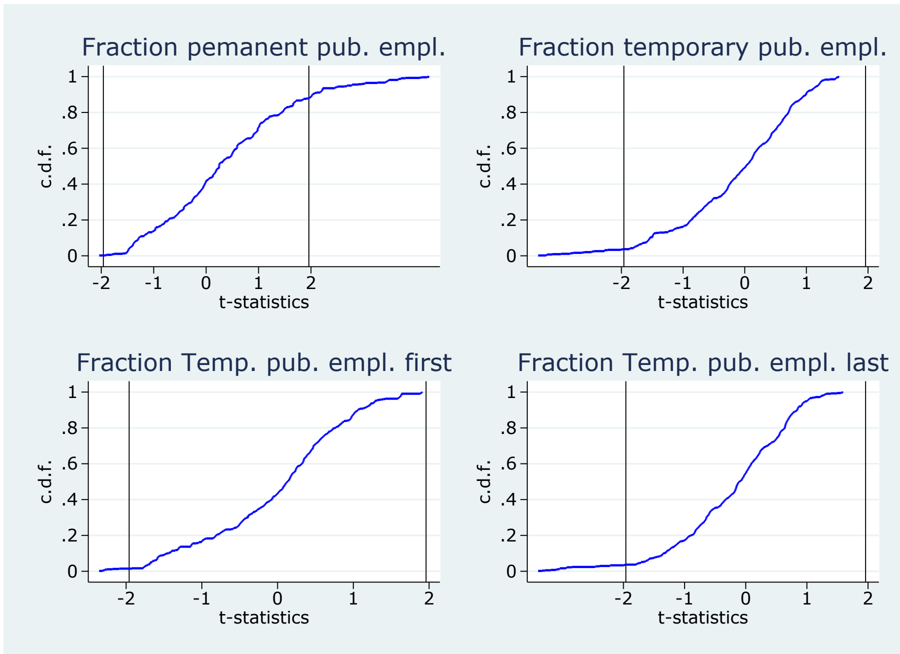
Notes. Weighted kernel estimation of the log density of our running variable (Margin of Victory of the female candidate) performed separately on either side of the zero Margin of Victory threshold. $MV_{it} > 0$ when the winner candidate in the municipality i and mandate t is female, $MV_{it} < 0$ when the winner candidate in the municipality i and mandate t is male. (discontinuity estimate: point estimate -0.049 and standard error (0.071)). Optimal bin-width and bin-size as in McCrary (2008). This sample considers races in 2000 and 2004 municipal elections.

Figure A3: Placebo Tests for
Corruption, Reelection Outcomes and Campaign Contributions



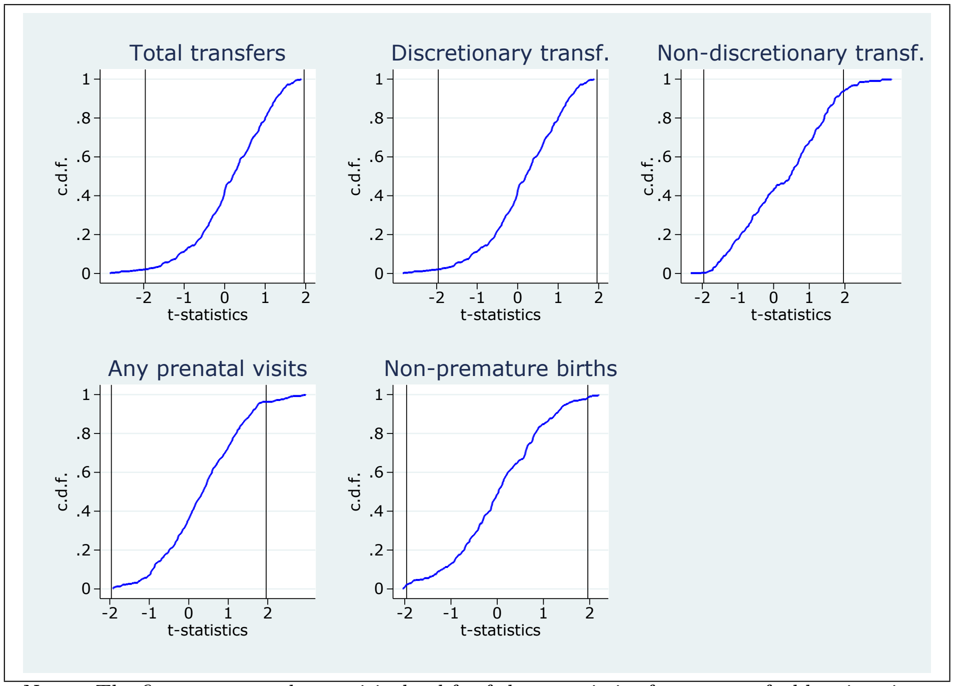
Notes. The figure reports the empirical c.d.f. of the t-statistics from a set of rdd estimations at 580 false thresholds below and above the true threshold at Margin of Victor of the female candidate equal zero (namely, t-statistics from regressions that consider margin of victory from -30% to -1% as fake cutoffs and t-statistics from regressions that consider margin of victory from 1% to 30% as fake cutoffs).

Figure A4: Placebo Tests for Municipal
Public Employment Outcomes



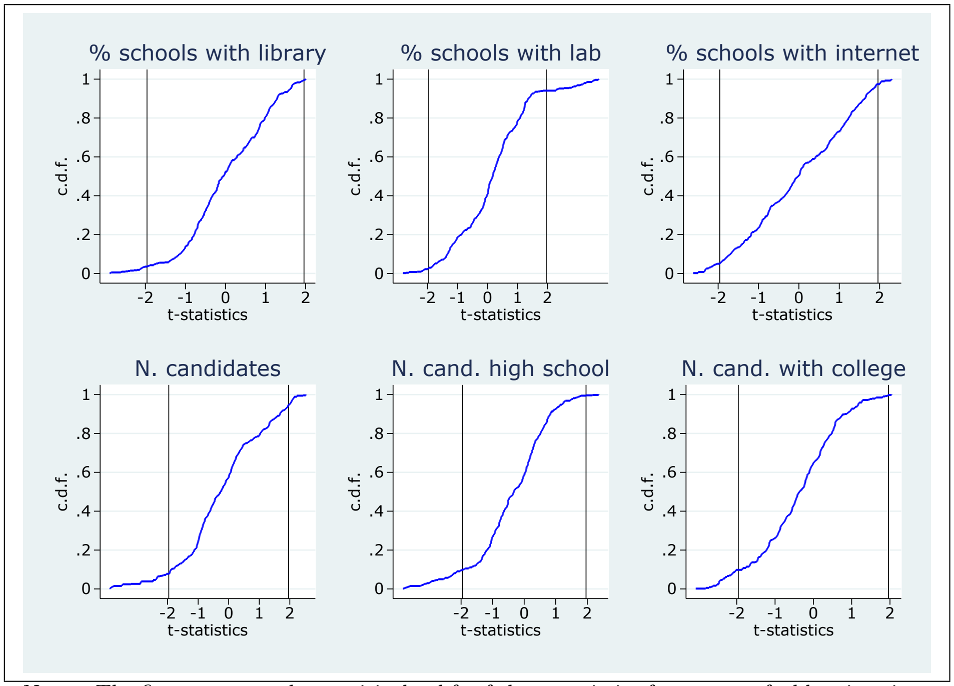
Notes. The figure reports the empirical c.d.f. of the t-statistics from a set of rdd estimations at 580 false thresholds below and above the true threshold at Margin of Victor of the female candidate equal zero (namely, t-statistics from regressions that consider margin of victory from -30% to -1% as fake cutoffs and t-statistics from regressions that consider margin of victory from 1% to 30% as fake cutoffs).

Figure A5: Placebo Tests for Transfers
for Capital Investments and Health Outcomes



Notes. The figure reports the empirical c.d.f. of the t-statistics from a set of rdd estimations at 580 false thresholds below and above the true threshold at Margin of Victor of the female candidate equal zero (namely, t-statistics from regressions that consider margin of victory from -30% to -1% as fake cutoffs and t-statistics from regressions that consider margin of victory from 1% to 30% as fake cutoffs).

Figure A6: Placebo Tests for Education
and Future Races Outcomes



Notes. The figure reports the empirical c.d.f. of the t-statistics from a set of rdd estimations at 580 false thresholds below and above the true threshold at Margin of Victor of the female candidate equal zero (namely, t-statistics from regressions that consider margin of victory from -30% to -1% as fake cutoffs and t-statistics from regressions that consider margin of victory from 1% to 30% as fake cutoffs).