Climate-related events and political campaign finances

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Abstract

This document studies the impact of climate-related events on campaign finance in mayoral races in Colombia. The exacerbation of natural events due to climate change may cause an income shock to the population, and may also cause transfers from the central government, which can lead to an increase in campaign contributions from different actors. By analyzing data from Colombian mayoral elections, this study found that climate-related emergencies had a significant impact on campaign income for mayoral candidates. The increase in funding was observed among multiple candidates and was attributed to candidates, their relatives, and private donors. Although the motives behind this increase in campaign contributions are not clearly evident, previous evidence from Colombia suggests that political donors are motivated by the benefits they receive from the candidates they support.

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1 Introduction

It is almost certain that the frequency and intensity of extreme heat and heavy precipitation, and other natural events they trigger, are increasing in most regions of the world due to climate change. According to the Intergovernmental Panel on Climate Change 2023 Synthesis Report (Lee & Romero, 2023), developing countries are more vulnerable to climate hazards due to historical and ongoing patterns of inequity. Previous literature has documented how natural disasters and their aftermath can provide insights into the incentives and behaviors of political actors such as politicians and voters (Oliver & Reeves, 2015), proving that these events can have major implications in a country's political environment. However, the available evidence of the effect of natural disasters on political campaign finance is limited, particularly for developing countries. Knowing how climate-related events can shape money in politics is key, given the increasing evidence of its pervasive influence on public resource allocation (e.g. Boas et al., 2014; Ruiz, 2017)[1] and the increasing effects of climate change.

Previous research on natural disasters and politics has focused on how natural disasters provide an opportunity for voters to assess their government's response and condition their vote. For instance, voters may reward the incumbent party for responding effectively to disasters (Cole et al., 2012), or they could reward the government for disaster relief spending but not for preparedness spending (Healy & Malhotra, 2009). Other studies consider the effect of natural disasters on political participation. On the one hand, these events can increase political participation measured as voter turnout by eliciting the importance of government action and policies (Fair et al., 2017; Sinclair et al., 2011). On the other hand, (Rudolph & Kuhn, 2018) finds that natural disasters such as floods have a negative impact on electoral participation. Regarding the mechanism behind this, (Kosec & Mo, 2017) argues that natural disasters can reduce citizen aspiration levels, which are positively correlated with various forms of civic engagement. For the Colombian case (Gallego, 2018) provides evidence of the positive effects of exposure to severe floods and landslides on the probability of the incumbent party being re-elected, the author suggests that relief funds are used by the incumbents to buy votes. Despite the focus on the role of money in natural disaster politics, few studies have analyzed the impact of such events on political campaign income and donations.

In this document, I present evidence of campaign finance response to natural disaster events in Colombia. In order to achieve this objective, I compiled a dataset of natural disasters by municipality using emergency reports, with a specific focus on climate-related disasters. These reports were obtained from the *Unidad Nacional para la Gestión del Riesgo de Desastres* (UNGRD), the Colombian entity responsible for the management of disaster risks. Additionally, I utilized a dataset of campaign income from the 2011 and 2015 local elections, which was constructed by (Ruiz, 2017). Employing a difference-in-differences strategy with 2011 as a baseline and pre-event period, I analyze the impact of climate-related emergencies on the campaign income of candidates in Colombian local elections.

My results suggest that municipalities that faced climate-related emergencies witnessed a surge in campaign income secured by mayoral candidates. This increase ranged from 11.9% to 22.3%, in contrast to unaffected municipalities. Furthermore, this surge in campaign income was distributed among several candidates, with those ranking 2nd to 4th registering higher campaign income com-

[1] See (Stratmann, 2005) for earlier literature on campaign expenditures, campaign contributions and their effect on contributors' welfare.

pared to their counterparts who occupied the same positions in unaffected municipalities. Additionally, the concentration of campaign entries decreased in affected municipalities. The increase in campaign income can be attributed to candidates, their immediate relatives, and private donors. Candidates, in particular, augmented their own funding in municipalities that experienced climate-related emergencies. The campaign income from private donors also increased in municipalities affected by climate-related events, and this was facilitated by more and larger donations. This result is similar to (Liao & Ruiz Junco, 2022), who find that extreme weather events can lead to an increase in campaign contributions to the U.S. Democratic Party, particularly in counties with anti-environment incumbent politicians[2].

The rationale behind this analysis is that if climate-related emergencies between 2012 and 2015 had not occurred, campaign income patterns in affected municipalities and those not affected would have followed a common trend. Hence, the difference in the actual trajectories of campaign income is the causal effect of the natural disasters. As I am comparing mayoral campaign income for the 2011 and 2015 elections, I do not have enough pre-periods to claim that campaign income in affected and un-affected municipalities had followed common trends. To overcome this, I use municipalities' total income as a proxy of campaign income. Previous studies have established a strong correlation between income and political giving (Ansolabehere et al., 2003; Sances & You, 2018). I employ an event study model to examine whether municipalities' incomes were trending similarly prior to the 2012-2015 natural disaster events, finding that the municipalities did follow common trends.

Exploring the mechanism behind this finding, first, I study if an income shock is the source of this increase in campaign income after climate-related events, as these events can trigger economic shocks as human and physical capital are affected. Using an event study model, I assess the yearly evolution of the municipalities' total income after being affected by a climate-related event for the first time between 2012 and 2015. My results suggest that natural disasters positively affected the municipalities' income in the short-to-medium term. This effect could come from an economic boost from national transfers (Roth & Wilson, 2023), which could have increased the need to attend to emergencies. For Colombia, (Gallego, 2018) provides evidence that after the 2010 and 2011 severe floods, there was an increase in aid income[3]. Using disaggregated municipalities' income, I find that national transfers did increase after a municipality experienced a climate-related emergency, suggesting that this is the primary source of the positive effect of natural disasters on income.

Upon presenting evidence of the potential origin of the increase in campaign revenue, I attempt to comprehend the underlying incentives that led to this augmentation. Prior research has delved into the reasons for political donations, as contributions can serve as a means of either political participation or investment seeking monetary returns (Ansolabehere et al., 2003). Notably, findings from the U.S. context, where a robust political party system and ideological races exist, suggest that political contributions are predominantly influenced by partisanship and ideology (Barber, 2016; Bonica, 2013; Brunell, 2005; Hill & Huber, 2017). In light of this, I hypothesize that if political participation motives are indeed the driving force behind the escalation in campaign contributions, then there must be an impact of climate-related emergencies on actions toward political participation, such as the number of candidates running for the mayoral elections and voter turnout. This

[2] To the best of my knowledge, this is the only study that finds effects of natural disasters on political campaign income.

[3] Additionally, a special fund called *Colombia Humanitaria* was created for the purpose of reconstructing local public goods

supposition is based on the premise that exposure to natural disasters can bring into focus the significance of government policies and their role, which could, in turn, encourage greater political engagement among citizens (Fair et al., 2017; Hajnal & Lewis, 2003; Kosec & Mo, 2017). However, I do not find any corroborative evidence that supports the hypothesis that political participation motivations have been instrumental in driving the upsurge in campaign income.

There is also evidence that even in the U.S. context, there are pecuniary interests driving political giving. For instance, (Gordon et al., 2007) finds that corporate executives are motivated to make political contributions by the belief that their contributions have the potential to change the policy outcomes that affect them. Regarding the influence of money on politics, a meta-analysis by (Brunell, 2005) supports the hypothesis that campaign contributions influence legislative voting behavior. Similarly, (Kalla & Broockman, 2016) and (Fouirnaies & Hall, 2018) provide evidence that donations can return economic benefits as donors receive preferential access to policymakers, influencing the policy process. This is also true in non-U.S. contexts, for Brazil (Boas et al., 2014) provide evidence that public-works firms that donate to ruling-party legislative candidates receive a boost in awarded contracts, (Arvate et al., 2013) find similar results with higher returns from donations to deputies from traditional parties. Highlighting the relationship between donor-funded politicians and environmental concerns, (Harding et al., 2023) shows that, in Colombia, the election of mayors who received campaign donations increases deforestation, as these donations purchase regulatory nonenforcement.

To examine if private contributors to political campaigns are driven by investment motives, I follow (Ruiz, 2017) to examine if private contributors to election winners receive economic benefits from their contributions. I estimate the effects of natural disasters on contracts awarded to donors to the winning candidate and find no statistically significant effects on awarded contracts. However, I consider that this is the most plausible motivation behind the increased campaign contributions after a natural disaster, as there is growing evidence that in developing democracies, winning campaign donors do receive preferential treatment in the public procurement process (Boas et al., 2014; Harding et al., 2023; Ruiz, 2017).

It is worth noting that previous literature has identified that emergency declarations can be politically motivated and, therefore, endogenous to political outcomes. One possible channel for endogeneity is the potential incumbent mayor's bid for re-election, as (Garrett & Sobel, 2003) find, for the U.S, a higher likelihood for disaster declarations and disaster relief expenditures in a presidential election year for states politically important for a president running for re-election. In a context closer to Colombia, (Cooperman, 2022) finds that mayors in Northeast Brazil are more likely to declare a drought and provide relief in election years in order to increase their chances of winning re-election. Regarding the possibility that my main results are biased due to the relationship between emergency reports and political incentives from the incumbent mayor, I provide arguments to explain why I consider this is not the case. Firstly, UNGR's emergency reports do not necessarily correspond to public calamity declarations, which are required to solicit relief assistance from the government. The annual consolidated emergency reports represent a record of registered emergencies in each municipality, some of which received national funding and others that did not. Secondly, in Colombia, mayors are elected through a simple plurality vote every four years and are barred from immediate re-election. Voting for the political party of the incumbent could also constitute a form of re-election, but the political landscape in Colombia is distinguished by weak

parties that lack ideological coherence (Milanese & Albarracín, 2022). Consequently, the main findings are improbable to be influenced by the endogeneity of emergency reports. I consider this to be a minor concern as my identification strategy is a difference-in-differences model within municipalities. Hence, random assignment of the treatment is not required to obtain causal treatment effects.

The remainder of this document is organized as follows: the next section describes the context of Colombia's natural hazards and climate-related emergency reports within the timeframe of 2012 to 2015 and the Colombian political income campaign environment. The data employed is delineated in Section 3, while the identification strategies adopted are explicated in Section 4. Section 5 showcases the primary findings of this document in conjunction with the corresponding robustness checks. Section 6 provides suggestive mechanisms, while Section 8 concludes.

2 Context

2.1 Natural hazards in Colombia

According to the World Bank's Climate Change Knowledge Portal, Colombia experiences the most frequent occurrences of extreme events in South America. A staggering 84 percent of its population and 86 percent of its assets are situated in areas that are exposed to two or more hazards. The country's rapid population growth in poorly planned urban areas, informal settlements, and densely populated coastal areas, along with the effects of climate change, are already worsening flooding and landslides. Furthermore, coastal and insular areas are at risk due to rising sea levels (The World Bank Group, 2023a).

The World Bank also produces countries' profiles to present their climate risk and potential impacts. According to Colombia's profile (The World Bank Group, 2023b), the country's notable climate hazards are related to sea level rise, droughts, floods, and landslides. Projections show that coastal floods will affect between 1.4 to 1.7 million people, 80% of which are living along the Caribbean coast and the other 20% along the Pacific coast. Rising temperatures have also increased drought-related conditions, exacerbating existing tensions for water usage between agricultural and livestock needs and human needs.

There is also inequity in the population's vulnerability to natural hazards, primarily because poorer municipalities are characterized by a growing population in informal settlements, which are prone to flooding and landslides. By 2012, vulnerability factors to flooding, landslides, and flash floods had rapidly increased in rural areas due to deforestation, soil erosion, inadequate occupation processes, and the implementation of disjoint production systems, which generated environmental degradation. Overall, municipalities with higher levels of Unmet Basic Needs Index have more considerable losses after a natural disaster, as these affect education and health services, deepening poverty factors primarily due to these municipalities' low recovery capacity (The Wolrd Bank Colombia, 2012).

2.2 Campaigns income in Colombia

Colombia's local mayoral elections occur every four years, and winners are elected under simple plurality. According to Law 136 of 1994, article 95, immediate re-election is not allowed, as a person

cannot run in a mayoral election if she held a public office in said municipality for 12 months before the election. Mayors have an essential role in the municipality's resource allocation and are central figures in advancing the interests of the municipality; article 15 of the 1991 Political Consitution of Colombia states that mayors are responsible for formulating and implementing an annual development plan. For the municipality's budget, each municipality has resources from the General System of Participations, General System of Royalities, co-financing resources, credits, and tax and non-tax revenues. As presented by (Ruiz, 2017), although transfers from the central government have specified expenses, mayors have discretion over an average of approximately 20% local spending, mostly over resources from property tax revenues which are destined to provide education, health care, water, and sanitation and overall functioning of the municipality.

Political organizations and electoral campaign financing are ruled by Law 1475 of 2011, which establishes income limits, origin, destination, and opportunity of expenditure reposition for votes, among other aspects. Political campaign financing relies on private and public income; private income includes the candidate's resources or from their direct relatives, credits from financial or particular entities, and donations from natural or juridical national persons. Public income includes advanced payments from the state, expenditure repositioning for votes, and indirect contributions such as access to communication media. As discussed in (Ruiz, 2017), the law[4] has established limits for total campaign income based on registered voters; these limits increase and limits jump discontinuously at arbitrary registered voter cut-offs. In addition, private individual donations cannot surpass the 10% of total campaign income. This law also bans certain types of donations, such as donations from companies or individuals whose 50% of their income in the previous year came from public contracts or subsidies, who administer public funds, who have a license to exploit State monopolies or who have permission to engage in gambling activities[5].

In 2011 and 2015, mayoral candidates' campaigns mainly relied on their or their direct relatives' resources, followed by contributions and donations from private origin. These two sources accounted for approximately 95% of the total campaign income in 2011 and 2015, with almost 80% from the candidates and their families. For Colombia, political campaigns generally depend on private resources, and the public funding system has limited relevance (Casas-Zamora & Falguera, 2016). Candidates have strong incentives to gain income for their campaigns, as there is a strong correlation between campaign spending and the probability of being elected (Gulzar et al., 2022; MOE, 2018). Contributions from family members and private donors come from few sources and can be considered significant. In 2011, the average donation from a family member was 8.2 M COP (2,700 USD), while in 2015, it was 13.2 M COP (4,300 USD); for private donors, the average donation was 1.85 M COP in 2011 and 2.52 M CPOP in 2015. The average private donations are almost four times the monthly minimum wage, and for both elections, the average number of unique private donors is approximately two. Hence, private donations are highly concentrated.

Contributing to a campaign is valuable for family members and private donors for different motives. (Rueda & Ruiz, 2022) finds that expressive motivations are likely to be stronger for family than for non-family donors, as there is no evidence of them receiving an economic benefit for their donations. Their behavior is expected to resemble the consumer-motivated donors described by (An-

[4] Law 130 of 1994

[5] Donations from foreign governments or individuals, from illegal activities, anonymous donations, donations from individuals who have been charged or convicted for a crime and from public employees (excluding elected officials) are also banned.

solabehere et al., 2003), who are motivated by the value of being involved in politics. Meanwhile, private donors are investment donors, (Ruiz, 2017) finds that when a donor-funded politician wins, the probability that she will award a contract to a donor increases by 8.6%.

These contributions are unlikely to be driven by political ideology or partisan preferences, as Colombia is characterized by a weak party system where, in 2011, only 35.4% of the population identified with a political party (Raga & Selingson, 2011). Democratizing reforms in the late 1980s and early 1990s reduced the power of intermediate-level party leaders over the distribution of selective incentives and gave more political and financial autonomy to local candidates, weakening the country's party system (Dargent & Muñoz, 2011). The lack of coherence within political parties is highlighted in local elections, where the local campaigns are rarely aligned with the political party that endorses them (Botero & Alvira, 2012).

3 Data

This document uses various data sources to construct a municipality-candidate level to study the effect of experiencing climate-related emergencies on local political campaign income.

To assess the impact of natural disasters on political campaign finances for local elections, I use emergency declarations compiled annually by the *Unidad Nacional para la Gestión del Riesgo de Desastres* (UNGRD), the Colombian entity in charge of the implementation of the management of the disaster risks. Importantly, these records include the date of the event and the affected municipalities. I use the 2011 local elections as the baseline and pre-treatment period for my empirical strategy. Hence, I am interested in the reported emergencies by municipalities between 2012 and the day before the 2015 elections, which occurred on October 25, 2015. Table 1 presents all the reported emergencies during the period of interest.

Table 1: All reported emergencies

	Declared emergencies	Percentage
Accident	613	4.171
Avalanche	78	0.531
Cold wave	2	0.014
Collapse	219	1.490
Contamination	53	0.361
Costal flooding	9	0.061
Drought	85	0.578
Earthquake	222	1.510
Erosion	14	0.095
Explosion	63	0.429
Flash flood	3	0.020
Hail	49	0.333
Landslide	1478	10.056
Lightning	76	0.517
Oil spill	26	0.177
Others	26	0.177
Poisoning	1	0.007
Riverine flooding	2620	17.826
Social emergency	8	0.054
Strong wind	2141	14.567
Structural fire	1180	8.028
Various	5	0.034
Vehicular fire	1	0.007
Volcan activity	19	0.129
Wildfire	5707	38.828
N	14698	

Source: Annual consolidated emergencies reports 2012-2015 by UNGRD.
Own elaboration.

As the objective of this document is to better understand how natural disasters can shape the role of money in politics and risk and projected adverse impacts and related losses and damages associated with climate change are expected to escalate in the near term (2021-2040) (Lee & Romero, 2023), I identify climate-related reported emergencies, and base on this my natural disaster definition. To ensure an objective and consistent approach [6], I employ the definition of events classified as natural hazards by the U.S Federal Emergency Management Agency (FEMA). This organization defines natural hazards as environmental phenomena that have the potential to impact societies and the human environment and a natural disaster as the negative impact following an actual occurrence of natural hazard in the event that it significantly harms a community (FEMA, 2023). Table 2 shows the natural hazard-related events, as defined by FEMA, within the UNGRD emergency reports. There are a total of 12486 climate-related emergency reports. A large majority are wildfires,

[6] For example, (Liao & Ruiz Junco, 2022)'s disaster definition is based on federal disaster declarations from FEMA, from which they identify climate-related disasters

riverine flooding, strong winds, and landslides, which is consistent with the World Bank's climate risk report for Colombia.

Table 2: Natural hazard-related emergencies

	Declared emergencies	Percentage
Avalanche	78	0.625
Cold wave	2	0.016
Costal flooding	9	0.072
Drought	85	0.681
Earthquake	222	1.778
Hail	49	0.392
Landslide	1478	11.837
Lightning	76	0.609
Riverine flooding	2620	20.984
Strong wind	2141	17.147
Volcan activity	19	0.152
Wildfire	5707	45.707
N	12486	

Source: Annual consolidated emergencies reports 2012-2015 by UNGRD. Own elaboration.

I use campaign income information from the National Electoral Commission, complied by (Ruiz, 2017). Since 2009, the Colombian National Electoral Commission has mandated campaign income reporting through the "Cuentas Claras" web application[7]. This was implemented to allow the citizens and communication media access to this information and, thus, exert more control and follow-up to the financing and accountability of political campaigns (Transparencia por Colombia, 2012). As discussed in (Ruiz, 2017; Transparencia por Colombia, 2016, 2012), compliance is high; for the 2011 elections, 93% of the 4,464 mayoral candidates reported their campaign finances, while for 2015, out of 4,563 mayoral candidates, 96% completed the report. This data classifies campaign income by its source, with the identification number for each entry. Table A1 shows the type of campaign sources as reported in the campaign reporting finance forms.

For climate-related emergencies, I focus on emergencies at the municipality level; national and department-level emergencies were omitted. I calculate the number of emergencies within the interest period to explore the effect of reported emergencies on the intensive margin. I keep only one report by event since several reports can be associated with the same event. I define a report as duplicated based on the date and description of the event within the same municipality. Descriptions with a similarity score greater than 96% were classified as duplicates and dropped. Figure A1 depicts the spatial distribution of the reported climate-related emergencies between 2012 and October 24, 2015, a day before the 2015 elections.

I use electoral data compiled by (Pachón & Sánchez, 2014), who uses data from the *Registraduría Nacional del Estado Civil*, the Colombian electoral authority. This data includes election results for the 2011 and 2015 local races and includes key variables such as casted votes by candidates and

[7] Resolution 1094 of 2009

winners' information. Additionally, I use the municipal panel from the Center for Economic Development Studies (CEDE), described in (Acevedo & Bornacelly, 2014)[8], with information on rurality, total and urban population, income, agricultural production, and geographical municipal characteristics. To test whether natural disasters have an effect on awarded contracts to winning campaign donors, I use public procurement data collected by (Ruiz, 2017) from the SECOP (Sistema Electrónico para la Contratación Pública), which registers information on all government contracts. Finally, I use electoral census data from *Registraduría Nacional del Estado Civil* to investigate whether climate emergencies had an effect on voter turnout as a measure of political participation.

Table 3 presents summary statistics for 2011 of the municipalities used in the analysis, comparing municipalities that experienced a climate-related emergency between 2012 and 2015 and those that did not. Panel A summarizes local campaign income outcomes, such as the total income and the average income entry. Panel B shows the variables related to campaign income from the candidates and their direct relatives; likewise, Panel C describes the income from private donors. Additionally, Panel D shows political municipality characteristics, including the number of candidates running in the elections, the concentration index of total campaign income[9], private income, and the number of private donations, as well as voter turnout. Finally, Panel E summarizes municipalities' characteristics such as rurarilty index, total population, and geographical characteristics.

Overall, municipalities that experienced a climate-related emergency received, on average, more campaign income both from the candidates and their direct relatives as well as from private donors. However, the average income entries are not statistically significantly different, nor are the average private donations. Regarding the political characteristics, in affected municipalities, more candidates ran for mayors in 2011, but campaign income was less concentrated. Additionally, voter turnout is higher in municipalities that were not affected by a climate-related emergency. Municipality characteristics that change over time, such as the rurality index and total population, are not balanced within groups. Therefore, these should be considered in the empirical strategy that will be explained in the next section. Table A2 reports summary statistics at the candidate/campaign level for 2011.

[8] At Universidad de los Andes, Colombia

[9] Defined as the Herfindahl-Hirschman Index computed over candidates/campaigns within the same municipality

Table 3: Mean differences of outcomes of interest and covariates in 2011 - Municipality level

	Pure controls	Ever treated	Difference	s.e.	Control obs	Ever treated obs
A. Campaign income						
Total campaign income	78.995	149.412	-70.417***	(22.955)	268	784
Average income entry	8.305	8.546	-0.241	(0.415)	268	784
B. Income from candidates and direct relatives						
Income from the candidate or direct relatives	60.759	86.841	-26.082***	(6.909)	268	784
Number of entries	7.187	8.695	-1.509***	(0.440)	268	784
Average entry value	9.731	10.473	-0.742	(0.488)	268	784
Number of entries by the candidate	4.466	5.416	-0.949***	(0.275)	268	784
Number of entries by direct relatives	2.720	3.279	-0.559*	(0.290)	268	784
Average donation over family donors	7.746	7.807	-0.061	(0.610)	192	584
C. Income from private donors						
Income from private donors	14.491	45.804	-31.313**	(12.934)	268	784
Number of donations	4.235	8.524	-4.289***	(1.193)	268	784
Average donation	2.920	3.375	-0.455	(0.284)	268	784
Number of donors	3.828	7.434	-3.605***	(1.014)	268	784
Average donation over donors	3.140	3.636	-0.496	(0.303)	268	784
D. Municipality political characteristics						
Number of candidates in election	3.396	3.798	-0.403***	(0.106)	268	784
Campaign income concentration index	0.444	0.416	0.027***	(0.010)	268	784
Private number of donations concentration index	0.574	0.571	0.003	(0.028)	268	784
Private income concentration index	0.587	0.582	0.006	(0.029)	268	784
Voter turnout	0.693	0.665	0.028***	(0.006)	267	784
E. Municipality characteristics						
Rurality index	0.612	0.543	0.069***	(0.017)	268	784
Total population	15.784	51.953	-36.169*	(18.455)	268	784
Distance to department's capital Km	91.076	75.452	15.624***	(3.982)	268	784
Municipality area Km2	610.164	980.483	-370.319*	(212.971)	268	784
Altitude (MASL)	1093.235	1172.943	-79.708	(82.354)	268	784

*p<0.10, ** p<0.05, ***p<0.01

Note: Campaign incomes in millions of colombian pesos

Note: Populations in thousands

4 Empirical strategy

To determine the causal effect of climate-related emergencies on political campaign income, I exploit the occurrence of climate-related emergencies from 2012 to 2015, which are not geographically concentrated, as I observed spatial variation across the country. Consequently, I argue that the

occurrence of these events is exogenous to the local elections and their political process, although this is not necessary for the estimation strategy I will describe next.

In this document, I use a difference-in-difference estimator to compare political campaigns' income in municipalities affected and not affected by climate-related emergencies. Mayoral elections in 2011 serve as a baseline; all municipalities are considered unaffected in this year and I impose zero registered emergencies in this year. While the 2015 elections serve as a post-event for comparison. To identify a municipality as treated, I consider it affected if it experienced at least one climate-related emergency between 2012 and 2015. Figure 1 summarizes the data used in this document in a timeline.

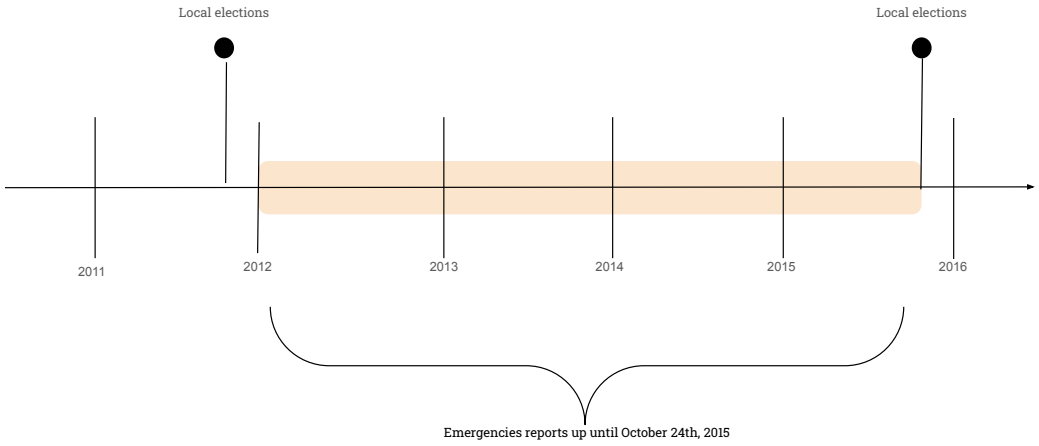


Figure 1: Timeline of the data

Following the previous definition, Table 4 shows the number of treated and pure control municipalities. It is worth noting that the annual emergency reports by UNGRD record the damages caused in terms of inhabitants and public goods affected. However, I do not define a shock based on the level of affectation, as there is no established threshold for either human or public good affectation at which climate-related events become politically salient. Choosing one arbitrarily could lead to measurement errors.

Table 4: All reported emergencies

	Municipalities	Percentage
2011		
Pure controls	1052	100.00
Ever treated	0	0.00
2012-2015		
Pure controls	296	28.14
Ever treated	756	71.86

Source: Annual consolidated emergencies reports 2012-2015 by UNGRD.
Own elaboration.

Following the differences-in-differences basic model of 2x2, the models I will estimate include municipality and year fixed effects in a linear regression. Municipality fixed effects control for any specific characteristics that do not change over time and might affect political campaign income or other political outcomes of interest, such as historical conditions or geographical characteristics. Time fixed effects control for political and economic events that occurred in a particular year and that affect each municipality equally. These could include political reforms that might change political campaign rules or economic changes that affect the country. Thus, the basic specifications that are estimated are:

$$\text{E}_{it} = \alpha_i + \text{Election\_2015}_t + \delta(\text{Ever\_treated}_i \times \text{Election\_2015}_t) + \mathbf{X}_{it-1}\phi + \varepsilon_{it} \quad (1)$$

$$\text{E}_{it} = \alpha_i + \text{Election\_2015}_t + \delta(\text{N\_climate\_emergencies}_i \times \text{Election\_2015}_t) + \mathbf{X}_{it-1}\phi + \varepsilon_{it} \quad (2)$$

Where E_{it} is the campaign finance outcome of interest in municipality i at election year $t = 2011, 2015$. α_i is a vector of municipality-fixed effects while $Election\_2015_t$ is a dummy variable, which indicates if the election analyzed is 2011 or 2015, as I am analyzing two elections, $Election\_2015_t$ also represents the time effects. $\mathbf{X}_{it}$ is a vector containing time-varying municipality-level controls that are not balanced in the municipalities. To avoid potential endogeneity caused by the inclusion of post-treatment covariates that could be affected by climate-related emergencies, I include pre-emergency fixed values of the selected covariates and interact them with a 2015 election dummy. Table 3 reports mean differences and their p-value of outcomes of interest and covariates in ever-treated municipalities and pure controls in 2011. These results show that the rurality index and total populations should be included in the $\mathbf{X}_{it-1}$ vector. Finally, ε_{it} represents an error term for municipality i at election year t.

The coefficient of interest in equations 1 and 2 are the interaction terms $\text{Ever\_treated}_i \times \text{Election\_2015}_t$ and $\text{N\_climate\_emergencies}_i \times \text{Election\_2015}_t$. Ever_treated_i equals 1 if the municipality experienced at least one climate-related emergency in the period 2012-2015[10] and 0 otherwise, while

[10] Specifically, before the 2015 elections.

N_climate_emergencies $_i$ indicates the number of climate-related emergencies that a municipality experienced during the period of interest. Thus, δ in equation 1 measures the effect of experiencing at least one climate-related emergency on campaign income in the 2015 elections compared to 2011. Likewise, δ in equation 2 captures the effect of an additional climate-related emergency on campaign income. Both models are estimated using robust standard errors at the municipality level.

The difference-in-difference estimator validity relies on the assumption that campaign income in affected and unaffected municipalities would have followed a common trend in the absence of treatment, i.e., a climate-related emergency. Consequently, the difference in the realized trajectories can be considered as the causal effect of experiencing a climate-related emergency. To test the validity of this assumption, the common practice would be to test whether being treated, in this case, having experienced a climate-related emergency between 2012 and 2015, had a non-statistically significant effect before 2011. However, as explained in Section 3, campaign finance reporting was mandatory from the 2011 local elections onwards. Consequently, I do not have access to pretreatment periods to test the common trends assumption.

In order to establish the causal effects of experiencing a climate-related emergency through the difference-indifference model proposed, it is essential to provide evidence that the common trends assumption holds. To that end, I will test this assumption on the municipalities' total income, arguing that these variables would exhibit similar trends. As evidenced by the summary presented in Table A2, it is noteworthy that nearly 90% of the campaign income garnered by mayoral candidates in Colombia is derived from their personal resources, their immediate relatives' resources, or private donors. This suggests that a significant proportion of the income stems from political donations from the candidates' families or private donors.

The literature has documented a robust correlation between political giving and private income. According to (Ansolabehere et al., 2003), income is the most potent predictor of giving to political campaigns and organizations. Similarly, (Bonica & Rosenthal, 2015) reveal that in the U.S, the wealth elasticity of individual contributions to federal candidates, parties, and political committees (PACs) is greater than one, implying that a 1% increase in an individual's wealth leads to more than a 1% increase in their political contributions. For Colombia, (Gulzar et al., 2021) find that wealthier donors tend to donate more to political campaigns with the expectation of receiving rewards from an elected candidate, and they may increase their donations even further when contributions limits are looser.

Using annual income data from municipalities as a proxy of private income and identifying the first occurrence of a climate-related emergency, I can estimate changes in income for affected municipalities compared to those that have not experienced such emergencies, or that will not be affected during the period of interest. I estimate this using an event study model, using 2011 as a pretreatment period, that allows me to assess the evolution of municipalities' income while controlling for fixed differences across municipalities and national trends over time. By analyzing income behavior before the first emergency, I can check whether affected and un-affected municipalities followed similar trends. The equation I estimate:

$$Y_{it} = \beta_t + \alpha_i + \text{Ever\_treated}_i \times \sum_{\substack{y=-3 \\ y\neq 0}}^{3} \beta_y \mathbf{I}\left(t - t_i^* = y\right) + \varepsilon_{it}. \tag{3}$$

Where Y_{it} is a municipality income variable for municipality i in year y. The variable $Ever\_treated_i$ equals 1 if municipality i experienced a climate-related emergency between 2012 and 2015, and 0 otherwise. Indicator variables $\mathbf{I}(t - t_i^* = y)$ measure the time relative to the first time a municipality experienced a climate-related emergency, t_i^*, in each municipality, and are 0 in all periods for municipalities that did not experience such events. The omitted category is $y = 0$, the year a municipality experienced a climate-related emergency for the first time. Therefore, each estimate of β_y provides the change in income in affected municipalities relative to unaffected municipalities during year t, as measured from the year the emergency occurred. The event-study model is estimated using robust standard errors at the municipality level.

I estimate equation 3 for the municipalities' total income and its components, current income, and capital income. Municipalities' current income includes tax revenues, non-tax revenues, and current transfers, while capital income includes royalties, national transfers, co-financing, and other capital income. The results are presented in Figure A2 and in Table A3, where I find that the estimated coefficients associated with event times $y = -3$ to $y = -1$ for the total municipalities' income and its components are relatively small and not statistically significant at the 99% confidence level. These results suggest that affected and unaffected municipalities were trending similarly prior to the first climate-related emergency, providing evidence for the common trend assumption.

5 Results

This next section will present the results from the empirical strategy described in the previous section. The results of estimating the effect of experiencing at least one climate-related emergency on political campaign income are presented in Table 5. This table presents the estimated coefficients of Equation 1 and Equation 2, where the coefficients of interest are $Evertreated \times Post$ and $NEmergencies \times Post$. Columns 1 and 2 estimate the effect of experiencing at least one climate-related emergency with and without municipality-level control variables, while columns 3 and 4 estimate the effect of being affected by a climate-related emergency measured as the total number of emergencies experienced by a municipality between 2012 and a day before the local elections of 2015. The number of emergencies was standardized to facilitate interpretation.

The results show a positive and statistically significant effect of climate-related emergencies on the campaign income secured by mayoral candidates in local elections. Mayoral candidates in municipalities affected by a climate event have a campaign increase in income of 40.33 M COP compared to those unaffected; this increase is 63.66 M COP per an increase of one SD on the number of climate-related emergencies. The effect on the intensive margin ranges from around 11.9% to 31.9% of the never-treated municipalities mean, while on the extensive margin, it ranges from around 22.3% to 50.4%. These results are robust to including municipality-level covariates that were not balanced between affected and unaffected municipalities in 2011.

In Figure A3, I observed a skewed distribution of total campaign income. To address this, I estimated the most strict model, Equation 1, using as outcome variable the logarithmic transformation of total campaign income. I also limited extreme values identified by different percentiles in the variable distribution. This analysis indicated that there are no significant effects on the logged total campaign income, as displayed in Column 1 of Table A4 and Table A5. It is worth noting that concerns have been raised about the use of logarithmic transformations in difference-in-differences

models, particularly when the distributions of treated and untreated groups are sufficiently different in the pre-treatment period (See (McConnell, 2023) for further discussion). Still, the results presented in Table A4 demonstrate that the effect remains significant when trimming outliers. However, Table A5 indicates that the results are not robust to taking out outliers and adding municipality-level controls.

Table 5: Effect of climate-related emergencies on political campaign income

	All campaigns income			
	(1)	(2)	(3)	(4)
Ever treated x Post	40.329***	14.982**		
	(12.274)	(7.058)		
N Emergencies x Post			63.666***	28.173**
			(22.236)	(13.459)
Post	27.206***	86.154***	29.080***	67.350***
	(5.257)	(24.573)	(6.374)	(21.926)
Controls	No	Yes	No	Yes
Control mean	126.342	126.342	126.342	126.342
Effect size	0.319	0.119	0.504	0.223
Municipalities x year	1052	1052	1052	1052
N(municipalities)	2104	2104	2104	2104

Standard errors in parentheses
Campaign income in millions of colombian pesos
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To examine if this increase in campaign income is concentrated among a few candidates, I estimate the effect of being affected by a climate-related emergency on the Herfindahl-Hirschman Index of campaign income and income entries within each municipality and on the total campaign income of mayoral candidates who placed first to fourth in the elections. In column 4 of Table 6, I find that in affected municipalities, the concentration of the number of campaign income entries decreased by 0.012 percentage points per an increase of one SD on the number of climate-related emergencies, which accounts for approximately 2.8% of the unaffected municipalities' concentration index mean. This result is only statistically significant when measuring affectation as the number of experienced climate-related emergencies. I find no significant effects on the concentration index of campaign income. Based on this analysis, it can be inferred that the overall concentration of campaign income during mayoral elections remained unaffected after experiencing climate-related emergencies. However, the results indicate that a higher number of candidates were able to collect additional campaign income.

Table 6: Effect of climate-related emergencies on political campaign income concentration index

	HHI number of income entries				HHI campaign income			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ever treated x Post	-0.024	-0.027			-0.016	-0.017		
	(0.021)	(0.021)			(0.021)	(0.021)		
N Emergencies x Post			-0.008	-0.012**			-0.004	-0.006
			(0.006)	(0.006)			(0.006)	(0.006)
Post	0.040**	0.067**	0.026***	0.058**	0.001	0.008	-0.009	-0.000
	(0.018)	(0.029)	(0.009)	(0.024)	(0.018)	(0.030)	(0.010)	(0.025)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Control mean	0.435	0.435	0.435	0.435	0.444	0.444	0.444	0.444
Effect size	-0.055	-0.062	-0.019	-0.028	-0.036	-0.038	-0.009	-0.013
Municipalities x year	1052	1052	1052	1052	1052	1052	1052	1052
N(municipalities)	2104	2104	2104	2104	2104	2104	2104	2104

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Based on the outcome of the concentration index analysis of the number of campaign entries in the context of climate-related emergencies, the results presented on tables Table 7 and Table 8 demonstrates that candidates who placed second to fourth in local mayoral elections received more campaign income in affected municipalities. I find this effect to be statistically significant and was more pronounced for candidates who ranked lower. At the intensive margin, second-place candidates experienced a 25.1% effect, while third-place candidates experienced a 79.5% effect, and fourth-place candidates experienced a 127.6% effect compared to municipalities that were not affected by climate-related emergencies[11]. It is important to note that these findings can be attributed to the existence of limits on total campaign contributions. In Colombia, investing in a mayoral campaign can generate substantial returns, leading donors seeking financial gains to allocate their investments towards different candidates when faced with contribution limitations (see (Gulzar et al., 2021; Harding et al., 2023; Ruiz, 2017)).

[11] I find no effect on vote share for these candidates

Table 7: Effect of climate-related emergencies on political campaign income 1st and 2nd place

	First place				Second place			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ever treated x Post	5.714	-3.066			9.979*	0.939		
	(6.279)	(4.034)			(6.046)	(3.494)		
N Emergencies x Post			12.684	-2.900			17.356	2.779
			(12.674)	(5.906)			(12.291)	(7.061)
Post	17.339***	25.959*	15.933***	26.630**	7.156***	12.436	6.383*	9.717
	(3.297)	(13.962)	(3.369)	(12.435)	(2.711)	(12.894)	(3.563)	(11.727)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Control mean	52.252	52.252	52.252	52.252	39.823	39.823	39.823	39.823
Effect size	0.109	-0.059	0.243	-0.055	0.251	0.024	0.436	0.070
Municipalities x year	1052	1052	1052	1052	1046	1046	1046	1046
N(municipalities)	2064	2064	2064	2064	1980	1980	1980	1980

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Effect of climate-related emergencies on political campaign income 3rd and 4th place

	Third place				Fourth place			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ever treated x Post	23.366**	9.052			26.547**	20.880**		
	(11.543)	(6.313)			(12.961)	(10.603)		
N Emergencies x Post			32.839*	15.124			22.854***	20.570**
			(17.969)	(12.081)			(8.273)	(9.236)
Post	2.480	17.254	-0.237	3.191	-6.138	14.699	-1.154	8.225
	(4.095)	(21.535)	(7.165)	(19.139)	(7.275)	(23.310)	(5.915)	(18.062)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Control mean	29.375	29.375	29.375	29.375	20.806	20.806	20.806	20.806
Effect size	0.795	0.308	1.118	0.515	1.276	1.004	1.098	0.989
Municipalities x year	901	901	901	901	573	573	573	573
N(municipalities)	1390	1390	1390	1390	748	748	748	748

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To better understand which actors contributed more to the increase in campaign income, I conducted an analysis to investigate the impact of climate-related emergencies on the six different sources of campaign funds, as listed in Table A1. For ease of interpretation, the findings are presented in three separate tables, each one reflecting the effect of experiencing at least one climate-related emergency and the effect of experiencing one or more such emergencies for each campaign income source. The analysis reveals that there is a statistically significant positive effect on the income coming from the candidate and their direct relatives, as well as from private donors, see Table 9. For the most strict specifications, this effect represents 16.6% of the average income from the

candidate and their direct relatives and 13.4% of the average income from private donors in unaffected municipalities. When the effect of a one SD deviation increase on the number of climate-related emergencies is considered, the impact amplifies to 26.8% of the mean for income from the candidate and their close relatives and to 27.5% of the mean for income from private donors. However, these effects are suggestive as they are not robust to adding municipality-levels controls. Climate-related emergencies did not have a statistically significant effect on income from credits, public events, state funding, and political parties (Results are reported in Table A6 and Table A7).

Based on the data shown in Figure A3, it can be observed that the distribution of the campaign income from the candidates and their close relatives, as well as from private donors, is skewed. To test whether the positive effect on these campaign income sources is robust to different transformations, I test the specifications on the logarithm of the incomes and on trimmed distributions. The results are presented in Table A8 and Table A9, which indicate that there is no statistically significant effect when considering the logarithm of the campaign income from the candidate and direct relatives. However, the effect remains significant in the majority of cases when adding municipality-level controls and trimming down different percentiles of the distribution. Conversely, the effect of the campaign income from private donors is less robust to these transformations, as demonstrated in Table A10 and Table A11.

Table 9: Effect of climate-related emergencies on political campaign income from candidates, close relatives, and private donors

	Candidates and direct relatives				Private donors			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ever treated x Post	21.218***	13.391**			19.569**	4.551		
	(7.470)	(6.184)			(8.589)	(4.382)		
N Emergencies x Post			27.363**	21.547*			33.541*	9.308
			(11.447)	(11.775)			(17.425)	(8.205)
Post	20.937***	66.527***	24.638***	53.813***	4.022	21.129	3.759	14.572
	(4.530)	(19.823)	(4.449)	(17.434)	(3.063)	(16.161)	(4.320)	(15.069)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Control mean	80.501	80.501	80.501	80.501	33.905	33.905	33.905	33.905
Effect size	0.264	0.166	0.340	0.268	0.577	0.134	0.989	0.275
Municipalities x year	1052	1052	1052	1052	1052	1052	1052	1052
N(municipalities)	2104	2104	2104	2104	2104	2104	2104	2104

Standard errors in parentheses
Campaign income in millions of colombian pesos
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To explore the composition of the increase in campaign income in municipalities that experienced climate-related emergencies, a breakdown of the income composition from the candidates and their close relatives was performed. The results, as shown in Table Table 10, indicate that candidates in municipalities that experienced a climate-related emergency provided 15.7% more income from their own resources compared to the mean of the own income provided by candidates in unaffected municipalities. These results are robust at the intensive margin but not for the extensive margin. Regarding contributions from close relatives, I find that the total amount of contributed money increased after experiencing a climate-related emergency Table 11. However, these results are not statistically significant.

Table 10: Effect of climate-related emergencies on political campaign income from candidates

	(1)	(2)	(3)	(4)
Ever treated x Post	14.323**	8.965*		
	(5.676)	(4.865)		
N Emergencies x Post			14.076**	6.895
			(6.400)	(5.398)
Post	15.824***	30.557**	20.268***	30.528**
	(3.740)	(12.980)	(2.888)	(12.456)
Controls	No	Yes	No	Yes
Control mean	56.977	56.977	56.977	56.977
Effect size	0.251	0.157	0.247	0.121
Municipalities x year	1052	1052	1052	1052
N(municipalities)	2104	2104	2104	2104

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Effect of climate-related emergencies on political campaign income from close relatives

	(1)	(2)	(3)	(4)
Ever treated x Post	6.418	4.102		
	(4.768)	(3.798)		
N Emergencies x Post			12.711	14.118
			(9.394)	(8.827)
Post	5.069*	34.562**	4.225	22.199**
	(2.641)	(13.550)	(2.955)	(10.790)
Controls	No	Yes	No	Yes
Control mean	23.803	23.803	23.803	23.803
Effect size	0.270	0.172	0.534	0.593
Municipalities x year	1052	1052	1052	1052
N(municipalities)	2104	2104	2104	2104

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

According to the research conducted by (Ruiz, 2017), private donations possess the potential to influence the allocation of resources and the quality of goods and services provided by contractors. Therefore, comprehending the dynamics of this type of political donation is important. To investigate the positive impact of climate-related emergencies on the monetary contributions by private donors, I analyzed whether the increase in donations was due to an increase in unique donors or if the shock actually discouraged some donors and made experienced donors give more generous contributions. The findings presented in Table 12 reveal that experiencing at least one climate-related emergency results in a decrease in the number of unique private donors. However, when

accounting for the number of emergencies, the effect on the number of donors is positive. Specifically, an increase of one standard deviation in the number of emergencies contributes to 4.9% of the average number of donors in unaffected municipalities. Furthermore, an additional standard deviation in the number of emergencies leads to a 0.273 increase in the number of donations, which is equivalent to 4.1% of the mean number of donations in unaffected municipalities. These effects are suggestive, they are not statistically significant. Additionally, as can be seen on Table 13, an additional standard deviation in the number of climate-related emergencies increased the average donation in 0.41 M COP, an effect that accounts for approximately 11.8% of the average donation in affected municipalities. However, this result is not robust when municipality-level controls are added.

Table 12: Effect of climate-related emergencies on political campaign income from private donors. Part I

	Unique donors				Number of donations			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ever treated x Post	-0.301	-0.250			-0.015	-0.097		
	(0.741)	(0.678)			(0.862)	(0.775)		
N Emergencies x Post			0.202	0.289			0.435	0.273
			(0.642)	(0.607)			(0.792)	(0.697)
Post	-0.586	-1.112	-0.899**	-1.654	-0.869	-1.384	-1.073**	-1.776
	(0.519)	(1.403)	(0.386)	(1.361)	(0.556)	(1.666)	(0.450)	(1.628)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Control mean	5.851	5.851	5.851	5.851	6.606	6.606	6.606	6.606
Effect size	-0.051	-0.043	0.035	0.049	-0.002	-0.015	0.066	0.041
Municipalities x year	1052	1052	1052	1052	1052	1052	1052	1052
N(municipalities)	2104	2104	2104	2104	2104	2104	2104	2104

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Effect of climate-related emergencies on political campaign income from private donors. Part II

	Average donation by donor			
	(1)	(2)	(3)	(4)
Ever treated x Post	0.900	0.574		
	(0.628)	(0.603)		
N Emergencies x Post			0.692***	0.416
			(0.254)	(0.264)
Post	0.495	2.821***	0.859***	2.848***
	(0.533)	(0.977)	(0.293)	(0.963)
Controls	No	Yes	No	Yes
Control mean	3.535	3.535	3.535	3.535
Effect size	0.255	0.162	0.196	0.118
Municipalities x year	1052	1052	1052	1052
N(municipalities)	2104	2104	2104	2104

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The findings presented in the preceding section suggest that municipalities that encountered climate-related emergencies witnessed a surge in campaign income secured by mayoral candidates, ranging from 11.9% to 22.3% in contrast to unaffected municipalities. Moreover, this increase was distributed among several candidates, with those ranking 2nd to 4th registering higher campaign income compared to their counterparts who occupied the same positions in unaffected municipalities. Simultaneously, the concentration of campaign entries was reduced in affected municipalities. The increase in campaign income can be attributed to candidates, their immediate relatives, and private donors. Candidates, in particular, augmented their own funding in municipalities that experienced climate-related emergencies. The campaign income from private donors also increased in municipalities affected by climate-related events, and this was facilitated by more and larger donations. The succeeding section will delve into the possible mechanisms underlying these outcomes. Firstly, I will present a plausible explanation for the income source that allowed for the increase in campaign income. Secondly, an attempt will be made to explore whether an investment or consumption motive was behind the increased contributions of private donors in affected municipalities.

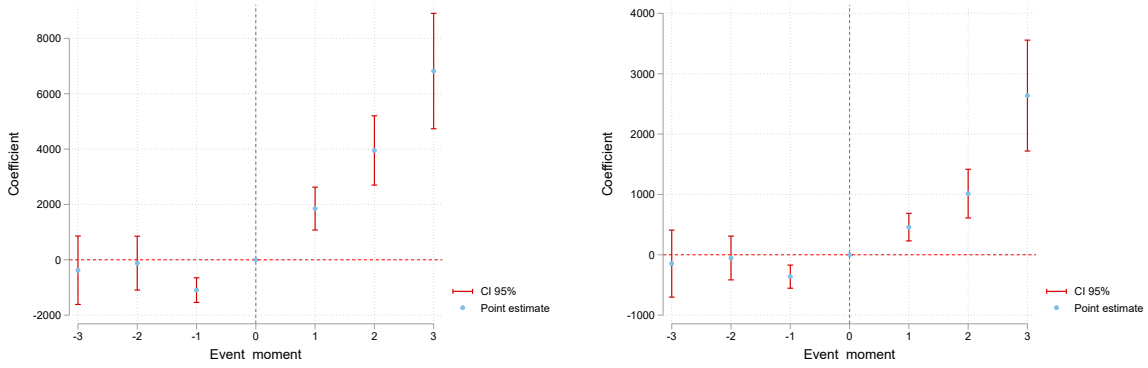
6 Possible mechanisms

In the previous section, I have presented evidence of the positive effect of climate-related emergencies on political campaign income at the municipality level. Through an event study analysis, as depicted in Panel A of Figure A2, it is evident that the first-time occurrence of such emergencies leads to a substantial increase in municipality income, with gains ranging from 4097 to 14546 M COP in each year post the event, as compared to the year the municipality first experienced the emergency (refer to Table A3). To better understand the source of this positive income shock, I draw

upon the work of (Roth & Wilson, 2023), who find that natural disasters in the United States tend to result in significant government aid which, in certain contexts, can stimulate employment and income growth in local areas via spending that is not financed through local taxation. In light of these insights, I investigate the effects of climate-related emergencies on capital transfers and the *Sistema General de Participaciones (SGP)* funds, which are the primary mechanisms used by the Colombian government to allocate resources to municipalities. One potential pathway through which public income, specifically transfers, can impact private income is via the provision of contracts aimed at providing humanitarian aid and engaging in reconstruction efforts following a natural disaster, as discussed in (Gallego, 2018) analysis of the 2011 La Niña phenomenon, the allocation of relief and reconstruction aid from the national government was primarily left to the discretion of mayors, who were responsible for allocating 47% of the resources. The discretion afforded to mayors in terms of aid income distribution can have significant effects, as (Garbiras, 2012) note that following the La Niña phenomenon in 2011, government officials authorized mayors to bypass established procurement processes in order to expedite the process, which in some cases resulted in less efficient contract execution.

Employing the specification outlined in Equation 3, I estimate the impact of climate-related emergencies on these outcomes. The results are shown in Figure 2 and on Table 14, it can be seen that capital transfers and SGP transfers substantially increased after a municipality experienced for the first time a climate-related emergency, with the magnitude of the effect ranging from 1850 M COP to 6818 for capital transfer income, and 458 M COP 2637 MCOP for SGP transfer. Although the results are statistically significant, it is important to note that the effects observed are suggestive rather than causal. This is primarily due to the fact that the parallel trends assumptions, which I elaborated on previously, do not hold for these outcomes. I must note that in the event study estimation described, I consider a municipality as "treated" based on the first time it experienced a climate-related emergency, not considering the month when the emergency occurred. Also, transfer from SGP is assigned annually at the beginning of each year. This difference in treatment and outcome timing could lead to less precise estimates.

Figure 2: Effect of climate-related emergencies on transfers received



(a) Capital transfers

(b) SGP transfers

Table 14: Effect of climate-related emergencies on transfers - Event study

	(1) Transfer income	(2) SGP transfers
Year -3	-376.630	-146.214
	(629.915)	(282.720)
Year -2	-121.744	-53.308
	(495.693)	(184.816)
Year -1	-1095.077***	-362.542***
	(226.545)	(97.527)
Year 1	1850.904***	458.195***
	(394.613)	(116.431)
Year 2	3951.538***	1013.683***
	(637.606)	(205.302)
Year 3	6818.952***	2637.994***
	(1062.777)	(468.184)
Municipalities x year	1059	1059
N(municipalities)	5280	5295

Standard errors in parentheses

Omitted year is the year the municipality experienced a climate-related emergency for the first time

Values in millions COP

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

I have provided suggestive evidence of the positive income shock at the municipality level, derived from experiencing a climate-related emergency, which could be the source of income that is destined to increase political campaign income. As previous results presented, the main sources of the increase in campaign income are the candidates and private donors. Now, I turn to investigate the possible motives behind the increased contributions from private donors. As explained by (Ansolabehere et al., 2003), political donors can either be motivated to contribute if they assign a consumption value associated with political participation or they can see their contributions as an investment, as they give to politics to influence government policies and regulations, leading to profits or other benefits.

I argue that if there are motives for political participation behind the increased campaign contributions, there should be an effect of natural disasters on other variables that capture actions toward political participation, such as the number of candidates that run for the mayoral elections and voter turnout. This is based on the hypothesis that exposure to natural disasters may make salient the importance of the role of the government and policies, which in turn might make citizens more politically engaged (Fair et al., 2017; Hajnal & Lewis, 2003; Kosec & Mo, 2017). I estimate the effects of experiencing climate-related emergencies on these outcomes following Equation 1 and Equation 2. Results are reported in Table 15, where I find no evidence of consumption motives driving the increase in campaign income.

I follow the approach of (Ruiz, 2017) to explore the notion that private contributors to election winners receive economic benefits in return for their contributions. To conduct this examination, I

Table 15: Effect of climate-related on political participation outcomes

	Voter turnout				Candidates on race			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ever treated x Post	-0.004	-0.005			0.096	0.113		
	(0.006)	(0.006)			(0.175)	(0.176)		
N Emergencies x Post			-0.000	-0.000			0.005	0.008
			(0.000)	(0.000)			(0.005)	(0.006)
Post	0.014***	0.016**	0.012***	0.015***	0.060	-0.044	0.075	-0.102
	(0.005)	(0.007)	(0.003)	(0.005)	(0.149)	(0.271)	(0.091)	(0.251)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Control mean	0.681	0.681	0.681	0.681	3.635	3.635	3.635	3.635
Effect size	-0.006	-0.007	-0.000	-0.000	0.026	0.031	0.001	0.002
Municipalities x year	1097	1097	1097	1097	1096	1096	1096	1096
N(municipalities)	2194	2194	2194	2194	2147	2147	2147	2147

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

utilize a dataset provided by the author that allows for linkage between campaign donors and contractors during the relevant mayoral incumbency periods in Colombia (2012-2015 and 2016-2019). Specifically, I estimate the effects of natural disasters on contracts awarded to donors who contributed privately to winning candidates by applying Equation 1 and Equation 2. The outcomes of my analysis are presented in Table 16, where it is observed that there are negative and modest effects on the number of contracts awarded to donors, both at the intensive and extensive margins. These effects range from 1.6% to 56.7% of the average number of contracts awarded to donors in unaffected municipalities. In terms of the contract value, the effect of experiencing at least one climate-related emergency is positive; however, when considering the number of occurred emergencies, the effect is negative and accounts for 40.3% of the mean contract value awarded to donors in unaffected municipalities. Nevertheless, these effects do not demonstrate statistical significance, and therefore, no evidence can be found to support or contradict investment motives underlying the increase in campaign income in affected municipalities.

Table 16: Effect of climate-related on contracts awarded to winning campaigns donors

	Number of contracts				Contract value			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ever treated x Post	-3.886	-2.836			526.271	922.410		
	(4.447)	(4.009)			(1906.788)	(1858.547)		
N Emergencies x Post			-0.299	-0.079			-192.762	-189.122
			(0.510)	(0.505)			(238.432)	(236.783)
Post	-0.200	-3.021	-2.935	-5.362	-890.431	-2582.301	-264.413	-1136.651
	(3.564)	(4.847)	(2.265)	(3.901)	(1735.743)	(3071.320)	(615.630)	(1923.762)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Control mean	4.998	4.998	4.998	4.998	469.527	469.527	469.527	469.527
Effect size	-0.777	-0.567	-0.060	-0.016	1.121	1.965	-0.411	-0.403
Municipalities x year	645	461	645	461	645	461	645	461
N(municipalities)	881	697	881	697	881	697	881	697

Standard errors in parentheses

Contracts value in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Although there is no clear evidence to support either consumption or investment motives, it seems that rent-seeking is the most probable motivation behind increased campaign contributions after climate-related emergencies. This is supported by growing evidence that in developing democracies, winning campaign donors receive preferential treatment in the public procurement process (Boas et al., 2014; Harding et al., 2023; Ruiz, 2017) and that this effect can persist over time, as private donors gain experience on how to gain benefits by donating to political campaigns (Rueda & Ruiz, 2022). Most importantly, for the Colombian case, (Ruiz, 2017) shows that electing a donor-funded politician more than doubles the probability of donors receiving contracts, these contracts being assigned numerous times under a minimum-value modality where there is more discretion on who gets a contract.

7 Conclusions

In this document, I investigated how climate-related events impact mayoral campaigns' income. Understanding the relationship between money and politics concerning climate-related events is important, given the mounting evidence regarding the pervasive influence money can have on the distribution of public resources. Previous research on natural disasters and politics has mainly examined the impact of these events on political participation and voting behavior. Studies have shown that natural disasters can both increase and decrease voter turnout, depending on various factors such as the effectiveness of the government's response and citizens' aspiration levels. Additionally, some studies suggest that relief funds provided by the government can be used to buy votes, but few have analyzed the effect of natural disasters on political campaign income.

My research indicates that municipalities hit by climate-related emergencies saw a considerable uptick in campaign income for their mayoral candidates, with an increase ranging from 11.9% to 22.3% compared to unaffected areas. This surge in funding was spread out among multiple candidates, with those ranking 2nd to 4th receiving more campaign income compared to their counter-

parts in non-affected municipalities. At the same time, the concentration of campaign entries decreased in affected areas. The increase in campaign income was driven by candidates themselves, their immediate relatives, and private donors. Specifically, candidates boosted their own funding in municipalities affected by climate-related emergencies, while campaign income from private donors also rose, thanks to larger and more frequent donations. This finding aligns with previous research (Liao & Ruiz Junco, 2022), showing that extreme weather events can lead to an increase in campaign contributions to the U.S. Democratic Party, especially in counties with anti-environment incumbent politicians.

Regarding the possible source of the positive effect on campaign income, I find that climate-related emergencies led to a substantial increase in municipality income, with gains ranging from 4097 to 14546 M COP in each year post the event. This positive income shock is attributed to the substantial increase in capital transfers and SGP transfers after a municipality experiences a climate-related emergency for the first time. However, it is important to note that the effects observed are suggestive rather than causal. I conducted further research to determine if the increase in campaign donations corresponds to consumption or investment motives, as described in (Ansolabehere et al., 2003), but no clear evidence was found to support either. However, I argue that rent-seeking is the most probable motivation behind increased campaign contributions following climate-related emergencies. This is supported by growing evidence that in developing democracies, donor-funded politicians give preferential treatment to their contributors, most commonly by assigning more contracts to donors.

The findings of this document provide insight into the interplay between climate-related events and political financing, revealing that the anticipated increase in frequency and severity of natural disasters in Colombia may compromise the allocation of public resources and the implementation of effective mitigation strategies. Due to the absence of conclusive evidence on the precise mechanisms underlying the observed increase in campaign contributions subsequent to climate-related events, further investigation is needed to determine whether this is due to politicians awarding contracts related to reconstruction and aid to donors or if donors value the environmental positions of politicians in mayoral elections, a factor that was not explored in this analysis.

References

Acevedo, K. M., & Bornacelly, I. D. (2014, July). *Panel Municipal del CEDE* (Documentos CEDE No. 12223). Universidad de los Andes, Facultad de Economía, CEDE. https://ideas.repec.org/p/col/000089/012223.html

Ansolabehere, S., de Figueiredo, J. M., & Snyder, J., James M. (2003). Why is there so little money in u.s. politics? *Journal of Economic Perspectives*, *17*(1), 105–130. https://doi.org/10.1257/089533003321164976

Arvate, P. R., Barbosa, K., & Fuzitani, E. (2013, December). *Campaign donation and government contracts in Brazilian states* (Textos para discussão No. 336). FGV EESP - Escola de Economia de São Paulo, Fundação Getulio Vargas (Brazil). https://ideas.repec.org/p/fgv/eesptd/336.html

Barber, M. (2016). Donation Motivations: Testing Theories of Access and Ideology. *Political Research Quarterly*, *69*(1), 148–159. https://doi.org/10.1177/1065912915624164

Boas, T. C., Hidalgo, F. D., & Richardson, N. P. (2014). The Spoils of Victory: Campaign Donations and Government Contracts in Brazil. *The Journal of Politics*, *76*(2), 415–429. https://doi.org/10.1017/S002238161300145X

Bonica, A. (2013). Ideology and Interests in the Political Marketplace. *American Journal of Political Science*, *57*(2), 294–311. https://doi.org/10.1111/ajps.12014

Bonica, A., & Rosenthal, H. (2015, September). The Wealth Elasticity of Political Contributions by the Forbes 400. https://doi.org/10.2139/ssrn.2668780

Botero, F., & Alvira, D. (2012). Fulano de tal va por aval. desconexión entre los niveles nacionales y locales de los partidos políticos en colombia. In L. Wills-Otero & M. Batle (Eds.), *Política y territorio. análisis de las elecciones subnacionales de colombia, 2011*. PNUD-IDEA Internacional-NIMD.

Brunell, T. L. (2005). The Relationship Between Political Parties and Interest Groups: Explaining Patterns of PAC Contributions to Candidates for Congress. *Political Research Quarterly*, *58*(4), 681–688. https://doi.org/10.1177/106591290505800415

Casas-Zamora, K., & Falguera, E. (2016). *Political Finance and the Equal Participation of Women in Colombia: A Situation Analysis* (tech. rep.). Stockholm: International Institute for Democracy and Electoral Assistance.

Cole, S., Healy, A., & Werker, E. (2012). Do voters demand responsive governments? Evidence from Indian disaster relief. *Journal of Development Economics*, *97*(2), 167–181. https://doi.org/10.1016/j.jdeveco.2011.05.005

Cooperman, A. (2022). (Un)Natural Disasters: Electoral Cycles in Disaster Relief. *Comparative Political Studies*, *55*(7), 1158–1197. https://doi.org/10.1177/00104140211047410

Dargent, E., & Muñoz, P. (2011). Democracy against Parties? Party System Deinstitutionalization in Colombia. *Journal of Politics in Latin America*, *3*(2), 43–71. https://doi.org/10.1177/1866802X1100300202

Fair, C. C., Kuhn, P. M., Malhotra, N., & Shapiro, J. N. (2017). Natural Disasters and Political Engagement: Evidence from the 2010–11 Pakistani Floods. *Quarterly Journal of Political Science*, *12*(1), 99–141. https://doi.org/10.1561/100.00015075

FEMA. (2023). Natural Risk Index - Natural Hazards. https://hazards.fema.gov/nri/natural-hazards

Fouirnaies, A., & Hall, A. B. (2018). How Do Interest Groups Seek Access to Committees? *American Journal of Political Science*, *62*(1), 132–147.

Gallego, J. (2018). Natural disasters and clientelism: The case of floods and landslides in Colombia. *Electoral Studies*, *55*, 73–88. https://doi.org/10.1016/j.electstud.2018.08.001

Garbiras, N. (2012). *Desastres naturales y corrupción - el efecto de la ola invernal de 2010/2011 en colombia, en el (mal) uso de los recursos públicos a nivel municipal* (tech. rep.). Universidad de los Andes. https://repositorio.uniandes.edu.co/entities/publication/5a3ffb7e-391d-4924-a7eb-d009d5eece00

Garrett, T. A., & Sobel, R. S. (2003). The Political Economy of FEMA Disaster Payments. *Economic Inquiry*, *41*(3), 496–509. Retrieved November 12, 2023, from https://search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=eoh&AN=0660533&lang=es&site=eds-live&scope=site&custid=s6670599

Gordon, S. C., Hafer, C., & Landa, D. (2007). Consumption or Investment? On Motivations for Political Giving. *The Journal of Politics*, *69*(4), 1057–1072. https://doi.org/10.1111/j.1468-2508.2007.00607.x

Gulzar, S., Robinson, T. S., & Ruiz, N. A. (2022). How Campaigns Respond to Ballot Position: A New Mechanism for Order Effects. *The Journal of Politics*, *84*(2), 1256–1261. https://doi.org/10.1086/715594

Gulzar, S., Rueda, M. R., & Ruiz, N. A. (2021). Do Campaign Contribution Limits Curb the Influence of Money in Politics. *American Journal of Political Science*. https://doi.org/10.1111/ajps.12596

Hajnal, Z. L., & Lewis, P. G. (2003). Municipal Institutions and Voter Turnout in Local Elections. *Urban Affairs Review*, *38*(5), 645–668. https://doi.org/10.1177/1078087403038005002

Harding, R., Prem, M., Ruiz, N. A., & Vargas, D. L. (2023). Buying a Blind Eye: Campaign Donations, Regulatory Enforcement, and Deforestation. *American Political Science Review*, 1–19. https://doi.org/10.1017/S0003055423000412

Healy, A., & Malhotra, N. (2009). Myopic Voters and Natural Disaster Policy. *American Political Science Review*, *103*(3), 387–406. https://doi.org/10.1017/S0003055409990104

Hill, S. J., & Huber, G. A. (2017). Representativeness and Motivations of the Contemporary Donorate: Results from Merged Survey and Administrative Records. *Political Behavior*, *39*(1), 3–29. https://doi.org/10.1007/s11109-016-9343-y

Kalla, J., & Broockman, D. E. (2016). Campaign Contributions Facilitate Access to Congressional Officials: A Randomized Field Experiment. *American Journal of Political Science*, *60*(3), 545–558. https://doi.org/10.1111/ajps.12180

Kosec, K., & Mo, C. H. (2017). Aspirations and the Role of Social Protection: Evidence from a Natural Disaster in Rural Pakistan. *World Development*, *97*, 49–66. https://doi.org/10.1016/j.worlddev.2017.03.039

Lee, H., & Romero, J. (Eds.). (2023). *Ipcc, 2023: Summary for policymakers* (Vol. 10867). IPCC.

Liao, Y., & Ruiz Junco, P. (2022). Extreme weather and the politics of climate change: A study of campaign finance and elections. *Journal of Environmental Economics and Management*, *111*, 102550. https://doi.org/10.1016/j.jeem.2021.102550

McConnell, B. (2023). What's logs got to do with it: On the perils of log dependent variables and difference-in-differences.

Milanese, J. P., & Albarracín, J. (2022). Electoral decentralisation with weak parties. analysis of colombia's subnational elections. *Regional & Federal Studies*, *32*(4), 471–483. https://doi.org/10.1080/13597566.2022.2028279

MOE. (2018). *Democracias Empeñadas*. Misión de Observación Electoral.

Oliver, A. J., & Reeves, A. (2015, May). The Politics of Disaster Relief. In R. A. Scott & S. M. Kosslyn (Eds.), *Emerging Trends in the Social and Behavioral Sciences* (1st ed., pp. 1–8). Wiley. https://doi.org/10.1002/9781118900772.etrds0258

Pachón, M., & Sánchez, F. J. (2014). Base de datos sobre resultados electorales cede, 1958-2011. http://hdl.handle.net/1992/8503

Raga, J., & Selingson, M. (2011). *Cultura Política de la Democracia en Colombia, 2011. Actitudes Democráticas en la Sucesión* (tech. rep.). Observatorio de la Democracia. Universidad de los Andes.

Roth, B., & Wilson, D. (2023). The local economic impact of natural disasters. *Federal Reserve Bank of San Francisco, Working Paper Series*.

Rudolph, L., & Kuhn, P. M. (2018). Natural Disasters and Political Participation: Evidence from the 2002 and 2013 Floods in Germany. *German Politics*, *27*(1), 1–24. https://doi.org/10.1080/09644008.2017.1287900

Rueda, M. R., & Ruiz, N. A. (2022). How Do Electoral Outcomes Affect Campaign Contributions? The Roles of Personal Loyalty and Investment Motives. *Working paper*. https://www.dropbox.com/s/is00murw518rls5/Rueda_Ruiz_Electoral_Outcomes.pdf?dl=0 (accessed: 09.10.2023).

Ruiz, N. A. (2017). The Power of Money. The Consequences of Electing a Donor Funded Politician. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3123592

Sances, M. W., & You, H. Y. (2018). Income shocks and inequality in political participation : Evidence from the us shale boom. https://api.semanticscholar.org/CorpusID:180262226

Sinclair, B., Hall, T. E., & Alvarez, R. M. (2011). Flooding the Vote: Hurricane Katrina and Voter Participation in New Orleans. *American Politics Research*, *39*(5), 921–957. https://doi.org/10.1177/1532673x10386709

Stratmann, T. (2005). Some talk: Money in politics. A (partial) review of the literature. *Public Choice*, *124*(1-2), 135–156. https://doi.org/10.1007/s11127-005-4750-3

The Wolrd Bank Colombia. (2012). Análisis de la gestión del riesgo en colombia: Un aporte para la construcción de políticas públicas (A. Campos, N. Holm-Nielsen, C. Díaz, D. Rubiano, C. Costa, F. Ramírez, & E. Dickson, Eds.). https://documents1.worldbank.org/curated/en/671321468026993367/pdf/701030ESW0P1290ESTI0N0DEL0RIESGOweb.pdf

The World Bank Group. (2023a). Climate Change Knowledge Portal. https://climateknowledgeportal.worldbank.org/country/colombia/vulnerability

The World Bank Group. (2023b). Climate Risk Profile: Colombia (2023). https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/16698-WB_Colombia%20Country%20Profile-WEB.pdf (accessed: 09.10.2023).

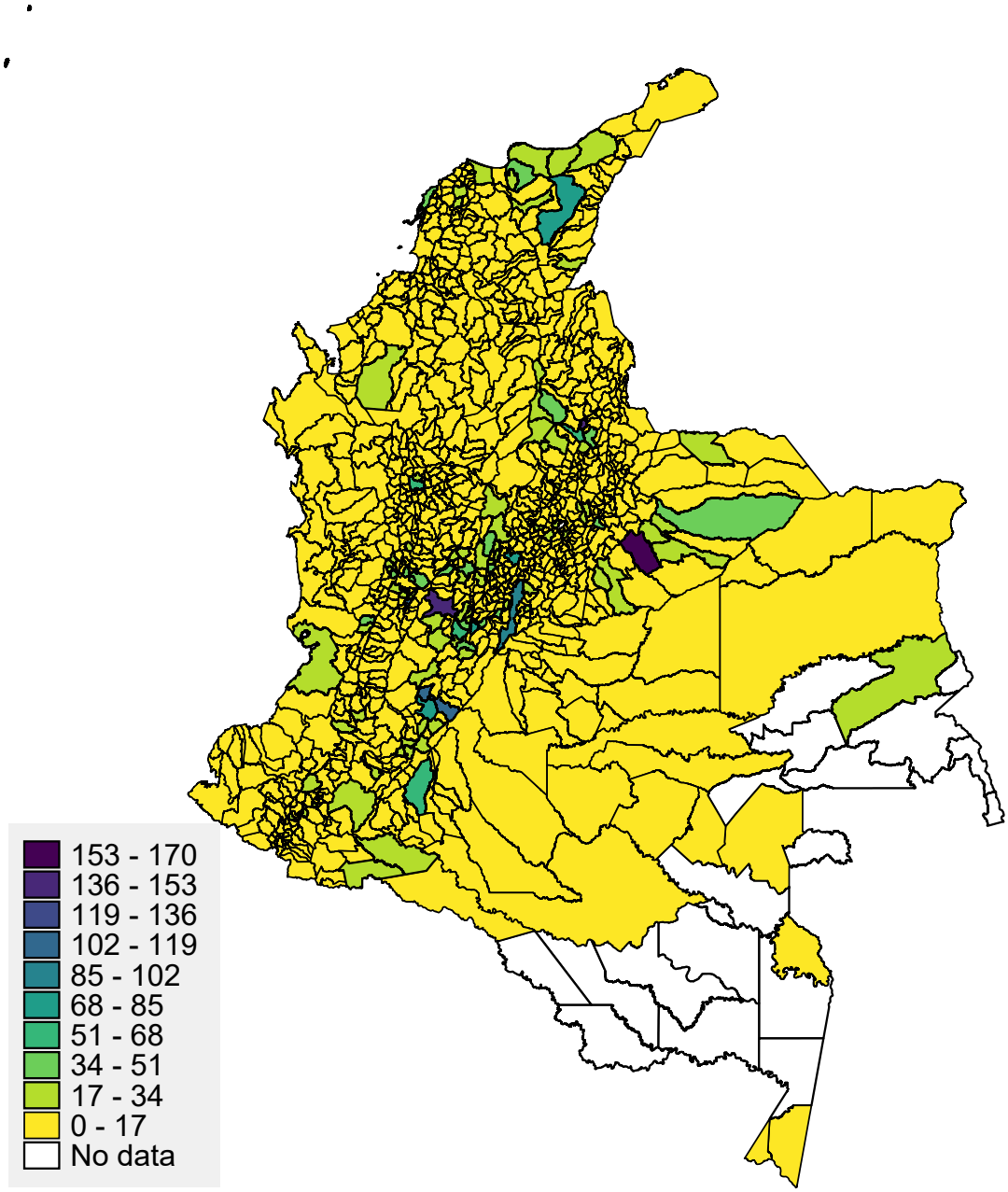
Transparencia por Colombia. (2016). Análisis Cuentas Claras Elecciones 2015. https://transparenciacolombia.org.co/informe-cuentas-claras-2015/

Transparencia por Colombia. (2012). Análisis Cuentas Claras Elecciones Territoriales 2011. https://transparenciacolombia.org.co/analisis-cuentas-claras-elecciones-territoriales-2011/

A Additional tables and figures

Table A1: Campaings income codebook

Revenues	
101	Credits or contributions from the income of the candidates, or direct relatives
102	Contributions, grants, and loans, in cash or kind, by private donors
103	Credits obtained in financial institutions to finance the campaign
104	Income originating from public events or publications by the party or movement
105	State funding
106	Political parties direct financing



Source: UNGRD annual emergency reports
Own elaboration.

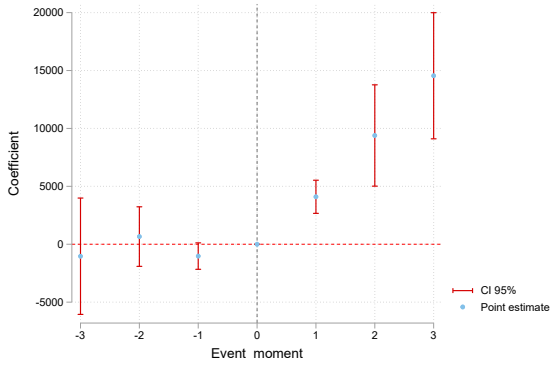
Figure A1: Spatial distribution of exposure of climate-related emergencies (No. Of emergencies)

Table A2: Summary statistics at the candidate level in 2011

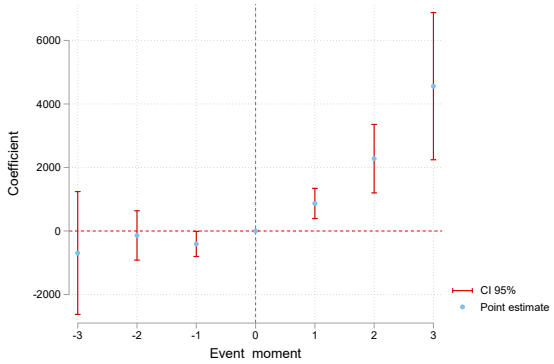
	Sum	Mean	SD	Min	Max	N
A. Campaign income						
Total campaign income	137242	35.77	85.07	0	1,640	3,837
Average income entry	40,890	10.66	12.30	0	160	3,837
B. Shares of income by source						
Candidate or direct relatives	3,068	0.80	0.31	0	1	3,837
Private donors	601	0.16	0.27	0	1	3,837
Credits	45	0.01	0.08	0	1	3,837
Public events	49	0.01	0.08	0	1	3,837
State funding	3	0.00	0.02	0	1	3,837
Political party	72	0.02	0.10	0	1	3,837
C. Income from candidate and direct relatives						
Income from the candidate or direct relatives	84,082	21.91	34.33	0	775	3,837
Number of entries	8,713	2.27	2.48	0	33	3,837
Average entry value	44,350	11.56	13.88	0	225	3,837
Number of entries by the candidate	5,420	1.41	1.61	0	33	3,837
Number of entries by direct relatives	3,318	0.86	1.83	0	33	3,837
Average entry value over contributors	57,255	14.92	23.37	0	775	3,837
D. Income from private donors						
Income from private donors	39,429	10.28	55.03	0	1,270	3,837
Number of donations	7,788	2.03	6.35	0	100	3,837
Average donation	7,169	1.87	4.79	0	100	3,837
Number of donors	6,910	1.80	5.47	0	98	3,837
Average donation over donors	7,884	2.05	5.91	0	150	3,837

Campaign incomes in millions of colombian pesos

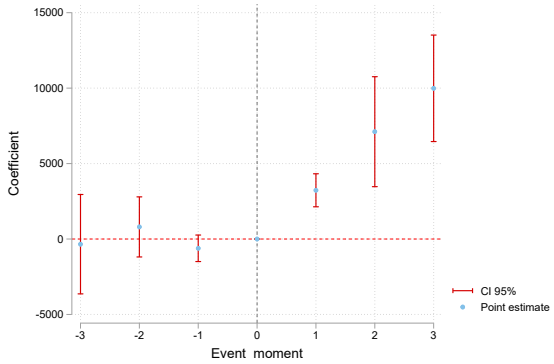
Figure A2: Effect of climate-related emergencies on municipalities income - Event study



(a) Total income



(b) Current income



(c) Capital income

Table A3: Effect of climate-related emergencies on municipalities income - Event study

	(1) Total income	(2) Current income	(3) Capital income
Year -3	-1035.132	-692.311	-342.821
	(2559.804)	(985.463)	(1678.256)
Year -2	661.979	-140.343	802.322
	(1310.286)	(395.944)	(1014.562)
Year -1	-1022.884*	-407.904**	-614.979
	(581.144)	(201.332)	(447.608)
Year 1	4097.413***	868.047***	3229.365***
	(729.286)	(241.751)	(557.586)
Year 2	9390.221***	2277.334***	7112.887***
	(2228.966)	(549.243)	(1856.932)
Year 3	14546.857***	4559.600***	9987.257***
	(2774.673)	(1180.559)	(1798.387)
Municipalities x year	1059	1059	1059
N(municipalities)	5280	5280	5280

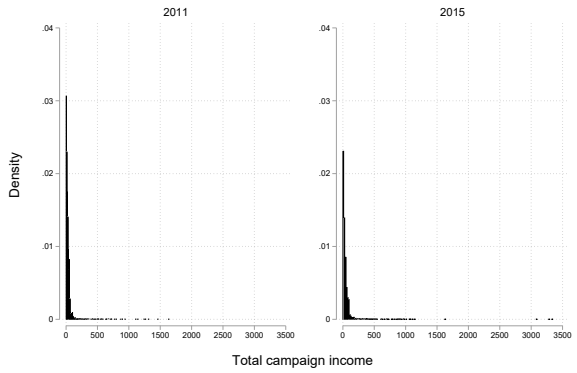
Standard errors in parentheses

Omitted year is the year the municipality experienced a climate-related emergency for the first time

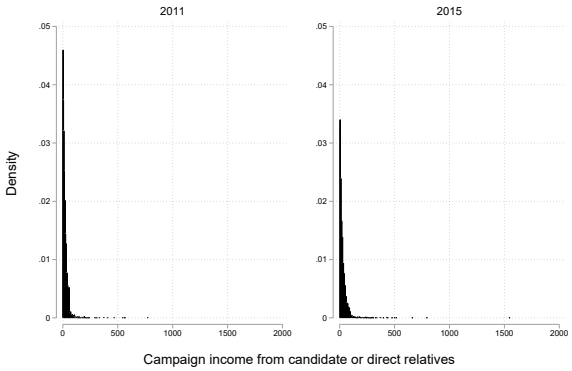
Values in millions COP

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

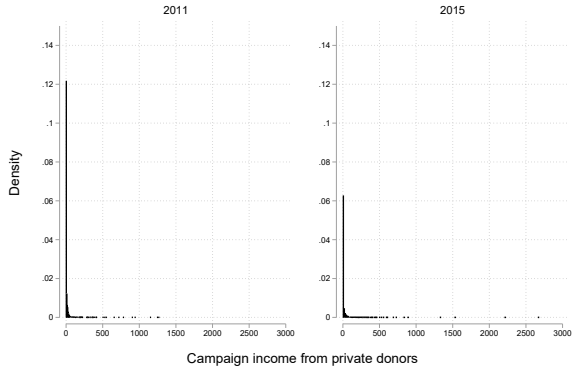
Figure A3: Main outcome variables distributions



(a) Total campaign income



(b) Campaign income from the candidate and direct relatives



(c) Campaign income from private donors

Table A4: Effect of climate-related emergencies on political campaign income transformations without controls

	Ln(campaigns income)	Trimmed campaigns income				
	(1)	(2) (p1, p99)	(3) (p2, p98)	(4) (p3, p97)	(5) (p4, p96)	(6) (p5, p95)
Ever treated x Post	0.016	27.082***	15.942**	14.064**	11.063*	11.032*
	(0.058)	(8.861)	(7.331)	(6.145)	(5.954)	(6.039)
Post	0.300***	27.488***	28.001***	25.699***	26.537***	26.939***
	(0.050)	(5.426)	(5.596)	(4.624)	(4.668)	(4.859)
Controls	No	No	No	No	No	No
Control mean	18.190	108.326	102.492	97.874	95.302	93.252
Effect size	0.001	0.250	0.156	0.144	0.116	0.118
Municipalities x year	1052	1043	1035	1022	1013	998
N(municipalities)	2104	2065	2023	1981	1939	1894

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A5: Effect of climate-related emergencies on political campaign income transformations with controls

	Ln(campaigns income)	Trimmed campaigns income				
	(1)	(2) (p1, p99)	(3) (p2, p98)	(4) (p3, p97)	(5) (p4, p96)	(6) (p5, p95)
Ever treated x Post	0.014	6.111	6.881	8.049	6.802	6.600
	(0.058)	(6.409)	(6.606)	(5.670)	(5.720)	(5.807)
Post	0.308***	18.501	30.317*	33.366***	25.616*	16.082
	(0.077)	(18.441)	(16.155)	(12.050)	(14.409)	(10.951)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	18.190	108.326	102.492	97.874	95.302	93.252
Effect size	0.001	0.056	0.067	0.082	0.071	0.071
Municipalities x year	1052	1043	1035	1022	1013	998
N(municipalities)	2104	2065	2023	1981	1939	1894

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A6: Effect of climate-related emergencies on political campaign income from credits and public events

	Credits				Public events			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ever treated x Post	0.674	-2.742			-0.325	-0.279		
	(3.130)	(2.497)			(1.767)	(1.682)		
N Emergencies x Post			3.821	-4.232			0.589	1.052
			(6.028)	(2.649)			(2.620)	(2.700)
Post	1.574	-7.977	0.385	-5.576	0.475	2.194	-0.028	0.768
	(1.991)	(6.545)	(1.517)	(5.612)	(1.271)	(4.611)	(0.989)	(3.853)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Control mean	5.179	5.179	5.179	5.179	3.602	3.602	3.602	3.602
Effect size	0.130	-0.529	0.738	-0.817	-0.090	-0.078	0.164	0.292
Municipalities x year	1052	1052	1052	1052	1052	1052	1052	1052
N(municipalities)	2104	2104	2104	2104	2104	2104	2104	2104

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A7: Effect of climate-related emergencies on political campaign income from state funding and political parties

	State funding				Political party			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ever treated x Post	-0.149	-0.119			-0.657	0.182		
	(0.250)	(0.135)			(1.123)	(0.791)		
N Emergencies x Post			-0.534	-0.653			-1.114	1.153
			(0.883)	(0.901)			(2.269)	(1.469)
Post	-0.000	-0.578	0.125	0.055	0.198	4.860*	0.201	3.718
	(0.000)	(0.741)	(0.261)	(0.621)	(0.607)	(2.615)	(0.628)	(2.295)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Control mean	0.178	0.178	0.178	0.178	2.976	2.976	2.976	2.976
Effect size	-0.840	-0.671	-3.003	-3.676	-0.221	0.061	-0.374	0.387
Municipalities x year	1052	1052	1052	1052	1052	1052	1052	1052
N(municipalities)	2104	2104	2104	2104	2104	2104	2104	2104

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A8: Effect of climate-related emergencies on political campaign income from candidates and close relatives transformations without controls

	Ln(income from candiate and direct relatives)	Trimmed income from candiate and direct relatives				
	(1)	(2) (p1, p99)	(3) (p2, p98)	(4) (p3, p97)	(5) (p4, p96)	(6) (p5, p95)
Ever treated x Post	0.082	14.572**	10.699*	10.238**	9.576**	8.509*
	(0.077)	(6.239)	(5.861)	(4.972)	(4.835)	(4.870)
Post	0.305***	21.685***	21.978***	20.598***	20.096***	20.229***
	(0.061)	(4.610)	(4.774)	(3.903)	(3.852)	(3.946)
Controls	No	No	No	No	No	No
Control mean	17.872	75.861	73.748	71.934	70.778	69.741
Effect size	0.005	0.192	0.145	0.142	0.135	0.122
Municipalities x year	1052	1048	1038	1031	1020	1011
N(municipalities)	2104	2065	2020	1979	1939	1898

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A9: Effect of climate-related emergencies on political campaign income from candidates and close relatives transformations with controls

	Ln(income from candiate and direct relatives)	Trimmed income from candiate and direct relatives				
	(1)	(2) (p1, p99)	(3) (p2, p98)	(4) (p3, p97)	(5) (p4, p96)	(6) (p5, p95)
Ever treated event x post	0.083	8.871	7.658	9.481*	9.201*	8.344*
	(0.081)	(5.883)	(5.992)	(4.921)	(4.858)	(4.925)
Post	0.241**	45.103***	38.727***	29.191***	26.106***	24.611***
	(0.116)	(14.253)	(11.678)	(8.926)	(8.373)	(8.478)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	17.866	75.388	73.280	71.522	70.405	69.367
Effect size	0.005	0.118	0.105	0.133	0.131	0.120
Municipalities x year	1067	1062	1052	1043	1032	1023
N(municipalities)	2119	2079	2034	1991	1951	1910

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A10: Effect of climate-related emergencies on political campaign income from private donors transformations without controls

	Ln(income from private donors)	Trimmed income from private donors				
	(1)	(2) (p1, p99)	(3) (p2, p98)	(4) (p3, p97)	(5) (p4, p96)	(6) (p5, p95)
Ever treated x Post	0.543	10.519**	6.392	1.884	0.722	0.729
	(0.933)	(4.951)	(4.128)	(3.344)	(2.822)	(2.562)
Post	-1.414*	4.022	4.022	5.067*	4.281*	3.412
	(0.815)	(3.066)	(3.074)	(2.710)	(2.347)	(2.139)
Controls	No	No	No	No	No	No
Control mean	11.788	22.671	19.381	17.523	16.471	15.601
Effect size	0.046	0.464	0.330	0.107	0.044	0.047
Municipalities x year	1052	1044	1039	1032	1024	1016
N(municipalities)	2104	2084	2063	2040	2020	1998

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A11: Effect of climate-related emergencies on political campaign income from private donors transformations with controls

	Ln(income from private donors)	Trimmed income from private donors				
	(1)	(2) (p1, p99)	(3) (p2, p98)	(4) (p3, p97)	(5) (p4, p96)	(6) (p5, p95)
Ever treated x Post	0.515	2.036	0.921	-1.570	-1.699	-0.995
	(0.945)	(4.067)	(3.874)	(3.166)	(2.745)	(2.574)
Post	-1.368	6.940	4.684	0.721	-3.196	0.093
	(1.223)	(13.811)	(9.400)	(5.454)	(4.433)	(4.651)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	11.788	22.671	19.381	17.523	16.471	15.601
Effect size	0.044	0.090	0.048	-0.090	-0.103	-0.064
Municipalities x year	1052	1044	1039	1032	1024	1016
N(municipalities)	2104	2084	2063	2040	2020	1998

Standard errors in parentheses

Campaign income in millions of colombian pesos

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$