

There Is Something in the Water: The Effects of a Bad Government on Voter Turnout

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Abstract

In April, 2014 the residents of Flint City, Michigan, U.S.A, saw their everyday water supply switched from the Lake Huron, 70 miles away, to the nearby Flint River, a result of the city's and the State's efforts to cut back on Flint's fiscal deficit and deliver fiscal stability to the city's accounts. However, this proved to be a highly questionable decision as the waters of Flint River were highly polluted and were not treated accordingly. Thus, when this untreated water began flowing into the city and circulated through an aging pipeline infrastructure, extremely high concentrations of lead and other pernicious bacteria formed and households and businesses began to consume contaminated water which could provoke severe health hazards with both short and long term impacts. I leverage this unique natural experiment, which offers a clear-cut instance of a poor Administration regardless of political subjectivity, termed in the media as the Water Crisis, to assess whether the residents of Flint City, in the midst of an unprecedented crisis, were more or less willing to participate in the democratic process. Using an event study differences-in-differences estimator I then find evidence of a sizeable relative decrease in voter turnout (25% percent on average in the 2014, 2016, 2018 and 2020 elections) in Flint City since the start of the Crisis.

1 Introduction

On April 25, 2014, the residents of Flint, Michigan, United States, began consuming contaminated water. As part of a package of measures to address its fiscal deficit, the city government decided to change its water source. Historically, the water supply came from Lake Huron through a treatment plant in Detroit, located approximately 120 kilometers away from the city. In order to become independent from Detroit and save fiscal resources in the medium and long term, the city opted to join a project that would establish its own connection to the lake, which surrounds the city to the north, northeast, and east at a similar distance as Detroit. During the estimated two-year construction period, the Flint River, which runs through the city, would be used as the interim water source.

Flint is one of the poorest cities in Michigan and the United States. With the decline of the automotive industry, which historically served as the city's main economic activity, particularly with General Motors, Flint has experienced significant socioeconomic setbacks since the 1970s. To illustrate this, in the late 1970s, General Motors employed 80,000 individuals in its Flint factory, whereas by 2010, the number had dropped to less than 8,000. According to data from the U.S. Census Bureau, between 2016 and 2020, half of the households in Flint had incomes of less than \$30,000, while the median income for the state of Michigan was approximately \$60,000, and for the entire United States, \$70,000. Moreover, the poverty rate in Flint significantly exceeds that of the state, with 37% compared to 13%, while the national average stands at 11%. Flint is also one of the most dangerous cities in the United States. In 2011, The New York Times referred to it as "*Murdertown, USA*", and according to FBI statistics, there were nearly 3,000 violent crimes in the city in 2012, the highest per capita for cities with over 100,000 residents.

The event that later became known as the Flint Water Crisis was a singular incident that gained national prominence. It caught the attention of President Obama, who visited the city and allocated \$5 million in funds in 2016 to assist with the situation. The crisis resulted in fifteen officials being prosecuted, including two for involuntary manslaughter. It sparked protests, led to compensations of nearly \$700 million for the most affected individuals, prompted a declaration of a state of emergency in the city, and initiated an ambitious plan for a complete overhaul of the city's water infrastructure.

Why did this particular administrative decision have such a significant impact compared to others? The water from the Flint River had a problem: although there was a functioning

treatment plant to purify the water, the necessary anti-corrosion treatments had not been applied before its use. Due to the decaying infrastructure, when the new water began flowing through the city, the old lead pipes started leaching particles, leading to an unprecedented increase in the levels of lead in the water. According to the Center for Disease Control and the Environmental Protection Agency, lead ingestion has a particularly detrimental effect on children as it is a significant determinant of the development of both long-term and immediate health issues such as Alzheimer's (Wu et al., 2008), anemia, hearing problems, behavioral disorders, and notably impacts cognitive development, learning ability, and physical growth, resulting in stunted growth.

Additionally, coliform bacteria, including the common *Escherichia coli*, as well as legionella, which causes intestinal problems, were found in the water. When coliform bacteria were detected (the legionella outbreak was only acknowledged by authorities towards the end of 2015), city officials decided to introduce chlorine to kill the bacteria. However, this led to the formation of new harmful elements known as trihalomethanes, which are carcinogenic.

The confluence of these factors, including the contamination of water with lead and the presence of harmful bacteria, resulted in the Flint Water Crisis garnering significant attention and outcry. The severe health implications, particularly for children, along with the negligent handling of the situation by authorities, contributed to the widespread concern and the subsequent legal actions, protests, financial compensations, and the commitment to revitalize the city's water infrastructure.

A simple administrative decision, one among many that sought to reduce the city's dire financial situation, led to a humanitarian catastrophe. While deciding if a government is bad or good is endogenous to people's political preferences and their willingness or ability and opportunity to acquire information and interpret it, being exposed to harmful and even deadly pathogens and substances, via a key resource such as water, is against anyone's interest, regardless of their political beliefs. I will then leverage this natural experiment in bad governing to study the effects of a poor Administration on voter turnout.

2 The Water Crisis¹

In November 2011, the State of Michigan, following an audit that revealed a \$25 million deficit in the city of Flint, appointed an emergency manager² for the second time in the century to rectify the city's financial situation. One notable issue was the high cost that the city had to bear for its water supply from Detroit, which had been providing water to Flint since 1967. In an effort to save resources, in 2013, the emergency manager, along with the city's administrative council, decided to join a project called the Karegnondi Water Authority -a corporation that brought together the counties of Genesee, with Flint as the county seat, Lapeer, and Salinac. This initiative aimed to establish a direct connection between Flint and Lake Huron, bypassing the need for water from Detroit. After the project was approved in early September that year, the contract with Detroit was terminated, and temporary connections with the Flint River, which runs through the city, began to be built.

On April 25, 2014, just a few months after the construction work commenced, the city of Flint started receiving water from its own river. By August, the city government notified its citizens that the water was contaminated with coliform bacteria and issued a recommendation to boil the water before use. However, residents of Flint had been alerting and strongly complaining to the authorities since the switch to Flint River water began, as they noticed a foul odor and brown color in the water. The boiling recommendation was lifted a few days later, as the authorities assured the public that no bacteria were being detected in the water due to the chlorination treatment (which, as noted, led to unforeseen problems with the formation of trihalomethanes).

In January 2015, in response to complaints, demands and protests from the citizens of Flint about water contamination and mounting public pressure, the city of Detroit itself offered to reconnect Flint to its water system for free. However, both the emergency manager and the administrative council decided to reject the offer, stating that the cost of the contract would be prohibitive for the city and that the river water was safe. The following month, a resident of Flint filed a complaint with the Environmental Protection Agency (EPA) and submitted a water sample from her home for analysis, which revealed lead levels of 104 parts per billion (ppb), exceeding the maximum allowable limit of 15 ppb. In a subsequent analysis of another sample, it was found that lead levels in the water had risen to nearly 400 ppb.

¹This section is based on Clark (2018) and news coverage from The Washington Post, the New York Times and other leading and reputable journalistic sources.

²Until late 2015, when the State intervention ended, four different emergency managers were appointed to Flint.

By late March, the administrative council finally decided to accept the offer to reconnect to Detroit's water system. However, the emergency manager rejected the initiative, declaring that Detroit water was no safer than Flint's (even though the city had been receiving water from Detroit without any problems for 50 years).

In June, a private study conducted by Virginia Tech University for the EPA revealed that water in four tested households had lead levels exceeding 13,000 ppb, while the EPA classifies water contaminated with over 5,000 ppb of lead as hazardous waste. In July, after the results of this study were leaked, a representative from the Department of Environmental Quality in Flint claimed that the problem was limited to very few homes and stated that "anyone concerned about lead in the water can relax." During the same month, the mayor of the city, Dayne Walling (first elected in 2009 and reelected in 2011), appeared on camera drinking tap water to assure the public that there was no problem.

Only in September 2015, a new preliminary study conducted by Virginia Tech revealed that at least 40% of households were using water contaminated with extremely high levels of lead. The study concluded that the water from the Flint River was 19 times more corrosive than that from Lake Huron. At that time, the researchers involved in the project issued a recommendation for the city to declare the water unfit for drinking or cooking. In the same month, a study by clinical researchers at Hurley Medical Center revealed that the number of children exhibiting symptoms of lead contamination had doubled since the switch in water source.

By mid-October, the governor of Michigan finally released funds for Flint to reconnect to the Detroit treatment plant, and the following day, Flint began receiving water from Lake Huron once again.

Thus, for a year and a half, the residents of Flint were exposed to a severe threat to their health. By the end of the year, a state of emergency was declared in the city, and in the subsequent years up to the present, Flint's residents have filed various complaints, lawsuits, and demands for compensation, and local, state, and federal officials, including those from the EPA, have been brought to court for their roles in this humanitarian crisis.

3 Determinants of Voting

In the field of economics and political science, there are two contrasting hypotheses regarding the effects of government actions on electoral participation. On one hand, there is the mobilization hypothesis, and on the other hand, the withdrawal hypothesis (Linge & Martínez i Coma, 2022). So far, there is no compelling evidence in favor of either hypothesis, especially since the literature primarily focuses on correlations related to the determinants of voting, and as far as I have explored, no natural experiment like the Flint Water Crisis has been utilized to test either hypothesis.

Moreover, there is a substantial body of research that examines which regulatory regimes result in higher electoral participation, but again, this is based on correlations rather than causality. Additionally, the findings of these studies do not come as a surprise. A meta-analysis of 130 peer-reviewed studies on the determinants of electoral participation finds that there is higher participation in countries with mandatory voting, in smaller countries, and in elections that are deemed significant (Stockemer, 2016). However, there is no conclusive evidence on how other factors such as electoral systems, the number of parties, economic development, inequality, or the competitiveness of an election in advance affect participation (Stockemer, 2016). Therefore, these results indicate that the determinants of voting are more complex than what the prevailing theory in the field of political behavior suggests and that participation largely depends on each specific context, without discernible macro trends (Stockemer, 2016).

Given the magnitude of scandal generated by the Flint Water Crisis, the erosion of trust in institutions and politicians (Morckel & Terzano, 2018), coupled with poor economic performance, two branches of literature can be related to this event to consider a potential effect on electoral participation.

On one hand, there is the effect of acts of corruption, as they contribute to diminishing levels of interpersonal trust and trust in the government (Mishler & Rose, 2001; Solé-Ollé & Sorribas-Narravo, 2014). These acts of corruption can undermine public confidence in the ability of authorities to effectively address public concerns, such as ensuring the safety of essential resources like water.

Starting with corruption, Sundström and Stockemer (2015) find that, when examining electoral participation across a large set of municipalities in Europe, citizens' perception of

government corruption is related to lower voter turnout. Costas-Pérez (2014) focuses on the surge of corruption cases in Spain at the beginning of the century and also finds, using matching techniques, that the withdrawal hypothesis prevails over the mobilization hypothesis. Using individual survey data and election results for 26 countries, Dahlberg and Solevid (2016) find that corruption is associated with lower electoral participation, but only when corruption levels change in countries with moderate to low levels of corruption. Chong et al. (2015) conducted a field experiment to test the withdrawal hypothesis in Mexico. They find that providing voters with more information about the incumbent's corrupt acts not only reduces support for the governing party but also diminishes support for the opposition, weakens party affiliations, and lowers voter turnout. Stockemer et al. (2012) argue that there may be reverse causality between corruption and electoral participation, and they instrument corruption using GDP and a measure of the quality of democracy over time. The authors also find that higher levels of corruption are associated with lower electoral participation. Lastly, adjacent to the topic of corruption, Grönlund and Setälä (2007) utilize survey data to demonstrate that trust in institutions and democracy is associated with higher electoral participation, while trust in specific politicians is not correlated with electoral participation.

On the economic performance side, Rosenstone (1982) utilizes individual-level survey data along with a time series of electoral participation in the United States. He finds that unemployment, poverty, and financial well-being correlate with lower electoral participation. Kama, Aksoy, and Taştan (2022) employ regional-level data on electoral participation in different regions of Turkey and find that in more densely populated, urbanized areas with higher levels of human capital, inflation (their measure of economic adversity) is associated with higher electoral participation, suggesting a mobilization hypothesis. However, they find that economic growth (positive economic performance) has no effect on participation. Lynge and Martínez i Coma (2022) study presidential elections in Africa and find the opposite pattern, with higher economic growth associated with greater electoral participation (in terms of correlation), while economic downturns lead to voter apathy. Burden and Wichowski (2014), aiming to contrast existing literature that concluded worse economic performance was associated with lower electoral participation in the United States, find that higher unemployment rates are associated with higher electoral participation, and this correlation is stronger when the incumbent is a Republican. Finally, Park (2021) shifts from measuring absolute economic performance to a relative measure, i.e., how voters perceive the economic situation of their country compared to other countries. The author finds that a relatively worse economy is associated with lower levels of electoral participation.

The Flint Water Crisis made it unavoidable for the residents of Flint to become aware of what their city government, in conjunction with the State government given its involvement through the emergency manager, was and was not doing. Therefore, a final relevant point is the role that information plays in voter propensity. Formal and model-based theories of voting argue that a higher level of information leads to a greater likelihood of voting. However, information acquisition is endogenous to each individual. Lassen (2005) takes advantage of a natural experiment in which, in 1996, the city of Copenhagen implemented a pilot program in which four out of fifteen districts (selected not randomly but for their representativeness of the city) began to be administered in a decentralized manner. Then, in 1999, a citywide referendum was held to decide whether to extend this decentralized system to all districts. In the four districts that were part of the pilot program and were better informed about the implications of the new system, voter turnout was higher than in the other eleven districts.

In summary, given that the majority of the literature lacks convincingly exploited exogenous variation or panel-type variation, this proposal becomes particularly relevant. Understanding why, when, and in what types of elections (mayoral, local legislative, national legislative, or presidential) and for which positions society feels more or less inclined to vote after a political, economic, social, and humanitarian crisis like the Flint Water Crisis is a question of utmost importance. Elections are events where the checks and balances of the democratic system are at stake, and they are essential mechanisms for accountability, transparency, and representation (Cantú & Saiegh, 2011).

The Flint Water Crisis thus becomes a unique scenario for contrasting the hypotheses of mobilization and withdrawal, although within the specific context of Flint at that particular moment, without claiming external validity. The United States also has the particularity that voting is not compulsory, meaning that the decision to participate in the electoral process is voluntary and freely made by individuals. This provides an ideal opportunity to study the electoral behavior of the citizenry.

4 Data

The Michigan State Department collects data for every election since 1998, both for midterms and presidential elections. I leverage a unique dataset of every election from 1998 through 2020 which contains votes cast by precinct for every government office and every candidate on the ballot each election.

Given the lack of local elections at the county and city level, I study voter turnout by looking at the two most important offices in every election cycle: governor and president.

A rational voter would understand that, despite the personal involvement of President Obama who sought to only mitigate the crisis, accountability lies in state officials, who had appointed the successive emergency managers and who were then directly responsible for the handling of city affairs, and consequently, the Crisis.

While the Michigan State Department covers all counties, I will only focus on Genesee County. Within it, all precincts in Flint City are considered affected by the Crisis and precincts corresponding to other townships and cities are then the control units.

This final dataset consists of 15,476 observations for every candidate-precinct votes combination for governor elections and 1,394 observations for total votes by precinct; 12,455 for every candidate-precinct votes combination for presidential elections and 1,368 observations for total votes by precinct. There are then, in total, 2,762 observations for total votes at the precinct level.

Table 1 provides descriptive statistics for all relevant variables available.

Table 1: Summary Statistics

	Treated			Control		
	N	Mean	S. D.	N	Mean	S. D.
Units	61			213		
Votes		533.1	296.4		854	383.4
Republican party share		16.2%	14.2%		43.6%	13.6%
Population		109852.7	14629.6		17856.8	10568

We can observe that Flint City overwhelmingly votes, on average, for the Democratic Party -in every election the two traditional parties account for almost the total majority of votes cast-, and we can already note that there are fewer votes by precinct in Flint City than in the control precincts. Also, Flint City’s average population throughout the period under study is several magnitudes greater than the average population in other cities.

5 Econometric Model and Results

To study then my main hypothesis, that is, the potential incidence of the Crisis on voter turnout, and the parallel trends assumption, the following event study econometric model is proposed

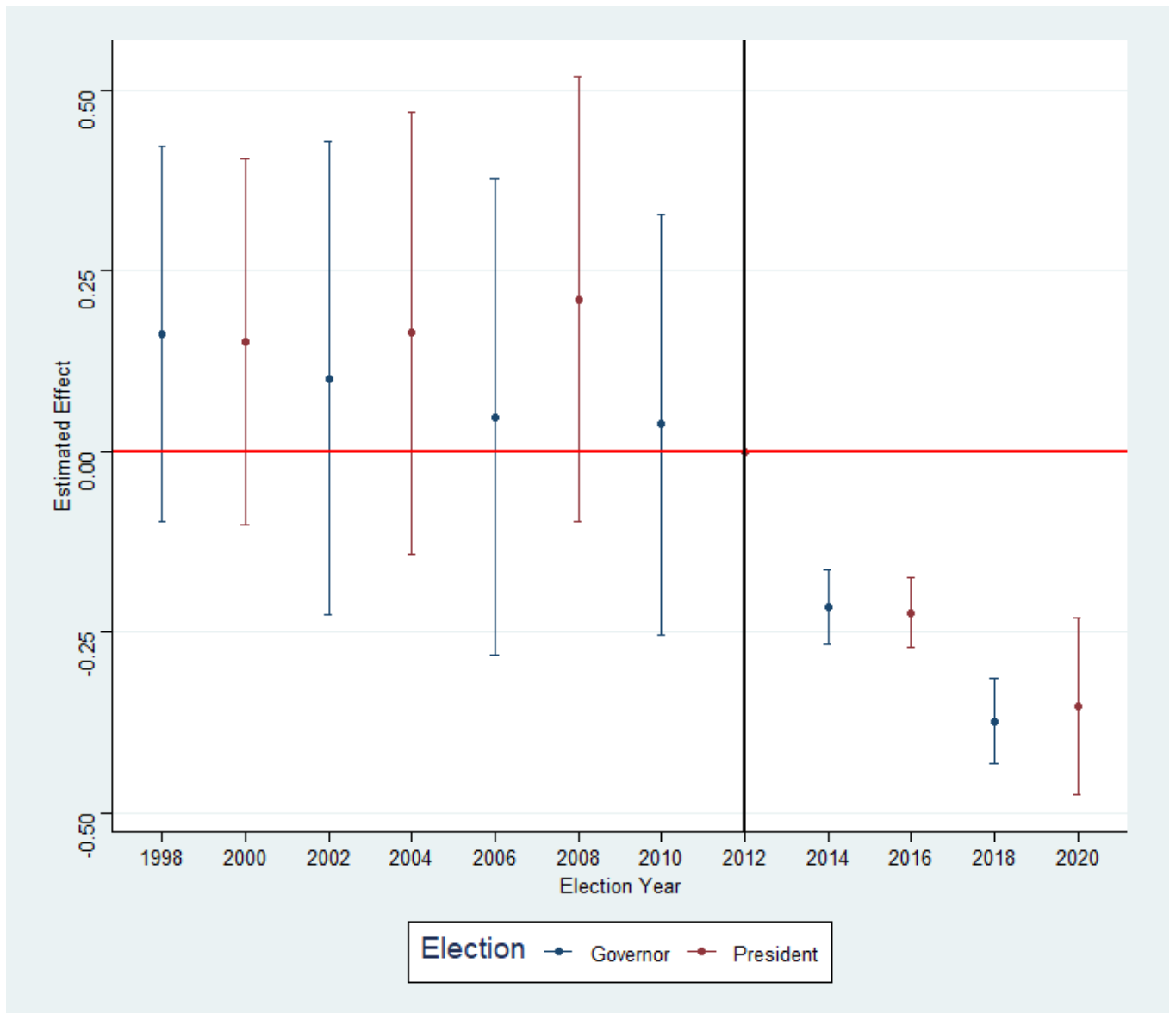
$$\begin{aligned} \log(\textit{Precinct Votes}_{ict}) = & \sum_{k=-q}^Q \beta_k \textit{Water Crisis}_{ick} + \lambda \log(\textit{Population}_{ct}) \\ & + \sigma \textit{Republican Party Share}_{ict} + \alpha_i + \delta_c + \gamma_t + \epsilon_{ict} \end{aligned} \quad (1)$$

Where the variable of interest is *Water Crisis*, *Population* is a time varying population control at the city level, *RepublicanPartyShare* is a time varying control at the precinct level, α_i is a precinct fixed effect, δ_c is a city fixed effect, γ_t is an election fixed effect, and ϵ_{ict} is the usual error term. The number of periods Q is equal to 12, since the available data cover six midterms and six presidential elections.

5.1 Event Study Results

Figure 1 presents then the results of estimating Equation 1. We can observe that the parallel trends assumption holds, and that there is a statistically significant effect of the Water Crisis on voter turnout, and that this effect has deepened over time.

Figure 1: Effect on Voter Turnout



The point estimates indicate a 19.4% decrease in voter turnout during the height of the Crisis, a 20% decrease in the 2016 elections, a 31.1% decrease in the 2018 midterms and a 29.7% decrease in the 2020 presidential elections.

5.2 Effect on Votes for Republicans

A crisis of such magnitude begs the question: Do voters punish incumbents?

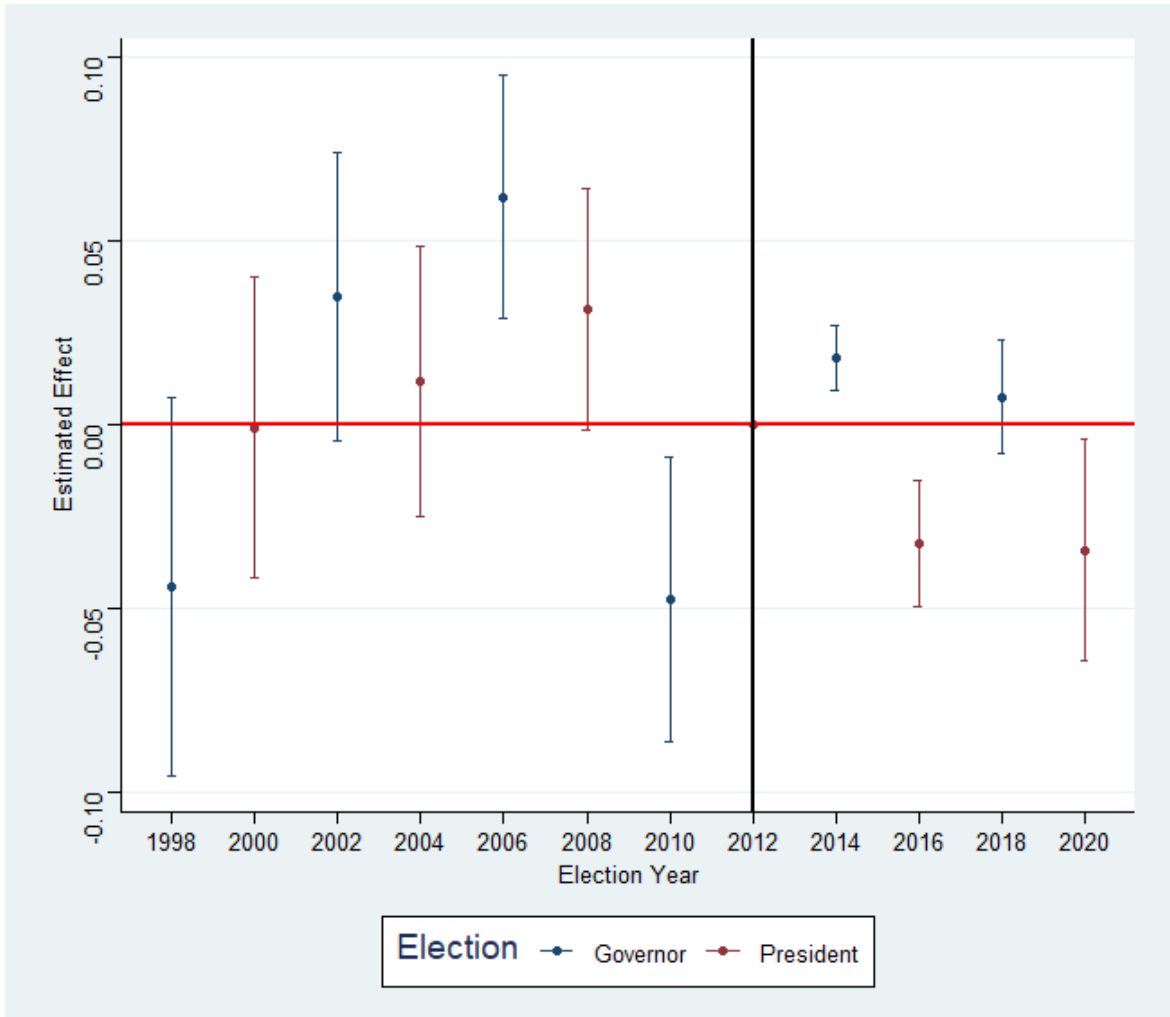
To answer this question the following econometric model is presented:

$$\begin{aligned} \text{Republican Party Share}_{ict} = & \sum_{k=-q}^Q \beta_k \text{Water Crisis}_{ick} + \lambda \log(\text{Population}_{ct}) \\ & + \alpha_i + \delta_c + \gamma_t + \epsilon_{ict} \end{aligned} \quad (2)$$

Where now, the Republican Party's share of the vote is the dependent variable.

Figure 2 presents the results of estimating Equation 2. Unfortunately, the parallel trends assumption does not hold. This points towards a certain volatility in voter preferences, and at the very least, it is curious to see that during the first year of the Crisis -for which we must keep in mind that the Governor was partially responsible- voters did not punish the Republican Party, but actually voted relatively more for the Republican incumbent.

Figure 2: Effect on Republican Party's Vote Share



6 Concluding Remarks

Flint City throughout the last half century has been a city in decline. A dwindling and impoverished population, twice in the last twenty years subjected to State intervention, was consciously poisoned by a caretaker State appointed government, with the knowing avowal of its city council. Lead contaminated and bacteria infested water circulated for over a year and a half unchecked, an event which could have tremendous consequences in the long run for the population due to the impact of these pollutants on important health issues, including the crucial development of young children. Even when it was acknowledged, the city entered a period of renewal of its infrastructure, but it is as of yet not fully complete.

Thus, the full consequences of the Crisis are not yet readily apparent, a decade has not yet passed. However, in this study I have found evidence of at least one consequence of the Crisis: distrust of institutions reflected in a lowered voter turnout. Further avenues of research could include educational attainment -given the severe impact of lead on child development-, long-term health effects, consequences on development and long-term mistrust of formal institutions and cultural impacts.

There is a large literature, kick-started in economics by Douglass North and furthered by the New Institutionalists in the past two decades, on the importance of institutions for development. This distrust exhibited by a lower commitment to democracy could then prove a serious hindrance to turn around the city's poor socioeconomic standing and leave Flint in a perpetual state of underdevelopment and one of the poorest cities in the U.S.

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