Selling the Forest? Donor-funded Politicians and Deforestation

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Abstract

Democracy and election dynamics have an impact on natural resources, sometimes democratic elections have proved to help preserve natural ecosystems, but there is also evidence on the contrary. Despite the numerous studies on the direct effect of elections and democratisation little is said on the underlying factors that could drive the result to either direction; moreover, almost nothing is said about the role of campaign donations as a driver of deforestation, despite the evidence that these contributions play an important role on how the elected politicians behave. Using deforestation data from satellite images and information on campaign funding for the Colombian mayoral elections, we apply a regression discontinuity design and find that municipalities that elected a donor-funded politician exhibit much larger deforestation rates by the end of the government term.

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1 Introduction

Humanity is at risk. A changing climate poses an enormous threat to life and society. There is abundant evidence that as this phenomenon expands, critical aspects sustaining human life are in jeopardy; this includes, for example, our capacity to live and work in some environments and our food supply systems.[1] Deforestation is closely linked with global warming. Destruction of trees releases carbon dioxide into the atmosphere and decreases the earth's overall capacity to absorb carbon dioxide.[2] Forest capture up to 45% of the terrestrial carbon and seize large amounts of carbon dioxide. Since 1990, forests have absorbed about 33% of the total human-caused emissions of carbon dioxide, and they are a fundamental component of the hydrologic cycle, which helps to cool the planet (Bonan, 2008, Pan et al., 2011). However, despite the importance of these ecosystems, they are continuously deforested at alarming rates[3]. If we consider deforestation-related emission as a country, it would be the third-largest emitter, only behind China and the United States.[4]. Hence, stopping deforestation is a vital step in the fight against climate change.

Accurately understanding the sources of deforestation is crucial to be able to stop it. Current research links activities as cattle ranching, farming, logging and urbanisation as the leading causes of deforestation (Curtis et al., 2018, Houghton, 2012, Hosonuma et al., 2012). However, little is know about the underlying drivers allowing and intensifying activities that lead to deforestation. Understanding how certain events impact the rise and persistence of deforestation allows better decision making and more suitable policy design (see, for example, Prem et al., 2020). Politics is a natural field of interest in this regard. Even if not directly linked to deforestation, political outcomes have an inherent potential to shift deforestation dynamics.

This paper studies the effect of private campaign donations on deforestation. More precisely, we investigate the changes in deforestation dynamics in Colombian municipalities following the election of a donor-funded mayor during the mayoral incumbency period (2012-2015). We take advantage of the presence of both politicians who receive contributions from private donors and politicians that self-funded their mayoral campaigns to compare the deforestation trends using a

[1] See for example Woetzel et al. (2020)

[2] See https://www.nationalgeographic.com/environment/article/deforestation. Last accessed on April 2021

[3] For example,according to Crowther et al. (2015), since the onset of human civilisation, over 45% of the world's trees have fallen, many of them in recent times, with a gross loss surpassing 15 billion trees each year.

[4] According to World Resources Institute. Please refer to https://www.wri.org/insights/numbers-value-tropical-forests-climate-change-equation. Last accessed on April 2021

regression discontinuity design (RDD). Hence, we estimate the effect on deforestation of electing a donor-funded mayor vis-à-vis electing a self-funded mayor. With this paper, we contribute to the literature by discussing the impact of money in politics on deforestation dynamics. Expressly, we address the questions: 1) Do the election of a donor-funded politician induce an increase in deforestation? 2) If so, which factors seem to influence this result?

Literature shows that elections dynamics affect deforestation in several ways. The mere existence of elections impacts deforestation. Li and Reuveny (2006) documented that democracy reduces deforestation. Meanwhile, Morjaria (2012) observed that preceding the introduction of multi-party elections in Kenya, deforestation increased alongside a change in land use. Furthermore, Sanford (2018) laid out a hypothesis on how competitive elections increase deforestation as politicians facing a competitive election offer voters access to forested areas, this mainly focusing on a reelection setting. Using remote sensing techniques to track deforestation and information of more than 500 national-level elections between 1975 and 2005, he found that democratic rules are a catalyst of deforestation. Moreover, close elections had 25% higher deforestation rates than those elections won by a wide margin. Besides, there is evidence that local elections affect deforestation; Burgess et al. (2012) found that illegal logging increased before local elections in Indonesia.

Additionally, corruption networks' existence is relevant, as the election of a corrupt politician may have devastating effects on deforestation, as Pailler (2016) showed for Brazil. Literature on political connections further supports his idea. There is evidence showing that privates may benefit from nexus with politicians (Khwaja and Mian (2005), Bertrand et al. (2014), González and Prem (2018)) and that politicians may allocate State resources, as land, to companies close to them (Schoenherr (2019), Akey (2015)).

Furthermore, there is broad literature showing that money plays an essential role in determining election outcomes and politics in general (see for example, Avis et al. (2017), Christiano (2012), Bowler and Donovan (2016)). The flourishing and continuous growth of lobbying is the best example of this. For instance, in the United States, lobby spending has consistently surpassed a trillion US dollars per year throughout the last decade.[5] Moreover, this expending concentrates on few groups of interest. Top groups of interest are relatively constant, and on an average year, the four top-ranked sectors account for 60% of the total expending. Lobby spending in the US has proven to pay

[5] According to Open Secrets. Please refer to https://www.opensecrets.org/federal-lobbying/ranked-sectors?cycle=a. Last accessed April 2021

off, particularly for the most prominent lobbyists, the healthcare sector (see, for example, Landers and Sehgal (2004)). Given the potential disruptive power of money in politics, it is reasonable to question if the natural environment is at stake when money enters politics.

When studying money in politics, campaign's donations is an attractive place to start. Campaign donations are possibly the most straight forward money connection between private parties and politicians and a widespread phenomenon [6]. Moreover, theoretical literature has long hypothesised that donor-funded politicians could grant favours in exchange for donations. Snyder (1990) shows that camping donations from groups of interest and political favours can be seen as a simple asset market. He shows a stable equilibrium among the total amount of contributions a candidate receives, the value of the favours the candidate promise, and the probability of victory. Furthermore, he validates the model empirically using data for the US House of Representatives open-seat races between 1980 and 1986. Other formal theory literature also may support such an idea (eg. Baye et al. (1993), Ainsworth and Sened (1993), Austen-Smith and Wright (1994)). In particular, the Austen-Smith (1987) model shows that candidates can acknowledge that policy choices affect contributions and adjust their policies to collect them, and later use contributions to change voters' perceptions even if the policies do not align with the voters.

Linking camping donations and deforestation more closely, Bulte et al. (2007) found that Latin-American farmers bribe local politicians with contributions to obtain subsidies. Pailler (2018) shows deforestation in the Brazilian Amazon increases before elections and that self-funded politician seeking reelection allows for higher deforestation on election years. Moreover, some networks and greater competition may worsen deforestation. For example, Klopp (2012) shows that, in Kenya, more competitive elections produced stress over the existing patronage networks raising incentives for high-level state actors to obtain control over land and leverage this to gain support fund campaigns.

Our results show that deforestation almost doubles in municipalities that elected a donor-funded politician compared to the municipalities where a self-funded politician secured the victory by a small margin. Being, deforestation is considerably higher for the last year of government. A higher provision of infrastructure could explain, at least partially, the surge in deforestation at the end of the term. However, the differential in deforestation between municipalities with donor-funded

[6] According to IDEA interational intitute, over 99% of the countries allow for campaing donations. See Falguera et al. (2014)

mayors and self-funded is not plausibly explained by a traceable direct action of the mayor for the first two years of government.

We explore potential heterogeneous effects using pre-term municipal characteristics to help us to shed light on the underlying factors driving the result. We use measures of higher state presence in the form of the extent of protected national parks (which are subject to higher monitoring than most forest areas), alongside the presence and distance to the offices of the control organism for natural resources. [7] The results lead us to conclude that tighter institutional oversight reduces the deforestation linked to the donor-funded politician victory. We also find that the history of conflict and the presence of armed actors affect the deforestation dynamics linked to the election of a private-money backed politician. We find that the presence of conflict between armed actors reduces the deforestation linked to the election. However, when considering the attacks of the main illegal actors, Paramilliarys and Guerillas, we find that while Guerillas attacks substantially lower the deforestation related to the donor-funded politician victory, Paramilitary groups attacks do not modify the deforestation trends.

The results are consistent with an interpretation in which donor-funded mayors execute a more ambitious infrastructure provision plan and point to one in which elites' behaviour changes when the mayor is a donor-funded politician. As further explained in section 2, Colombia's local elites has a long history of land appropriation and illegal expansion of the agricultural frontier. Campaign donations may create a connection between the elites, and the ruling mayor, which may provide a sense of protection when engaging in deforestation activities. This seems reasonable as the effect is attenuated with the oversight of other state institutions [8] and violence from armed groups that historically have undermined the power of the local elites.

The remainder of the paper is organised as follows: Section 2 details the Colombian context concerning deforestation, the role of donations in local elections, and some meaningful information on the institutional background. Section 3 briefs on the sources of data and transformations. Section 4 develops on the employed empirical strategy. Section 5 presents the main results. Section 6 expands on the possible mechanisms driving the results. Finally, 7 closes with some final remarks.

[7] In Colombia the control organism is constituted by the Autonomous Regional Corporations or CARs (by its Spanish acronym). This is further explain in the context section (2) of the paper.

[8] Barbier et al. (2005) show that state institutionality diminishes resources exploitation liked to corruption.

2 Context

Deforestation in Colombia. Colombia is the guardian of about 10% of the Amazon rainforest. Furthermore, by 2010, natural forest covered an impressive 67% of the country's total surface Global Forest Watch (2019). It ranked third in South America as the most extensive forest-covered, only behind Brazil and Peru FAO (2015). Nonetheless, deforestation has been an increasing problem. From 2001 to 2018, the country lost more than 4 million hectares of tree cover, half of which was lost between 2011 and 2018. Global Forest Watch (2019).

As in most Latin America, the most notorious driver of deforestation in the nation is cattle ranching (FAO, 2006). Colombia has a long history of cattle production, being the fourth largest cattle breeder in the region and the seventh worldwide (PROEXPORT, 2010). Furthermore, the massive peak in beef demand will most likely boost further expansion. Still, other usual drivers also play a part. Nowadays, logging and mining have also had an impact and have steady growth, being much of it illegal.

Interestingly, the shifting political environment in the country has had a surprising effect on deforestation dynamics. After the cease-fire between the Colombian government and the country's biggest illegal armed group, the FARC, deforestation rose in areas previously controlled by the violent group, being the impact exacerbated by land-intensive economic activities and poor state presence (Prem et al., 2020). Likewise, there is evidence of an increase in illegal coca production directly linked to the government policies in the peace accord frame (Prem et al. (2021)), which resulted in higher deforestation.

Colombian Local Elections. The local current local elections in Colombia result from a long history of economic and political decentralisation policies. Colombia's first municipal elections took place in 1986. Before that, mayors were appointed by the department's governor, which was himself appointed by the president. The initial government term was of only two years, but it has increased through time and is now set to four years. [9]

In Colombia, local campaigns are not cheap. For the 2015 Mayor election, the campaign's incomes total more than 238 billion pesos (about 82 million US dollar at the time); this amount represents an impressive 71% of the whole nation's science and technology budget (MOE (2018.)).

[9] see https://www.registraduria.gov.co/Se-cumplen-25-anos-de-la-primera.html. Last accessed April 2021

Nonetheless, according to MOE (2018.), the number of public resources available for local elections are scarce, being the campaigns primarily financed by personal or familiar resources and private donations. Furthermore, campaigns can be pretty competitive (without immediate re-election), and a strong correlation between campaign spending and the probability of becoming elected. Consequently, candidates have strong incentives to secure private contributions.

The country has a detailed law that sets the rules for private donations, introducing limits on the total and individual contributions. The maximum personal contribution is limited to 10% of the sum of contributions. Meanwhile, the total amount is bounded according to the limit set for each election by the National Electoral Commission, with discontinuous jumps based on the number of registered voters. Nevertheless, the extent to which the law is fulfilled is somewhat debatable.

There is strong evidence associating campaign donations and acts of corruption. Ruiz (2017) identified a donor premium, being campaign donors up to 13 times more likely to obtain state contracts. The risk linked to campaign donations is such that the National Constitutional Court raised awareness on the topic due to the corruption scandals and the increasing participation of large amounts of money in campaigns.[10]

Vigilance and control. In Colombia, the Autonomous Regional Corporations or CAR (by its Spanish acronym), instead of the mayors directly, are the entities in charge of administrating the nation's natural resources and natural environment, contrary to other countries as Brazil. Among the CAR duties and responsibilities within their jurisdiction are [11]: Conduct any environmental program, serve as the maximum authority in environmental-related issues, grant any required environmental concessions, permits or licences, set the permissible limits of emissions, discharge, transport or deposit of any material that harms the environment or renewable natural resources; exercise the functions of environmental evaluation, control and monitoring of the activities of exploration, exploitation, benefit, transport, use and deposit of non-renewable natural resources; and exercise the functions of environmental evaluation, control and monitoring of the uses of water, soil, air and other renewable natural resources.

As their name indicates, the CARs are autonomous entities. They are independent of the Environmental Ministry, the Governors or the President. The institution's senior management is a

[10] Sentence C-1153 of 2005

[11] The comprehensive list of responsibilities is consigned in Law 99 of 1993, article 24.

Managing Board composed of representatives from the central government, the state governments, some Mayors, ONGs, and delegates from ethnic communities.

Despite the CARs jurisdiction over the nations natural resources, their oversight over resources is often insufficient (see Montes Cortés (2018)). Hence, other government actors often play a significant role in protecting the forest. The national government throughout the National Ministry of Environment, the National Department of Planning (DNP per its Spanish acronym) and the army have often played an essential role in protecting Colombia's natural habitat. Moreover, local governments often play a crucial role in stopping deforestation activities in their early stages.[12]

The mayor is the foremost policing authority of the municipality. Within his responsibilities, he must procure for the rule of law and fulfil the law and decrees from the National and Departmental government.[13] Moreover, they have control over the municipal budget and overall faculty to guide the municipalities priorities and discussion in the local assembly. These characteristics make mayors fundamental in protecting forests, more so in the early stages of deforestation. Good examples of the role of mayors come from the series of alliances signed to stop deforestation; the most notorious, the one sign between the Colombian and Brazilian mayors to protect the Amazon rain-forest [14] and the broad pact against deforestation, established in 2016.[15] Besides, control entities have recalled the mayor's duty to procure public services as equipped fire departments to stop forest fires from expanding.[16]

Land and violence. Colombian local elites are closely tight to the land. Since colonial times, the landlords have steadily increased their land ownership and consolidated their power through it (see Fernandez (2012), LeGrand (1988)).

Land property rights in Colombia have been a long-lasting problem, with an extensive history of concentration of land in few hands. Despite some efforts, the democratisation of land has never been achieved. Moreover, the institutional efforts to change the unequal distribution of land have been

[12] see, for example, http://es.presidencia.gov.co/noticia/170822-Gobierno-Nacional-refuerza-medidas-para-contrarrestar-la-deforestacion. Last accessed April 2021

[13] For example the sentence 4360 of 2018, clearly involved mayors on the plan of early actions against deforestation.

[14] See https://cda.gov.co/es/noticias/encuentro-de-gobernadores-y-alcaldes-brasil-colombia-estado-de-acre-y-region-amazonica-colombiana-por-una-amazonia-libre-de. Last accessed April, 2021

[15] See https://www.minambiente.gov.co/index.php/noticias-minambiente/3451-alcaldes-de-colombia-ratifican-compromiso-en-lucha-contra-la-deforestacion. Last accessed April, 2021

[16] See https://www.procuraduria.gov.co/portal/Procuradora-apropiacion-recursos-servicio-bomberos.news. Last accessed on April 2021

instrumentalised by the elites to appropriate large land extensions. (see, Ibañez and Muñoz-Mora (2010)). Furthermore, violent periods as 'La Violencia' at the end of the 1940s have resulted in massive forced displacement and violent land expropriation (see, Guzmán et al. (2010), Fernandez (2012)).

The land concentration is, in fact, in the heart of the countries lasting presence of illegal armed actors. At its beginnings, Guerilla groups, as the Revolutionary Armed Forces of Colombia (FARC), claim that they were fighting to protect impoverished rural people and presented themselves as enemies of the local elites. Due to the rise of these groups, law 48 of 1968 went into action, allowing the creation of large private security forces used by large landowners and cattle ranchers. These private armies later became far-right paramilitary groups.[17]

3 Data

We combine data from various sources and build a municipality-candidate level dataset to study the effect of a donor-funded politician victory on deforestation. We focus on the 2011 mayoral election results and the government term from 2012 to 2015. In this section, we further explain our data sources and overall data structure and transformations.

Electoral Results and Donations Our electoral and campaign contributions data comes from Ruiz (2017). This dataset contains detailed data on both election results and campaign contributions received by candidates. The electoral information in the dataset originally comes from Pachón and Sánchez (2014), who gathered the results for mayoral elections for all Colombian municipalities reported by the Registraduría Nacional del Estado Civil, the Colombian electoral authority. Meanwhile, the campaign contributions data was collected by Ruiz from the numbers reported by the National Electoral Commission on the sources of income and campaign expenditures.

As shown by Ruiz (2017), this data is highly reliable, with low incentives to misreport or lie. Up two months after elections, political parties were obliged to electronically submit the information on the sources and expending related to political campaigns and, later, in a swift manner, provide physical evidence corroborating the previously reported data. Moreover, during the 2011 elections,

[17] Insight Crime further connects elites and armed groups, and how they were instrumentalised to gain power and land. See https://es.insightcrime.org/investigaciones/elites-crimen-organizado-colombia-introduccion/. Last accessed April 2021

the Electoral Commission had the power to penalise candidates with fines, which led to high compliance, with 89% of the information of the campaigns reported (Ruiz (2017)). Nonetheless, the commission was stripped of this faculty in 2012, limiting the information delivery compliance for the 2015 electoral period. Due to the absence of effective enforcement for 2015, we focus on the 2011 elections.

Out of the 1080 municipalities that elected mayors in 2011, our sample is restricted to the 996 municipalities where the top two candidates reported their campaign financing. This data structure allows us to implement the RDD around the margin of victory of the candidates. As our interest really on the comparison between donor-funded and self-funded mayors, we focus on the 408 races decided between a candidate who was a recipient of private donations and a competitor who did not. These races are representative; they spread across the country's territory and, the municipalities do not present statistically different characteristics compared to those excluded.[18]

Deforestation. Our measurement of deforestation comes from the Global Forest Change dataset collected by Hansen et al. (2013). This data results from the analysis of LANDSAT's images to identify the forest cover and its change from 2000 to 2020, taking advantage of remote-sensing techniques. The data comprises pixels of 30 meters by 30 meters (approximately). The use of these data has been broadly used in literature to measure the change in tree cover and see, for example, Prem et al. (2020).

Tree cover is defined as vegetation taller than 5 meters and is encoded as a percentage per output grid cell. We adopt a definition that considers any pixel with a tree cover superior to 50% of its surface as forest. Hence, deforestation is a pixel change from the status of forest to non-forest. This data is aggregated to the municipal level. Our primary deforestation variable is defined as the negative of the change in forest area in the municipality during the mayor's term relative to the municipality tree cover in the year before the new mayor's mandate. The deforestation measure follows:

$$\text{(Relative) Deforestation in term} = \frac{-\Delta Coverage_{\text{government term}}}{Coverage_{\text{election year}}} \tag{1}$$

[18] Ruiz (2017) shows the contested municipalities are not regionally clustered and instead follow a random geographical distribution.

We calculate the deforestation measure for the 2011 election (2012-2015 government term) and the previous election, the 2007 election (2008-2011 government term). Furthermore, we also calculate an alternative version of the deforestation measure relative to the year 2000.[19] Figure 1 shows that deforestation was a broad phenomenon across the country during the studied period. Moreover, deforestation was rapidly consuming the country's tree cover. As displays, the table 1, the 1080 municipalities that elected a mayor in 2011 lost on average almost 1.2% of their tree-covered area during the 2012-2015 government period.

Additional data-sets. For additional exercises, we employ several data sources. We gathered data from NASA's Fire Information for Resource Management System (FIRMS) to track fires during the study time.[20] Additionally, we used detailed data on contracting. Contracts data comes from the SECOP system, which collects information in all government contracts and is available online to increase transparency.[21] We also take advantage from the violent events data collected by Restrepo et al. (2004) and updated by Universidad del Rosario until 2014.

Alongside the after-mentioned data, we use a set of municipal level covariates. Our primary source for this is the data collected by Universidad de Los Andes and their Center For Economic Development Studies.[22] This dataset contains a broad array of socio-economic variables, including fiscal performance, demographic and geographical measures.

4 Empirical Strategy

We are interested in testing whether municipalities with elected donor-funded mayors have higher (lower) deforestation than those lead by a self-funded mayor. The victory of a donor-funded candidate is plausibly correlated with a broad range of municipal characteristics. Moreover, the studied outcome, deforestation, may be determined by several additional municipality characteristics. For example, larger municipalities are likely to have more resources and a higher economic activity leading to higher deforestation. Due to these identification problems, a straightforward comparison of

[19] The main results are robust to this change in the relative year and are available upon request.

[20] We acknowledge the use of data and/or imagery from NASA's Fire Information for Resource Management System (FIRMS) (`https://earthdata.nasa.gov/firms`), part of NASA's Earth Observing System Data and Information System (EOSDIS).

[21] This data was provided by Nelson Ruiz.

[22] Please refer to Acevedo and Bornacelly (2014)

deforestation across municipalities with elected donor-funded mayors and those with a self-funded mayor may confound the effect of different local characteristics.

To overcome the problems arising from other potential explanations, we employ a quasi-experimental design. Our identification strategy implements a Regression Discontinuity Design (RDD). An RDD has three main components, a running variable, a cutoff and a treatment rule. Following the treatment rule, a unit is treated if the running variable's value exceeds the cutoff and control otherwise. Consequently, by design, the treatment status changes abruptly at the cutoff. Hence, taking advantage of the discontinuous change between a donor-funded and non-donor-funded mayor at the threshold between the donor-funded politician's victory or loss. The treatment rule follows:

$$L_i = \begin{cases} L_i = 1 & \text{if } x_i > 0 \\ L_i = 0 & \text{if } x_i < 0 \end{cases} \tag{2}$$

Furthermore, our analysis follows a regression of the form:

$$y_i = \alpha + \beta_1 L_i + \beta_2 f(x_i) + \beta_3 L_i \times f(x_i) + \varepsilon_i \tag{3}$$

Here y_i is the outcome, hence the deforestation measure during the term in office of the elected mayor, meanwhile L_i is a dummy variable taking the value of one (1) if a donor-funded politician was elected (i.e. won the race), being β_1 our coefficient of interest. $f(x_i)$ is a polynomial, either linear or quadratic, in the donor-funded politician margin of victory, our forcing variable. Finally, ε_i corresponds to the idiosyncratic error term. As this regression follows a Regression Discontinuity Design (RDD), we limit our sample to the races where a donor-funded politician was either elected or came second.

Notice that by employing this method, we are not estimating the effect of donations themselves but rather the effect of the type of politician being donor-funded. To correctly estimate the coefficient of interest β_1, which captures the change on deforestation, either increase or reduction, linked to the presence of a donor-funded politician, several assumptions are made. First, all covariates, but the treatment variable, must vary smoothly around the threshold, being the discontinuous change on deforestation exclusively related to the candidate's source of funding. Second, there should not

be manipulation of the electoral results around the cutoff; in other words, it should not be the case that donor-funded politicians constantly win by a small margin.

We test for the identifying assumptions. First, we check for the hypothesis of no systematic manipulation of the electoral results around the threshold. We take advantage of the Cattaneo et al. (2018) manipulation test based on density discontinuity, [23] this is presented in figure 2. We found no statistically significant evidence of systematic manipulation. Second, we test that other covariates shift smoothly around the threshold; this is presented in the table A1. We found that, in general, the assumption is met.

Following best practice (see, Cattaneo et al. (2020)), we estimate RDD in equation 3 non-parametrically using polynomial of order one (1) [24] and weighting observation according to their distance to the cutoff using triangular weights. Additionally, we employ an optimal data-driven bandwidth selection procedure that minimises the asymptotic mean square error (MSE). This method allows selecting a bandwidth that accounts for the trade-off between efficiency and bias. In other words, the technique minimising MSE archives bandwidth large enough to avoid imprecise estimates due to a small sample, but also a bandwidth small enough to guarantees that municipalities around the cutoff are comparable, without discontinuous variation on their characteristics at the cutoff (Lee and Lemieux (2010)). Nonetheless, MSE bandwidths produce non-robust confidence intervals. Therefore, following Cattaneo et al. (2020), we estimate robust standard errors and intervals but report conventional point estimates within the MSE optimal bandwidth.

Finally, as previously mentioned, we focus on the Mayoral term of 2012-2015 due to two reasons: First, the electoral funding report system was set in place in 2009; therefore, only the elections since the election of 2011 have this data. Second, the 2011 election was the only one with a credible punishment in case of fraud or absence of reporting. Without fines, the confidence in the enforcement for the 2015 elections is undermined. [25]

[23] Similar results are found using the McCrary (2008) test for sorting around the threshold.

[24] The appendix presents the paper results using quadratic polynomial.

[25] After analysing the 2015 funding data, we found evidence of manipulation. We speculate that this is due to significant under-reporting from non-winning candidates.

5 Results

Figure 3 graphically presents the central result. From left to right, the first graph depicts the estimates for a linear polynomial approximation, and the second using a quadratic polynomial. We find a discontinuous jump in deforestation during the term in office around the threshold of victory determining a donor-funded mayor. Moreover, the jump is statistically significant for both the linear and quadratic approach.

Table 2 summarises the impact in greater detail. As previously stated, our coefficient of interest displays the additional effect in deforestation of electing a donor-funded mayor compared to a self-funded one. In Columns 2 and 4, we include as a covariate the measure of deforestation for the previous term, 2008-2011. Even if all covariates switch smoothly around the cutoff, we employ it as a robustness check and improve the estimates' precision (Lee and Lemieux (2010)).

Estimates are positive and significant across specifications. The results are robust to selecting a linear or quadratic polynomial and the inclusion of the previous deforestation as a covariate. Overall, the effect of electing a donor-funded politician is comparatively sizeable. The increased deforestation related to a donor-funded mayor's election represents around 91.7% of the self-funded average for the linear specification. The effect size remains somewhat stable and significant across specifications, ranging between 58.3% and 108.3% of the self-funded average.

Complementing the result, table 3 depicts how deforestation varies across each year of the government term. Interestingly, the effect is present in all years of government, but the third and intensifies during the last year of government.[26] When comparing with the municipalities ruled by self-funded mayors, the difference is notable. For the first two years of government, the municipalities' deforestation with a newly elected donor-funded mayor is about 92.4% higher vis-a-vis the municipalities with self-funded mayors. For the last year, it is 107.7% higher. Similar results hold if we use a quadratic polynomial (appendix table A2). The abrupt increase in deforestation in the last year of government is consistent with the existing literature on deforestation and elections. However, this literature often relies on reelection settings, which is not the case for Colombia.

[26] Interestingly, when implementing a non-parametric differences-in-differences for all 408 municipalities with race between donor and non-donor top candidates, we also find a large and significant increase in deforestation for the last year of the term, despite not finding effects for the previous years. Although a upward trend in deforestation is present. The results are summarised on the figure A4

Finally, in figure 4, we explore the resilience of the results to a bandwidth change. Following best practice, we report the results around the MSE optimal bandwidth, from half to double the bandwidth. The overall results are encouraging. We find that the result hold for a considerable range of bandwidths. Given our small sample, for most RD standards, it is no surprise that the results do not hold for very small bandwidths, as we likely do not have enough power at this point. However, the effect holds quite desirably up to bandwidths of 0.08, where the races are far less competitive and the municipalities not as comparable.

6 Mechanisms

So far, we have documented a substantial increase in deforestation in municipalities ruled by a donor-funded mayor. As previously mentioned, we find that the sampled municipalities are heavily comparable, without statistically significant differences in their characteristics nor deforestation trends before the election. These results lead us to believe that the differential increase in deforestation is due to a donor-funded politician' victory — however, the question of how the rule of donor-funded mayor results in more extensive deforestation prevails.

To further understand the main result, this section presents additional exercises aiming to disentangle the relationship between donor-funded politicians and deforestation. Moreover, it provides further evidence in support of our preferred interpretation.

We hypothesise that the increase in deforestation is driven by more intensive land exploitation fuelled by a perceived lower risk of punishment accompanied by a rise in municipal contracting. The interpretation is consistent with the country's context, where the mayors' command over the municipalities natural resources is legally limited. Candidates face competitive elections, with overall expensive campaigns with almost no state funding and a history of corruption and abuse of the municipalities resources by elected officials (see, Ruiz (2017), Martinez (2019)).

Contracts. Despite their limited capacity to control natural resources, mayors influence decisions that heavily affect the natural environment. In particular, mayors play an essential role in contracting. Through contracting, mayors may execute infrastructure projects, engage in mining activities or provide further environmental protection or restoration. We check if donor-funded mayors exhibit a differential behaviour regarding contracts that may explain the increase in deforestation

related to their election.

As one of the largest state-related sources of deforestation is building infrastructure, we start by testing if there is a differential increase in the number and the average value of infrastructure contracts. Table 4 present our results. Donor-funded mayors do not seem to be taking on more infrastructure projects, but they seem to be increasing their average value. The increase in the value could be indicative of more ambitious infrastructure projects. However, a differential of 22% with respect to the mean on the average value of contracting seems insufficient to justify the almost twofold increase of deforestation in these municipalities.

To further understand the role of infrastructure contracting, we analyse the average value of infrastructure contracting by a donor-funded politician by year of government (table 5). The results show that the increase in value only takes place in the third year of government. Therefore, even if the surge in value effectively translates into more ambitious infrastructure, this would only explain an increase in deforestation after the third year of administration. Furthermore, as shown in table 3 the third year does not present a statistically significant difference in the deforestation dynamics. These led us to believe that the effects of the higher value of infrastructure contracts in donor-funded municipalities only serves to explain, at least partially, the increase in deforestation in the last year of government but does not allow to disentangle the overall effect.

Similarly, we test for differences in mining contracts (Table 4). Mining is an important catalyst of deforestation. If donor-funded mayors are more prompt to engage in activities related to mining, this could potentially explain the differential in deforestation in their municipalities. However, as shown in column 3 and 4 of table 4, we do not find any difference between self and donor-funded mayors' contracting.

Finally, we test for a difference in environmental contracts (Table 4). If self-funded mayors are more lenient to protect the environment, that may explain our results. That does not seem to be the case. Self-funded and donor-funded mayors are evenly engaging in environmental-related contracts (table 4).

The role of state presence. Literature regarding both corruption and deforestation often finds that vigilance and control are essential to fight them (see, Bonilla-Mejía and Higuera-Mendieta (2019), Prem et al. (2020), Prem et al. (2021)). Therefore, we investigate how additional vigilance

and control may affect our result.

In Colombia, National Parks are protected forest areas subject to more intense vigilance than most. Moreover, the National Government carries the design and execution of these areas' monitoring mechanism, leaving little room for local officials to interfere. Column 1 of table 6 interacts the dummy of a donor-funded victory with the National Parks' area in the municipality. We find a negative and statistically significant interaction estimate. This effect is consistent with our interpretation, as it indicates that an increased area of tighter vigilance reduces the additional deforestation linked to a donor-funded mayor.

As a second test of the effects of vigilance, we study how CAR's oversight influence the overall effect. Table 6 shows the heterogeneous effect of a donor-funded mayor by CAR's presence and distance. Once again, the results support our hypothesis. The presence of CAR offices diminishes the effect of a donor-funded victory. Meanwhile, the greater the distance to the offices greater the deforestation when a donor-funded politician is elected.

The role of violence. The ultimate winners of the increased deforestation in our preferred interpretation would be landowners and cattle ranchers, who exploit land with greater intensity when a donor-funded mayor is elected. The activities of these local elites have been traditionally affected by the countries internal conflict. However, how they are affected is directly linked to the kind of violent actor involved. While guerrilla groups have often obstructed and attack their business, paramilitary groups arise under the local elites umbrella and often protect and promote their interests. Given the history of violence in the country, we study how the illegal armed groups' violent acts affect our main result. Table 7 presents the heterogeneous effects by the number of group attacks and clashes.

The results are consistent with the historical alignment of these armed groups with local elites. While guerrillas attacks negatively impact the deforestation linked to a donor-funded victory, paramilitary attacks do not. Furthermore, conflicts between armed actors negatively affect the deforestation associated with a donor-funded mayor rule. Interestingly, the estimated negative effect of a guerilla attack is 3.8 times larger than the one of armed actor's clashes. This significant difference shows that guerilla actions are particularly harmful to the activities leading to the increase in deforestation related to a donor-funded mayor.

Fires. Fires are often used to open up terrain. There is anecdotal evidence of its use as common practice to clean forest areas for cattle ranching and cultivation [27]. This is a highly harmful and destructive practice that is heavily regulated by the law. We check for an increase in the forest fires' intensity in donor-funded ruled municipalities. A differential increase of intensity would be a strong indicator of more intense land exploitation and the more aggressive usage of environmentally harmful practices, many of them punishable by law.

Table 8 test for a discontinuous jump in the fire intensity, measured as average fire brightness, when a donor-funded mayor is elected. Consistent with our preferred interpretation, we find an increase in average fire intensity of 32.9% when a donor-funded mayor is elected relative to a self-funded victory.

The results are robust to selecting a linear or quadratic polynomial (table A8). Moreover, the effect is robust to selecting different bandwidths, as shown in figure A3. Although this is strongly indicative of a more harsh use of harmful techniques leading to deforestation, as shows the table 9, the effect is concentrated on the last year of government. This behaviour may be consistent with an increase in rent-seeking activities due to the end of the term and an increased risk of punishment in the future due to a change of government.

7 Concluding Remarks

The type of politician we elect matters. Using Colombia's mayoral elections as a case study, we provide evidence that the election of a privately funded politician potentially leads to a sizable increase in deforestation, especially by the end of their government term. An election of a donor-backed politician can accelerate deforestation dynamics by several channels. A first channel to consider is that these politicians engage in activities, such as more ambitious infrastructure projects, that ultimately result in more extensive deforestation. A second channel to examine is that their presence in power generates incentives to the population, or segments of it, to engage in behaviours that accelerate the destruction of the natural environment. We find evidence, at least suggestive, that indicates that both channels may be at works.

[27] The Foundation for the Conservation and Sustainable Development (FCDS by its Spanish acronym) has repeatedly raised awareness on the topic. See, for example, https://fcds.org.co/publicaciones/deforestacion-acaparamiento-y-ganaderia-en-la-amazonia-colombiana/

We find that donor-funded mayors are engaging in more expensive infrastructure projects on average. However, both by the size and timing of these jump in the contracted value with respect to municipalities ruled by non-donor-funded mayors, this cannot fully explain the rise in deforestation. Moreover, we find an increase in the intensity of fires in these municipalities, which is a reasonable indicator of unsustainable practices, such as fires to open up cattle terrains. Additionally, we find that broader State presence and vigilance reduces the deforestation linked to the rule of the donor-funded mayor. Besides, municipalities at conflict also have lower deforestation linked to the donor-funded mayor. More interestingly, the places that experienced violent attacks by armed groups that historically have opposed local elites significantly reduce the deforestation related to the donor-funded mayor. In contrast, the attacks of armed groups traditionally aligned with the elites did not change the deforestation dynamics linked to the mayor.

Although we prefer to consider these results as suggestive, they highlight the importance of vigilance and control outside the elected local authorities to control deforestation. Moreover, in a context of highly competitive election and scare public funding, were donor-funded politicians are abundant. Of course, this also opens the discussion of broader state funding, which reduces the chance of election a donor-funded mayor. Another important take away from the results is the importance of adequate previsions to avoid that an increase in infrastructure unavoidably induces higher deforestation.

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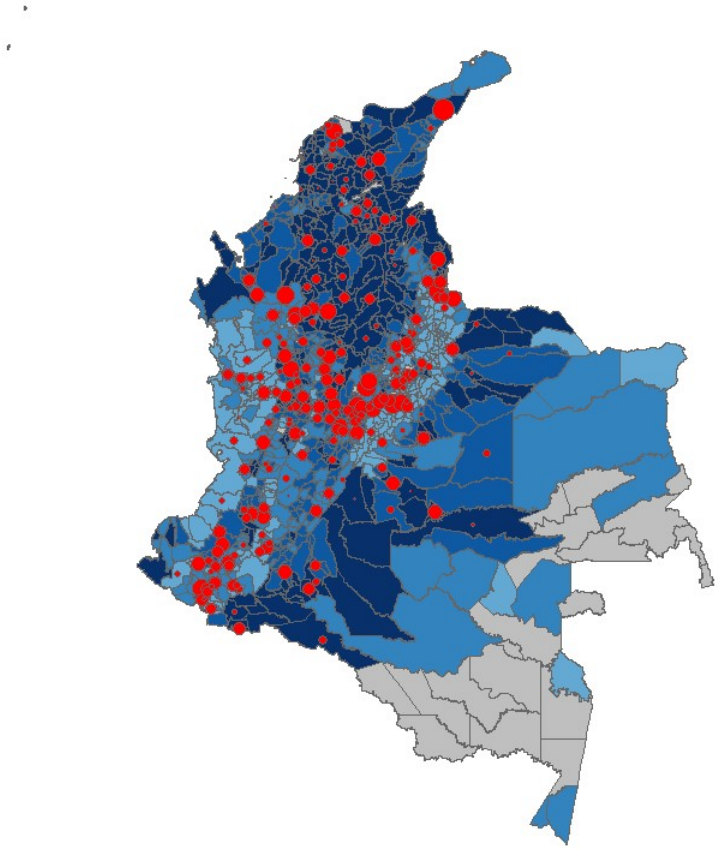
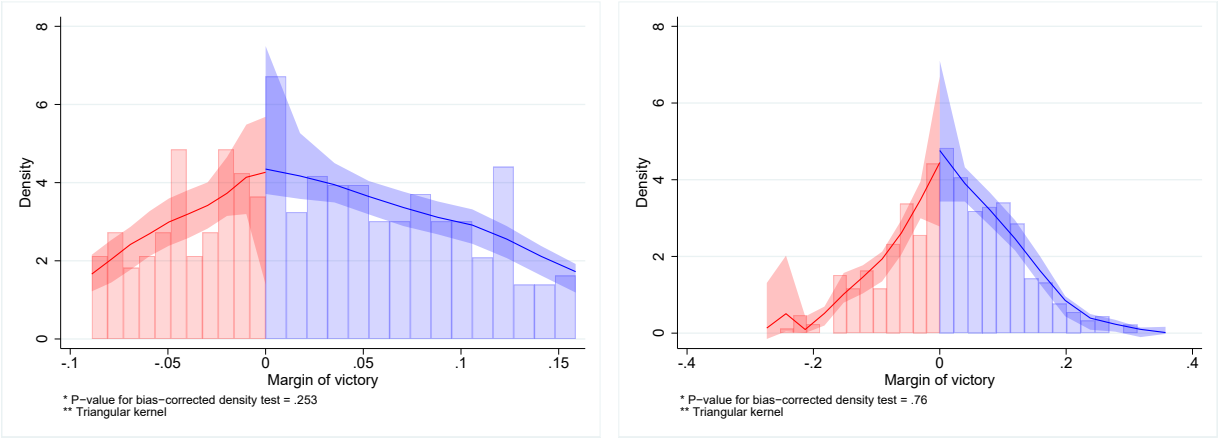
Figures

Figure 1: Deforestation during term by municipality - 2011 election period



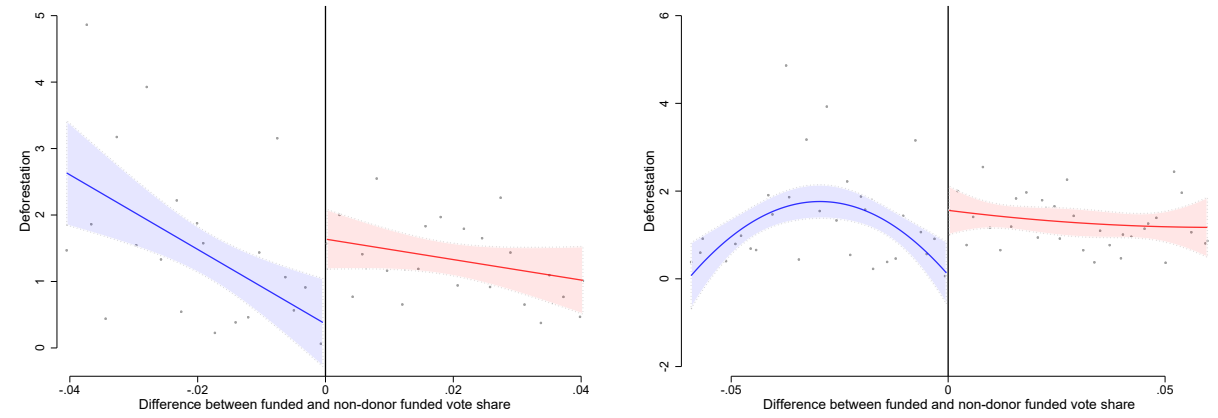
Note: The shades of blue correspond to the quartiles of the main variable. The bubble size correspond to the quartiles of the vote share of privately funded candidates.

Figure 2: Manipulation Test



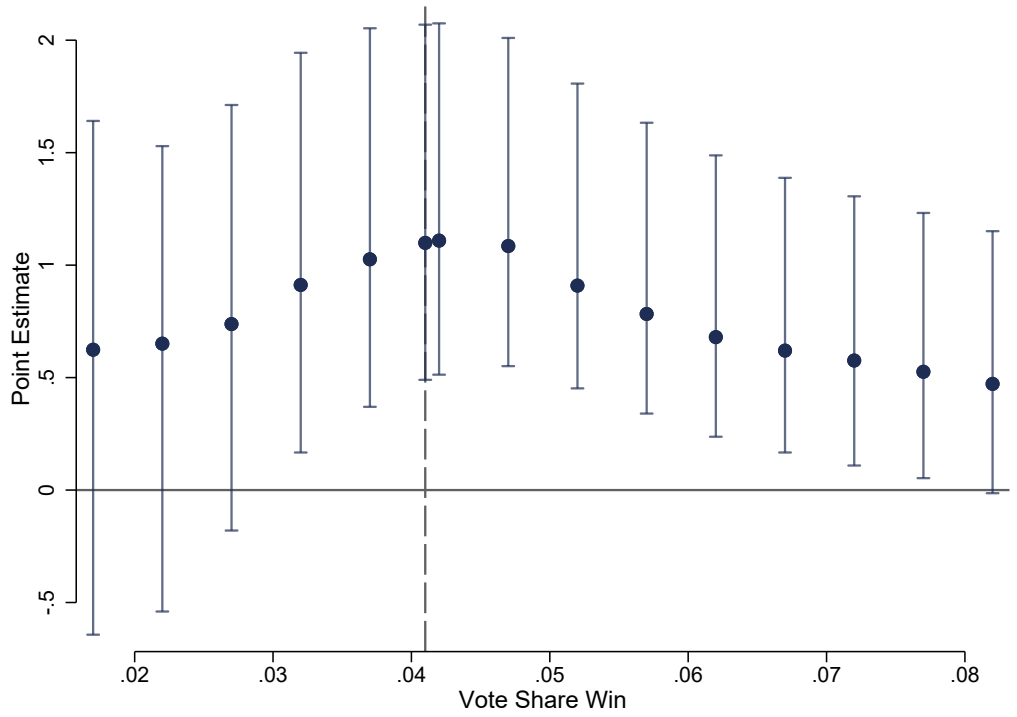
Note: Cattaneo et al. (2018) density test. From left to right; the first figure uses a linear polynomial approximation, meanwhile, the second uses a quadratic approximation.

Figure 3: Effect of electing a donor funded politician on deforestation



Note: RDD's graphical approximation. The observations are shown within Calonico et al. (2014) optimal bandwidth. From Left to right, linear polynomial and quadratic polynomial approximation.

Figure 4: Different bandwidth sizes: Effect of electing a donor-funded politician on deforestation



Note: Estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust 90% confidence intervals estimated following Calonico et al. (2014).

Tables

Table 1: Summary statistics

	Obs	Mean	Standard Deviation	Minimum	Median	Maximum
A. Elections						
Private income % total	2160	0.19	0.27	0	0	1
Margin of victory donor-funded	408	0.022	0.101	-0.354	0.019	0.383
B. Deforestation						
Deforestation ratio 2008-2011	1080	2.141	2.023	0	1.526	14.565
Deforestation ratio 2012-2015	1080	1.182	1.572	0	0.576	16.625

Note: This table presents summary statistics for the main variables of interest used in the analysis. An observation is a municipality except for the Private income % total that uses as unit of observation the candidate (top two candidates per each municipality).

Table 2: Effect of electing a donor funded politician on Deforestation during term in office

	(1)	(2)	(3)	(4)
	Loc. Linear Pol-1		*Loc. Linear Pol-2*	
Donor Funded	1.099***	0.627**	1.290**	0.972**
Robust p-value	0.008	0.019	0.026	0.021
CI 95%	[0.339, 2.220]	[0.127, 1.442]	[0.158, 2.471]	[0.158, 1.940]
Previous deforestation		✓		✓
Observations	408	408	408	408
Bandwidth obs.	132	174	191	198
Mean	1.183	1.183	1.183	1.183
Effect Mean(%)	92.90	53.00	109.05	82.16
Bandwidth	0.041	0.053	0.060	0.064
(Local) polynomial order	1	1	2	2

Note: Estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). In Columns (1) and (2) and in Columns (3) to (4), the(unknown) polynomial is approximated with local linear and quadratic polynomials, respectively. Panels (2) and (4) includes as covariate the measure of deforestation in the term of 2008-2011. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Effect of electing a donor funded politician on deforestation by year of government

	Year of government			
	1	2	3	4
Donor Funded	0.195***	0.220**	0.117	0.490***
Robust p-value	0.003	0.029	0.224	0.006
CI 95%	[0.077, 0.376]	[0.027, 0.504]	[-0.095, 0.404]	[0.164, 0.959]
Observations	408	408	408	408
Bandwidth obs.	132	139	187	130
Mean	0.211	0.306	0.211	0.455
Effect Mean(%)	92.42	71.90	55.45	107.69
Bandwidth	0.041	0.043	0.059	0.040
(Local) polynomial order	1	1	1	1

Note: Local linear estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). Each column regresses the deforestation rate for a given year of government. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Effect of electing a donor funded politician on contracts

	Infrastructure		*Environmental*		*Mining*	
	Number	*Avg. value*	*Number*	*Avg. value*	*Number*	*Avg. value*
	(1)	(2)	(3)	(4)	(5)	(6)
Donor Funded	-30.151	1.091**	-4.904	0.486	0.209	0.486
Robust p-value	0.357	0.017	0.742	0.150	0.637	0.150
CI 95%	[-127.980, 46.163]	[0.219, 2.258]	[-55.157, 39.293]	[-0.197, 1.294]	[-0.774, 1.265]	[-0.197, 1.294]
Observations	401	400	401	366	401	366
Bandwidth obs.	226	165	211	174	216	174
Mean	140.896	4.818	18.197	3.795	0.976	3.795
Effect Mean(%)	-21.40	22.64	-26.95	12.81	21.41	12.81
Bandwidth	0.077	0.049	0.073	0.062	0.074	12.81
(Local) polynomial order	1	1	1	1	1	1

Note: Local linear estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). The average value of contracts was transformed using inverse hyperbolic sine. The contracts are catalogued in each category by analysing their reported object. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Effect of electing a donor funded politician on infrastructure contracts per year of government

	Year of government			
	1	2	3	4
Donor Funded	0.520	0.484	1.391***	0.760
Robust p-value	0.245	0.252	0.008	0.116
CI 95%	[-0.410, 1.610]	[-0.404, 1.538]	[0.385, 2.597]	[-0.217, 1.968]
Observations	381	386	386	389
Bandwidth obs.	179	195	193	179
Mean	4.204	5.092	5.284	5.508
Effect Mean(%)	12.37	9.51	26.32	13.80
Bandwidth	0.060	0.070	0.068	0.058
(Local) polynomial order	1	1	1	1

Note: Local linear estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). The average value of contracts was transformed using inverse hyperbolic sine. The contracts are catalogued in each category by analysing their reported object. Each column regresses the average value of infrastructure contracts for a given year of government. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Heterogeneous Effects: State Presence

		Measure Z		
		(1)	(2)	(3)
		National Parks Area	CAR office	Distance to CAR
A	Privately funded mayor	1.117**	1.195**	-0.149
		(0.439)	(0.466)	(0.518)
	Z	0.210**	0.487	0.000309
		(0.105)	(0.592)	(0.00790)
B	Z × private funding	-0.279*	-1.610*	0.0371**
		(0.144)	(0.966)	(0.0153)
Observations		132	132	132
R-squared		0.051	0.062	0.209
Bandwidth		0.041	0.041	0.041
(Local) polynomial order		1	1	1
A + B		0.838	-0.416	-0.111
Effect size		93.09	-35.04	-15.12
Ho: $A + B = 0$				
F-statistic		4.39	0.24	0.05
P-value		.04	0.62	0.83

Note: Controls for the local linear polynomial. Observations restricted to those in the optimal linear bandwidth. Weighted using a triangular kernel. Effect size is calculates as $(A + B)/(constant + \beta_Z)$. National Parks Area in squared hectares. Distance in KM. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Heterogeneous Effects: Armed Conflict

		Measure Z		
		Attacks		
		(1)	(2)	(3)
		Paramilitary	Guerrilla	Conflict (Clashes)
A	Privately funded mayor	0.704*	1.133***	1.195***
		(0.422)	(0.427)	(0.433)
	Z	0.116	0.574***	0.138***
		(0.139)	(0.187)	(0.0453)
B	Z × private funding	0.123	-0.623**	-0.162**
		(0.153)	(0.241)	(0.0707)
Observations		132	132	132
R-squared		0.116	0.131	0.086
Bandwidth		0.041	0.041	0.041
(Local) polynomial order		1	1	1
A + B		0.827	0.510	1.033
Effect size		90.17	42.86	136.80
Ho: $A + B = 0$				
F-statistic		4.60	1.37	6.31
P-value		.03	0.24	0.01

Note: Controls for the local linear polynomial. Observations restricted to those in the optimal linear bandwidth. Weighted using a triangular kernel. Clashes includes any confrontation between any set of armed groups. An attack is an unilateral action. Effect size is calculates as $(A + B)/(constant + \beta_Z)$. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Effect of electing a donor funded politician on fire intensity

	(1)	(2)
Donor Funded	80.976*	75.464**
Robust p-value	0.059	
CI 95%	[-3.381, 181.446]	[3.189, 156.092]
Previous fire intensity		✓
Observations	408	408
Bandwidth obs.	195.000	198.000
Mean	246.141	246.141
Effect Mean(%)	32.90	30.66
Bandwidth	0.061	0.063
(Local) polynomial order	1	1

Note: Local linear estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). The contracts are catalogued in each category by analysing their reported object. Column (2) includes as covariate the measure of fire intensity from 2009-2011, being 2009 the first year with data availability. Fire intensity is measured as the average brightness of fires in a municipality. *** p<0.01, ** p<0.05, * p<0.1

Table 9: Effect of electing a donor funded politician on fire intensity per year

	Year of government			
	1	2	3	4
Donor Funded	31.434	55.882	1.715	110.844**
Robust p-value	0.461	0.225	0.978	0.018
CI 95%	[-65.426, 144.208]	[-42.699, 181.289]	[-110.545, 107.437]	[20.741, 224.285]
Observations	408	408	408	408
Bandwidth obs.	232	200	215	237
Mean	189.663	183.108	185.204	198.902
Effect Mean(%)	16.57	30.52	0.93	55.73
Bandwidth	0.078	0.066	0.073	0.082
(Local) polynomial order	1	1	1	1

Note: Local linear estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). The contracts are catalogued in each category by analysing their reported object. Fire intensity is measured as the average brightness of fires in a municipality. *** p<0.01, ** p<0.05, * p<0.1

A APPENDIX: Supplementary Figures and Tables

Table A1: Covariates Balance

Dependent variable	Mean	Std. Dev.	Donor fund. won	Std. Error.	Obs	P-value	Pval Canay
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Individual covariates							
Women	0.116	0.320	0.119	0.202	132	0.121	0.789
Age	45.245	9.709	-3.551	5.398	126	0.573	0.061
Black	0.044	0.205	-0.023	0.195	126	0.865	0.490
Asian	0.107	0.309	0.050	0.230	126	0.570	0.423
Leftist party	0.024	0.154	0.018	0.165	132	0.801	0.664
Rightwing	0.239	0.427	0.181	0.147	132	0.474	0.816
Previously sanctioned	0.121	0.326	-0.024	0.137	132	0.813	0.119
Ilegal Registration of ID.	0.005	0.071	0.013	0.009	132	0.268	1.000
Has political experience	0.448	0.497	0.326	0.196	132	0.157	0.323
Has electoral experience	0.361	0.480	0.156	0.181	132	0.336	0.871
Panel B. Policy Outcomes							
Total Income Y(COP M)	47102.906	361239.511	12723.550	8666.063	132	0.704	0.467
Land Taxes (%Y)	3.889	4.695	0.346	2.083	132	0.938	0.303
Industry (%Y)	3.377	5.967	1.378	1.755	132	0.823	0.252
Funct. expen. (%Y)	13.284	5.045	-1.439	4.719	132	0.535	0.758
Investment (%Y)	86.716	5.045	1.439	4.719	132	0.535	0.757
Deficit (%Y)	11.346	9.573	1.049	6.648	132	0.613	0.963
Panel C. Other municipality socio-economic characteristics							
Altitude (meter)	1158.170	1161.175	-227.936	571.983	132	0.885	0.164
Sq km	876.992	2982.007	-91.459	578.174	132	0.323	0.713
Distance Deparment capital	78.701	56.010	13.930	25.906	132	0.855	0.112
Distance to Bogota	319.459	189.400	-84.390	183.531	132	0.286	0.609
Literacy rate	83.903	8.484	-0.536	5.141	132	0.818	0.138
Rurality index (0-1)	0.564	0.239	-0.107	0.133	132	0.322	0.225
Unsatisfied basic needs	44.622	20.279	9.368	9.454	132	0.197	0.187
Panel D. Other potential explanations							
Deforest ratio previous term 2011	0.022	0.022	0.007	0.006	132	0.334	0.365
Disposable Income (mw)	29004.315	393732.953	1078.397	5317.036	126	0.719	0.305
Municipal category	5.708	0.995	0.095	0.241	132	0.264	1.000
Mayor wages	6.692	2.543	-0.190	0.481	132	0.264	1.000
Council size	10.957	2.907	1.775	1.292	132	0.217	0.081
Total population	41707.711	257110.752	8672.028	9205.110	132	0.926	0.214
Income from royalties	0.070	0.150	0.022	0.159	130	0.487	0.747
Education establishments	284.522	170.665	-70.098	73.363	132	0.840	0.256

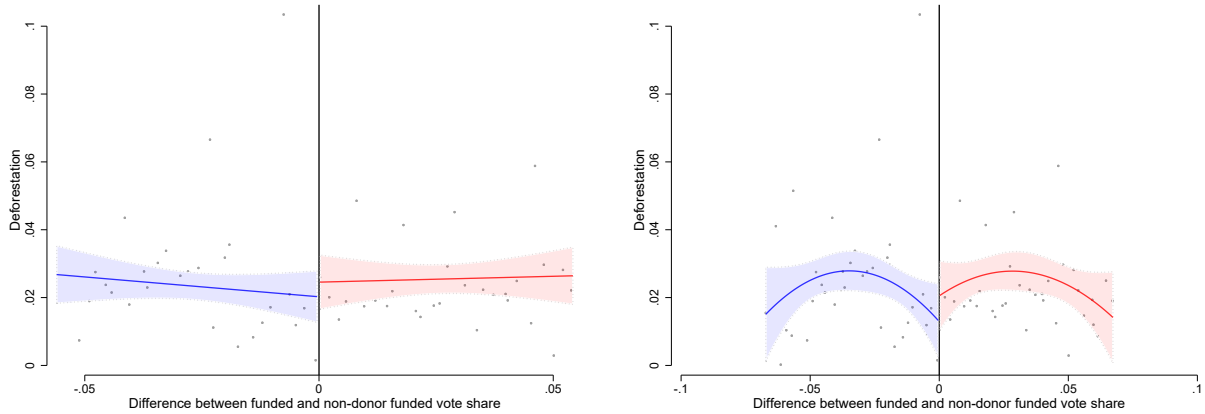
Note: he first two columns present the basic statistics (mean and standard deviation) of each covariate. Column (3) reports the RDD's point estimate of the effect of a donor-funded candidate victory on each covariate (as dependant variable), the Calonico et al. (2014)'s optimal bandwidth for the main model is used throughout. bias correction, and robust standard errors (column 4), with linear local polynomials and triangular kernels. The number of effective observations is detailed in column 5. Column 6 reports the estimated p-value. Column 7 reports the Canay and Kamat (2015) permutation statistic, taking into account the RDD's optimal bandwidth.

Table A2: Effect of electing a donor funded politician on Deforestation Ratio - Quadratic Polynomial

	Year of government			
	1	2	3	4
Donor Funded	0.002***	0.002*	0.002	0.005**
Robust p-value	0.009	0.074	0.166	0.048
CI 95%	[0.001, 0.004]	[-0.000, 0.005]	[-0.001, 0.006]	[0.000, 0.009]
Observations	408	408	408	408
Bandwidth obs.	188	200	209	187
Mean	0.012	0.012	0.012	0.012
Effect Mean(%)	16.67	16.67	16.67	41.67
Bandwidth	0.059	0.066	0.070	0.059
(Local) polynomial order	2	2	2	2

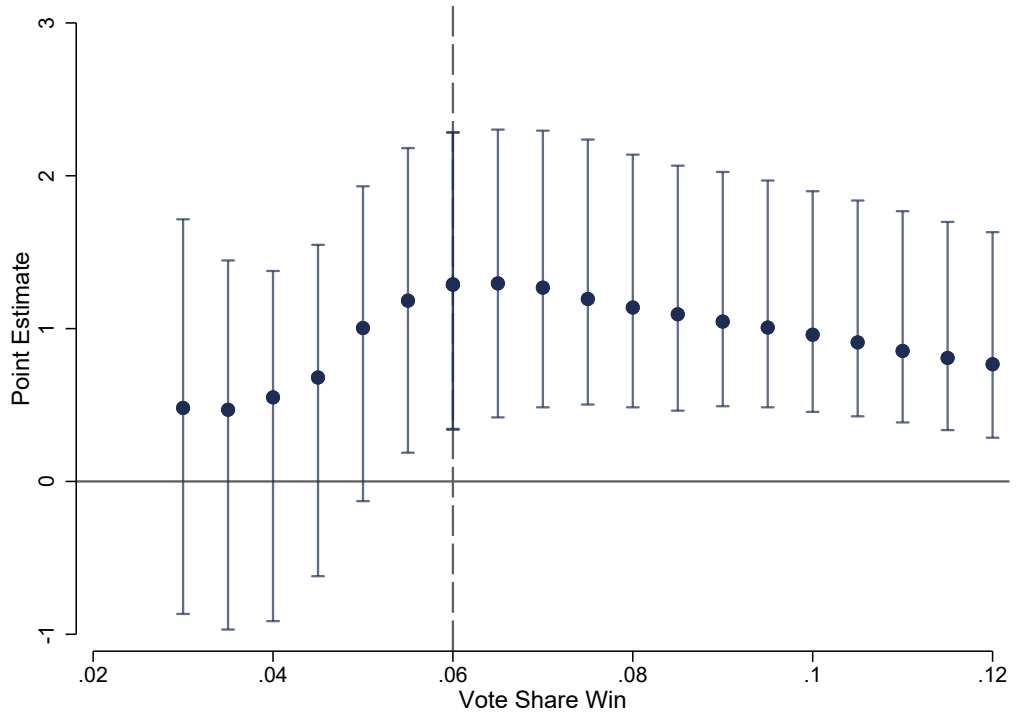
Note: Local quadratic estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). *** p<0.01, ** p<0.05, * p<0.1

Figure A1: Effect of electing a donor funded politician on the previous deforestation - Quadratic Polynomial - Quadratic Polynomial



Note: RDD's graphical approximation. The observations are shown within Calonico et al. (2014) optimal bandwidth. From Left to right, linear polynomial and quadratic polynomial approximation.

Figure A2: Different bandwidth sizes. Effect of electing a donor funded politician on deforestation



Note: Estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust 90% confidence intervals estimated following Calonico et al. (2014).

Table A3: Heterogeneous Effects: Right-wing affiliation

	(1)	(2)
A Privately funded mayo	1.139**	0.668
	(0.483)	(0.412)
Right-wing	0.0560	-0.870
	(0.547)	(0.789)
B Right-wing × private funding	-0.696	-0.643
	(0.989)	(0.822)
Observations	132	191
R-squared	0.057	0.077
Bandwidth	0.0410	0.0600
(Local) polynomial order	1	2
A + B	.443	.025
Effect size	54.471	2.535
Ho: $A + B = 0$		
F-statistic	.26	0
P-value	.61	.97

Note: Column 1 controls for the local linear polynomial, while column 2 controls for the local quadratic polynomial. Observations restricted to those in the optimal linear and quadratic bandwidths. Weighted using a triangular kernel. Effect size is calculates as $(A+B)/(constant+\beta_Z)$. National Parks Area in squared hectares. Distance in KM. *** p<0.01, ** p<0.05, * p<0.1

Table A4: Heterogeneous Effects: State Presence - Quadratic Polynomial

		Measure Z		
		(1)	(2)	(3)
		National Parks Area	CAR office	Distance to CAR
A	Privately funded mayor	0.679*	0.750*	-0.234
		(0.366)	(0.386)	(0.429)
	Z	0.348	1.532*	-0.00279
		(0.240)	(0.798)	(0.0101)
B	Z × private funding	-0.329*	-2.072***	0.0267**
		(0.176)	(0.660)	(0.0133)
Observations		191	191	191
R-squared		0.069	0.083	0.201
Bandwidth		0.0600	0.0600	0.0600
(Local) polynomial order		2	2	2
A + B		0.350	-1.322	-0.207
Effect size		17.56	-41.28	-12.05
Ho: $A + B = 0$				
F-statistic		.99	6.09	0.24
P-value		.32	0.01	0.62

Note: Controls for the local quadratic polynomial. Observations restricted to those in the optimal quadratic bandwidth. Weighted using a triangular kernel. Effect size is calculates as $(A + B)/(constant + \beta_Z)$. National Parks Area in squared hectares. Distance in KM. *** p<0.01, ** p<0.05, * p<0.1

Table A5: Heterogeneous Effects: Armed Conflict - Quadratic Polynomial

		Measure Z		
		Attacks		
		(1)	(2)	(3)
		Paramilitary	Guerrilla	Conflict (Clashes)
A	Privately funded mayor	0.337	0.733**	0.829**
		(0.364)	(0.367)	(0.367)
	Z	-0.0783	0.435*	-0.0195
		(0.144)	(0.227)	(0.287)
B	Z × private funding	0.168	-0.554**	-0.164
		(0.156)	(0.241)	(0.153)
Observations		191	191	191
R-squared		0.108	0.166	0.102
Bandwidth		0.0600	0.0600	0.0600
(Local) polynomial order		2	2	2
A + B		0.505	0.179	0.665
Effect size		30.50	8.68	40.54
Ho: $A + B = 0$				
F-statistic		2.43	0.21	3.13
P-value		.12	0.64	0.80

Note: Controls for the local quadratic polynomial. Observations restricted to those in the optimal quadratic bandwidth. Weighted using a triangular kernel. Clashes includes any confrontation between any set of armed groups. An attack is an unilateral action. Effect size is calculates as $(A + B)/(constant + \beta_Z)$. *** p<0.01, ** p<0.05, * p<0.1

Table A6: Effect of electing a donor funded politician on contracts - Quadratic Polynomial

	Infrastructure		*Environmental*		*Mining*	
	Number	*Avg. value*	*Number*	*Avg. value*	*Number*	*Avg. value*
	(1)	(2)	(3)	(4)	(5)	(6)
Donor Funded	-30.151	1.091**	-4.904	0.486	0.209	0.486
Robust p-value	0.357	0.017	0.742	0.150	0.637	0.150
CI 95%	[-127.980, 46.163]	[0.219, 2.258]	[-55.157, 39.293]	[-0.197, 1.294]	[-0.774, 1.265]	[-0.197, 1.294]
Observations	401	400	401	366	401	366
Bandwidth obs.	226	165	211	174	216	174
Mean	140.896	4.818	18.197	3.795	0.976	3.795
Effect Mean(%)	-21.40	22.64	-26.95	12.81	21.41	12.81
Bandwidth	0.077	0.049	0.073	0.062	0.074	12.81
(Local) polynomial order	1	1	1	1	1	1

Note: Local quadratic estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). The average value of contracts was transformed using inverse hyperbolic sine. The contracts are catalogued in each category by analysing their reported object. *** p<0.01, ** p<0.05, * p<0.1

Table A7: Effect of electing a donor funded politician on infrastructure contracts per year of goverment

	Year of government			
	1	2	3	4
Donor Funded	0.561	0.195	1.431**	0.886
Robust p-value	0.418	0.918	0.028	0.114
CI 95%	[-0.752, 1.812]	[-1.209, 1.344]	[0.161, 2.785]	[-0.230, 2.136]
Observations	381	386	386	389
Bandwidth obs.	210.000	217.000	268.000	265.000
Mean	4.204	5.092	5.284	5.508
Effect Mean(%)	13.34	3.83	27.08	16.09
Bandwidth	0.075	0.076	0.108	0.105
(Local) polynomial order	2	2	2	2

Note: Local quadratic estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). The average value of contracts was transformed using inverse hyperbolic sine. The contracts are catalogued in each category by analysing their reported object. *** p<0.01, ** p<0.05, * p<0.1

Table A8: Effect of electing a donor funded politician on fire intensity

	(1)	(2)
Donor Funded	92.839**	77.625
Robust p-value	0.044	0.145
CI 95%	[2.659, 187.461]	[-26.568, 180.535]
Previous intensity		✓
Observations	408	408
Bandwidth obs.	312	217
Mean	246.141	246.141
Effect Mean(%)	37.72	31.54
Bandwidth	0.124	0.073
(Local) polynomial order	2	2

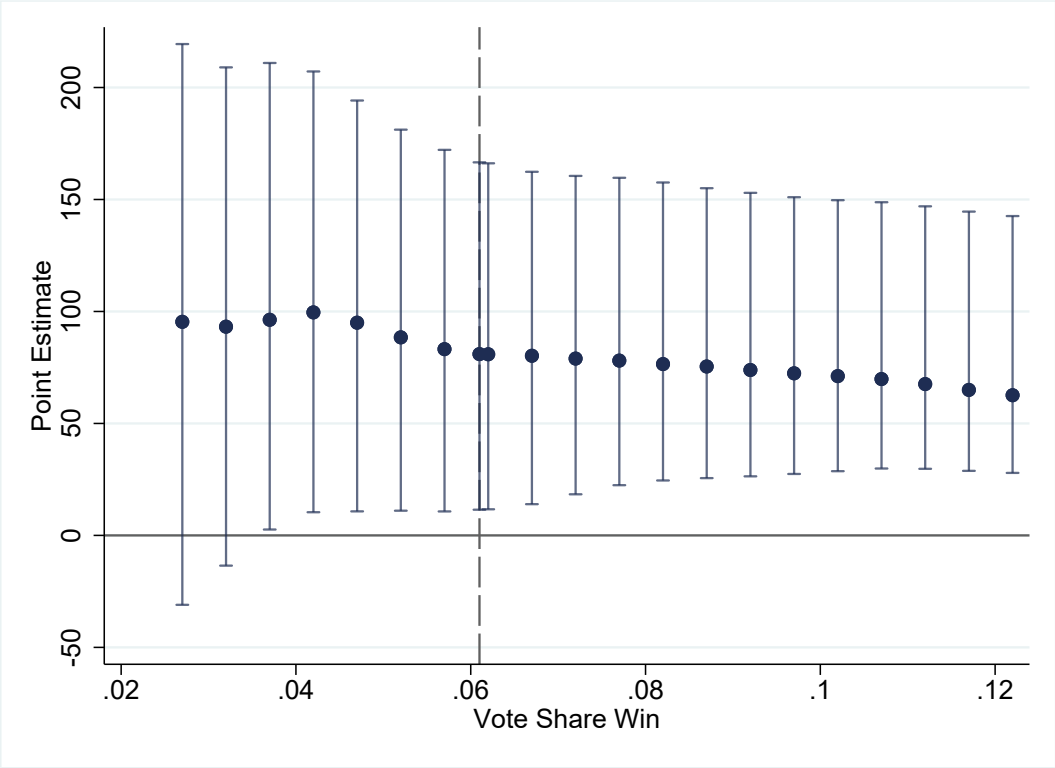
Note: Local quadratic estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). The contracts are catalogued in each category by analysing their reported object. Column (2) includes as covariate the measure of fire intensity from 2009-2011, being 2009 the first year with data availability. Fire intensity is measured as the average brightness of fires in a municipality. *** p<0.01, ** p<0.05, * p<0.1

Table A9: Effect of electing a donor funded politician on fire intensity per year

	Year of government			
	1	2	3	4
Donor Funded	51.029	118.096*	4.267	122.898*
Robust p-value	0.451	0.100	0.952	0.068
CI 95%	[-90.214, 203.103]	[-25.585, 292.761]	[-145.384, 154.528]	[-9.357, 256.419]
Observations	408	408	408	408
Bandwidth obs.	238.000	204.000	233.000	267.000
Mean	189.663	183.108	185.204	198.902
Effect Mean(%)	26.91	64.50	2.30	61.79
Bandwidth	0.082	0.068	0.079	0.097
(Local) polynomial order	2	2	2	2

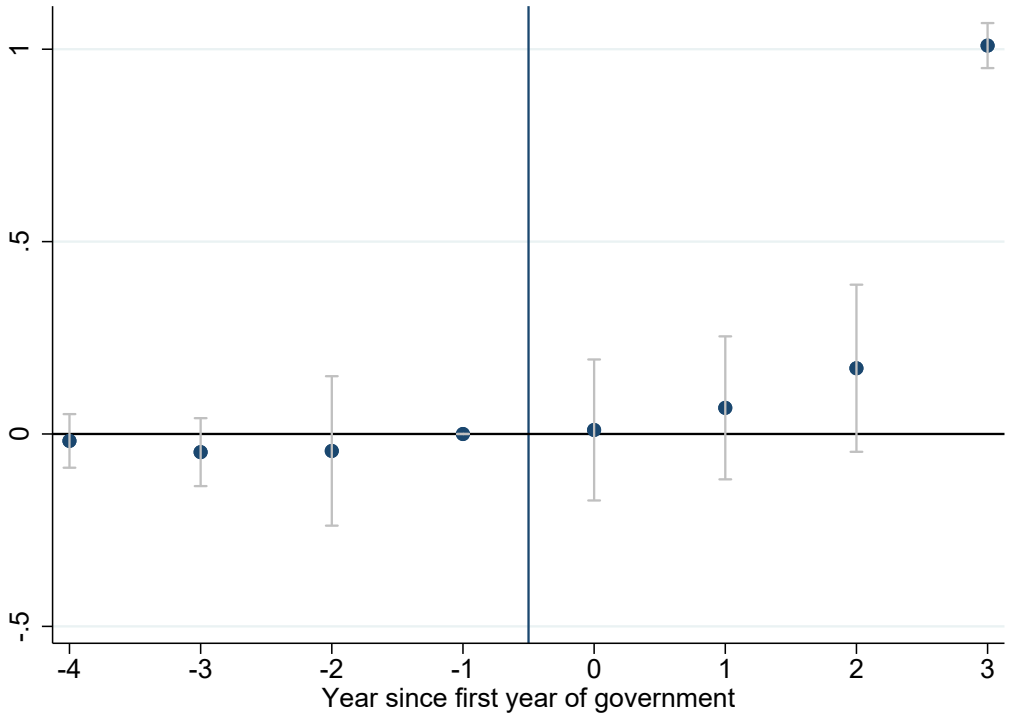
Note: Local quadratic estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust confidence intervals and p-values estimated following Calonico et al. (2014). The contracts are catalogued in each category by analysing their reported object. Fire intensity is measured as the average brightness of fires in a municipality. *** p<0.01, ** p<0.05, * p<0.1

Figure A3: Different bandwidth sizes. Effect of electing a donor funded politician on fire intensity



Note: Estimates calculated using optimal MSE bandwidths and triangular kernel weights. Robust 90% confidence intervals estimated following Calonico et al. (2014).

Figure A4: Effect of electing a donor-funded politician on deforestation: non-parametric DiD



Note: We perform a non-parametric DiD interacting the treatment by the year dummy. 90% confidence intervals. The year zero represents the first year of government and the year -1, is the election year. We use the full sample 408 of races between donor-funded and non-donor-funded top candidate.