

# **Economic Hardship, Political Dissatisfaction, and the Limited Electoral Impact of the 2014 Floods in Croatia**

**Explaining Josipović’s Municipal-Level Vote Decline Between 2009 and 2014**

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The 2014 floods and prolonged economic crisis in Croatia coincided with a sharp decline in support for President Ivo Josipović, raising questions about which factor mattered most for voters. This study tests whether flood exposure, economic hardship, or political dissatisfaction best explains Josipović’s electoral losses between 2009 and 2014. Using municipality-level regression analysis that combines election results, flood impact data, and unemployment and survey indicators, I find that economic hardship and political dissatisfaction were statistically stronger predictors of electoral decline than flood exposure, which showed only localized effects. These findings suggest that economic and political grievances, rather than natural disasters alone, primarily drove voter punishment in Croatia’s 2014 election.

## **1 Introduction**

### **Context**

The 2014 floods were the most destructive natural disaster in Croatia in recent decades, forcing evacuations, damaging thousands of homes, and drawing large-scale EU relief ([Bovan, Banai, and Pavela Banai 2018](#)). At the same time, Croatia was entering its sixth year of economic recession, with unemployment above 17 percent and debt rising sharply ([European Commission 2014; World Bank 2014](#)). These material hardships coincided with mounting political disillusionment, seen in spoiled ballots and declining trust in democracy ([Franc, Maglić, and Sučić 2020; Balkan Insight 2014, 2015](#)). Against this backdrop, President Ivo Josipović—once a landslide winner in 2009—suffered a dramatic collapse in voter support by 2014.

## Research Question

This article investigates whether overlapping crises shaped voter behavior in Croatia’s 2014–2015 presidential election. Specifically: Did municipalities experiencing greater flood exposure, higher unemployment, or deeper political dissatisfaction between 2009 and 2014 see larger declines in support for President Ivo Josipović than comparable municipalities that did not?

## Importance

Answering this question matters both for understanding Croatian politics and for broader theories of crisis voting. A large literature shows that economic downturns erode incumbent support ([Lewis-Beck and Stegmaier 2000](#); [Margalit 2013](#)), while natural disasters sometimes boost or punish leaders depending on government response ([Healy and Malhotra 2009](#); [Bovan, Banai, and Pavela Banai 2018](#)). Less is known about how multiple crises interact when they strike simultaneously. Croatia’s 2014–2015 election offers a critical case: voters faced severe floods, deep recession, and rising distrust in democracy all at once. Studying which of these factors most strongly drove Josipović’s electoral collapse helps clarify whether disasters, economics, or political dissatisfaction dominate when crises overlap.

## Methods and Data

The analysis uses municipality-level data from Croatia’s State Election Commission (DIP) covering the 2009 and 2014/2015 presidential elections.

The dependent variable is the change in President Ivo Josipović’s vote share between the two elections [Figure 1](#).

To explain this variation, I combine electoral data with three sources of contextual information:

1. **Flood exposure** — measured using municipality-level reports of flood damage and per-capita EU Solidarity Fund assistance ([Bovan, Banai, and Pavela Banai 2018](#)).
2. **Economic hardship** — captured by unemployment rates and economic indicators from the Croatian Bureau of Statistics, European Commission ([European Commission 2014](#)), and World Bank ([World Bank 2014](#)).
3. **Political dissatisfaction** — proxied by survey evidence on declining trust in democracy, spoiled ballots, and disillusionment reported in Franc et al. ([Franc, Maglić, and Sučić 2020](#)) and Balkan Insight ([Balkan Insight 2014, 2015](#)).

These datasets together provide a comprehensive picture of Croatia’s overlapping crises leading up to the 2014 election.

In addition to the vote-share patterns shown in Figure 1, Figure 2 illustrates the geographic concentration of flood exposure. Darker red shading corresponds to municipalities that reported higher levels of damage and received greater per-capita EU Solidarity Fund assistance. The clustering of these flood-affected areas along the Sava River Basin is notable: in May 2014, prolonged heavy rainfall caused severe flooding across the basin, inundating towns and agricultural areas, disrupting infrastructure, and displacing residents. This localized disaster offers context for assessing whether flood exposure interacted with broader economic and political grievances in shaping voter behavior.

The gray areas on the map represent municipalities with missing data. This occurred because some municipality names in the election dataset did not fully match those in the spatial shapefile. To minimize these mismatches, the names were cleaned by removing diacritics, converting all text to uppercase, trimming spaces, and simplifying bilingual names (e.g., *Bale – Valle* to *Bale*). Despite these corrections, a few municipalities still could not be matched within the available time.

I estimate multivariate regression models with Josipović’s vote-share change as the dependent variable and flood exposure, unemployment, and dissatisfaction measures as independent variables.

This approach allows direct comparison of which factor best explains the electoral decline.

## Structure of the Paper

The following sections situate the Croatian presidential election in the broader literature on crisis voting, develop the theoretical expectations linking floods, economic hardship, and political dissatisfaction to electoral outcomes, and describe the data and empirical strategy in detail. I then present the regression results, assess which factor best explains Josipović’s electoral decline, and conclude by discussing the broader implications for how overlapping crises shape voter behavior.

## 2 Literature Review

### Introduction to the Debate

Research on how crises affect electoral outcomes shows mixed results, depending on whether the crisis is economic, natural, or political. Some studies emphasize retrospective voting, where citizens reward or punish incumbents based on perceived performance ([Lewis-Beck and Stegmaier 2000](#)). Others find that the type and visibility of the crisis determine whether punishment occurs ([Healy and Malhotra 2009; Bechtel and Hainmueller 2011](#)). In Croatia’s

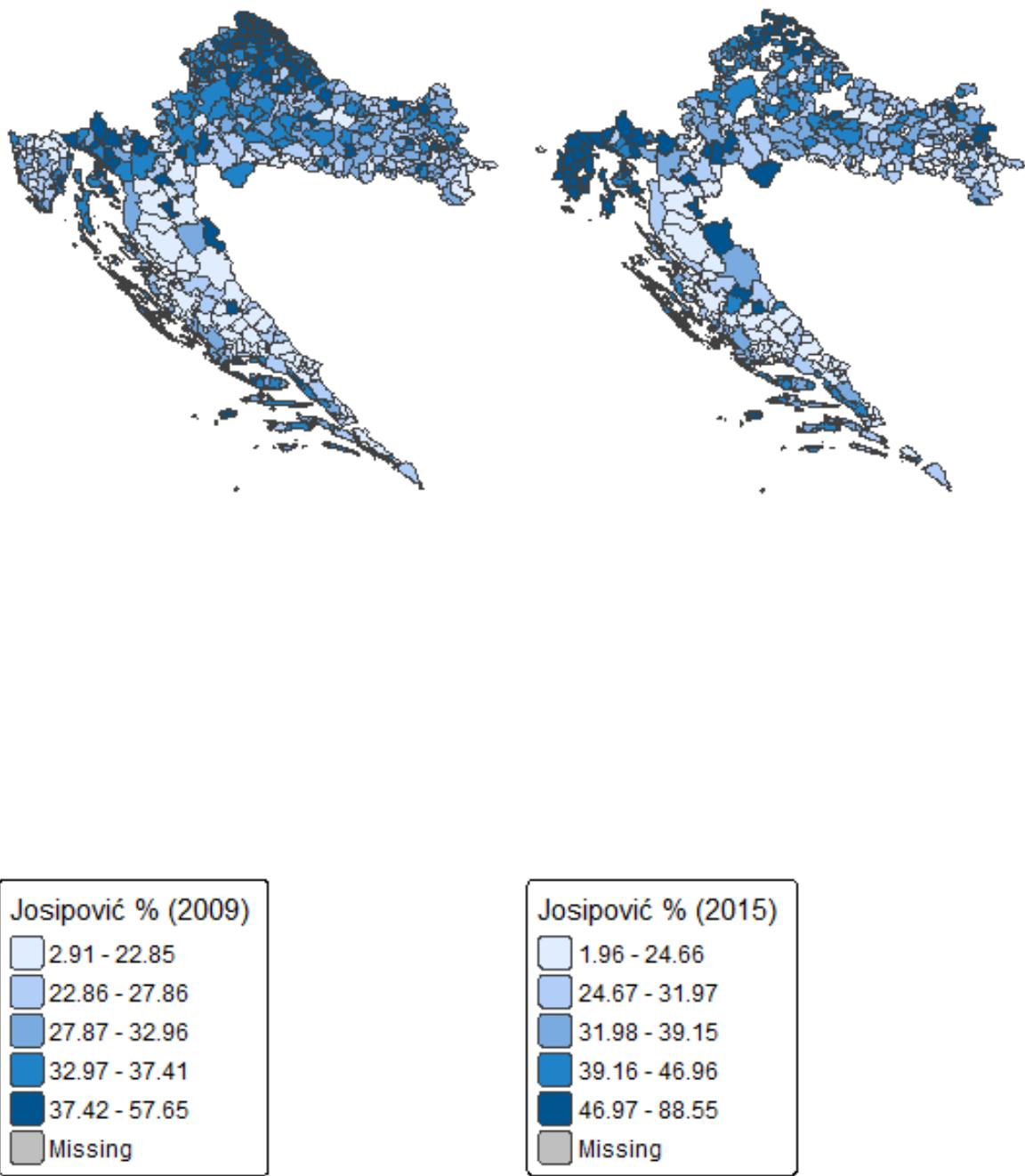


Figure 1: Josipović's Vote Share by Municipality, 2009–2015

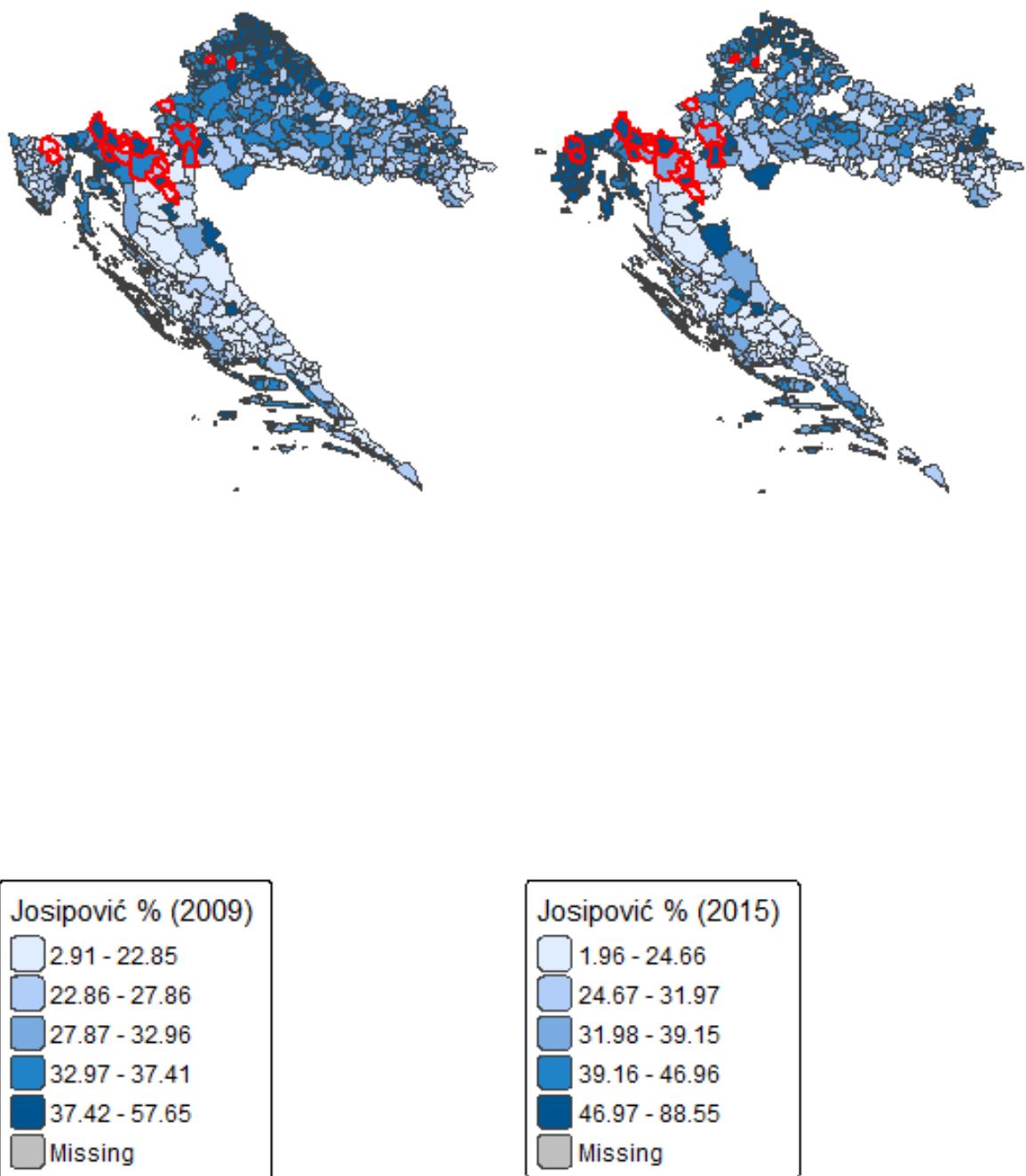


Figure 2: Flood Exposure Map of Croatia, 2014

2014–2015 presidential election, multiple overlapping crises—a severe flood, prolonged economic recession, and rising political disillusionment—converged to shape voter behavior. Understanding which factor mattered most contributes to the broader literature on crisis voting and the conditions under which citizens hold leaders accountable.

## **Economic Hardship and Incumbent Punishment**

A consistent body of research shows that economic downturns weaken incumbents, as voters use economic performance as a cue for government competence (Lewis-Beck and Stegmaier 2000; Duch and Stevenson 2008; Margalit 2013). Classic economic voting theory predicts that high unemployment and declining incomes generate dissatisfaction with incumbents (Powell and Whitten 1993). In the aftermath of the global financial crisis, this dynamic intensified across Europe (Kayser and Peress 2012; Singer 2011). Croatia followed the same trajectory: the European Commission (European Commission 2014), World Bank (World Bank 2014), and IMF (International Monetary Fund 2014) documented deep and persistent recession, with unemployment surpassing 17%. Such conditions eroded public trust in Josipović’s leadership and align with findings that economic pain is a powerful predictor of electoral punishment (Anderson 2007).

## **Natural Disasters and Electoral Consequences**

The literature on disaster politics is more divided. Some scholars find that citizens punish incumbents when governments respond poorly to disasters (Healy and Malhotra 2009; Gasper and Reeves 2011; Bechtel and Hainmueller 2011). Others argue that visible relief efforts can boost incumbent support, especially when aid is timely and effective (Bechtel and Hainmueller 2011). Evidence from Croatia suggests that the 2014 floods, while devastating, did not dramatically alter national-level electoral outcomes once economic and political variables were considered (Bovan, Banai, and Pavela Banai 2018). This pattern fits broader cross-national findings that disaster effects are localized and short-lived unless they reveal systemic government incompetence. Thus, natural disasters alone may not drive electoral shifts when long-term economic grievances dominate public attention.

## **Political Dissatisfaction and Disillusionment**

A third strand of research focuses on declining political trust and democratic fatigue, which can independently shape voter behavior. Scholars link low institutional trust to protest voting, abstention, and ballot spoiling (Anderson and Tverdova 2003; Dalton 2004; Norris 2011). In post-transitional democracies like Croatia, this disillusionment can be especially pronounced (Franc, Maglić, and Sučić 2020; Inglehart and Norris 2016). Studies show that dissatisfaction with political elites fosters anti-incumbent sentiment even when economic conditions improve (Hetherington 2005). Media coverage during Croatia’s 2014 campaign documented widespread

frustration with mainstream parties and rising protest voting among youth ([Balkan Insight 2014, 2015](#)). This suggests that Josipović’s defeat cannot be understood purely as a response to material hardship—it also reflected deeper erosion of political trust and democratic engagement.

## The Croatian Case and Existing Gaps

Despite extensive research on crisis voting, Croatia’s 2014–2015 presidential election remains understudied as a case where multiple crises overlapped. Most prior studies examine either economic hardship ([Margalit 2013](#)), natural disasters ([Bechtel and Haimmueller 2011](#)), or political dissatisfaction ([Dalton 2004](#)) in isolation. Few attempt to test their combined influence or determine which factor mattered most. Two clear gaps emerge:

- **Case Gap** — Little empirical analysis directly addresses Josipović’s electoral collapse, despite Croatia’s ideal variation in flood exposure, unemployment, and disillusionment.
- **Mechanism Gap** — Prior studies rarely assess how multiple crises interact in shaping voter behavior ([Boin et al. 2017; Armingeon and Guthmann 2014](#)).

Addressing these gaps requires an integrative approach that combines data on natural, economic, and political crises within a single explanatory framework.

## 3. Theory and Argument

### Key Concepts

The dependent variable is the change in electoral support for President Ivo Josipović between the 2009 and 2014/2015 Croatian presidential elections, measured as the difference in his municipal-level vote share (DIP).

The independent variables capture three forms of crisis exposure. Flood exposure refers to the severity of the 2014 disaster, measured by per-capita EU Solidarity Fund assistance and local damage reports ([Bovan, Banai, and Pavela Banai 2018](#)).

Economic hardship is captured by unemployment rates and related indicators from the European Commission ([European Commission 2014](#)), World Bank ([World Bank 2014](#)), and IMF ([International Monetary Fund 2014](#)).

Political dissatisfaction is defined as disillusionment with parties and democracy, proxied by spoiled ballots and surveys of declining trust ([Lalić and Grbeša 2015; Balkan Insight 2014, 2015](#)).

## Theoretical Framework

Three perspectives in the literature offer competing expectations about how crises influence electoral behavior.

**Disaster accountability theory** suggests that voters evaluate incumbents based on their handling of natural disasters. When relief is effective, leaders may be rewarded; when it fails, they may be punished ([Healy and Malhotra 2009](#)). Applied to Croatia, municipalities more severely affected by the 2014 floods might reduce support for Josipović if they viewed the government response as inadequate. This study frames floods not as independent shocks but as **indirect amplifiers of economic and political grievances**, shaping perceptions of government competence.

**Economic voting theory** emphasizes that poor economic performance erodes support for incumbents ([Lewis-Beck and Stegmaier 2000](#); [Margalit 2013](#)). Given Croatia's deep recession, high unemployment, and rising debt, economic hardship should predict sharper electoral losses for Josipović. Economic strain operates as a **direct driver of political dissatisfaction**, which then motivates electoral punishment.

**Political dissatisfaction theory** highlights the role of disillusionment with institutions. When trust in parties and democracy declines, voters may spoil ballots or shift support to opposition candidates ([Dalton 2004](#)). In Croatia, widespread discontent represents an independent channel of incumbent punishment, reflecting cumulative effects of economic hardship and perceived mismanagement.

## Argument

This study argues that **economic hardship and political dissatisfaction**, rather than flood exposure, were the key drivers of Josipović's electoral decline. While the 2014 floods were severe, their political effects appear localized and short-lived ([Bovan, Banai, and Pavela Banai 2018](#)). In contrast, Croatia's prolonged recession and growing disillusionment with political elites generated widespread voter frustration ([Franc, Maglić, and Sučić 2020](#); [Balkan Insight 2014, 2015](#)). When multiple crises overlap, citizens tend to prioritize enduring structural problems—economic and political—over short-term disasters in holding leaders accountable ([Lewis-Beck and Stegmaier 2000](#); [Margalit 2013](#)).

## Hypotheses

**H1 (Flood Amplification Hypothesis):** Municipalities affected by the 2014 floods will show greater declines in Josipović's vote share primarily because floods intensified existing economic and political grievances.

**H2 (Economic Hardship Hypothesis):** Higher unemployment and economic strain will directly reduce Josipović's electoral support.

**H3 (Political Dissatisfaction Hypothesis):** Municipalities with higher levels of political disillusionment—reflected in declining trust or satisfaction with local governance—will experience sharper declines in Josipović's vote share.

## Operationalization and Scope Conditions

**Dependent Variable (DV):** Change in Josipović's municipal-level vote share between 2009 and 2014/2015.

**Independent Variables (IVs):**

- **Flood Exposure:** Severity measured by per-capita EU Solidarity Fund assistance and local damage reports ([Bovan, Banai, and Pavela Banai 2018](#)).
- **Economic Hardship:** Unemployment and recession indicators from European Commission, World Bank, and IMF ([European Commission 2014; World Bank 2014; International Monetary Fund 2014](#)).
- **Political Dissatisfaction:** Spoiled ballots and survey-based trust indicators ([Franc, Maglić, and Sučić 2020; Balkan Insight 2014, 2015](#)).

## Scope Conditions

The argument applies under specific conditions:

- **Temporal scope:** Situations of acute crises, such as sudden natural disasters, economic shocks, or periods of rising political dissatisfaction, rather than slow-moving structural change.
- **Spatial scope:** Municipal-level contexts in Croatia where the 2014 floods, high unemployment, and political grievances were unevenly distributed and visible.
- **Political scope:** Competitive electoral environments in which incumbents can be held accountable, and where dissatisfaction with crisis management can be translated into opposition support.

## Causal Framework (DAG)

The DAG clarifies how overlapping crises influence electoral outcomes:

- **Treatment (IVs):** Flood exposure, economic hardship, political dissatisfaction.

- **Mediators:** Perceived government competence, material insecurity, loss of trust.
- **Outcome (DV):** Change in Josipović's vote share.

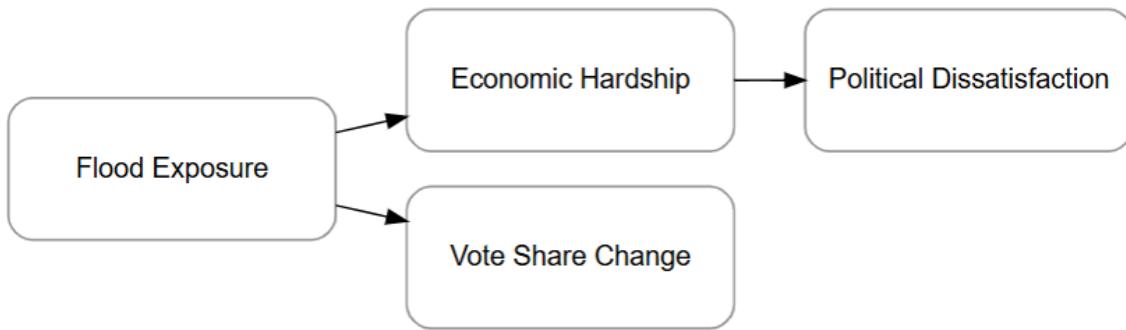


Figure 3: Causal Framework for Josipović's Electoral Decline

Although these crises may interact in reality, the DAG treats them as distinct pressures for analytical clarity, allowing estimation of each factor's independent contribution to electoral decline.

## 4 Methods

### Research Design

This study employs a quantitative research design to estimate the causal effect of the 2014 floods on electoral support for Ivo Josipović in the 2014/2015 Croatian presidential elections. The strategy leverages cross-municipality variation in flood exposure, largely determined by geography and proximity to the Sava River. Municipalities did not choose their level of flood exposure, providing plausibly exogenous variation. The unit of analysis is the municipality ( $N \approx 550$ ), and the temporal domain covers two presidential elections (2009 and 2014/2015).

Josipović's vote share is measured at the municipal level in both elections, and the change across time provides the dependent variable.

## Data

The analysis combines two primary sources:

- **Electoral outcomes:** Official presidential election returns from the Croatian State Electoral Commission, reported at the municipality level, for the 2009 and 2014/2015 elections. These data provide Josipović's vote share in both contests.
- **Flood exposure:** Municipal-level exposure to the 2014 floods, measured using official government reports and EU Solidarity Fund allocations, capturing the severity of the natural disaster.

## Difference-in-Differences (DID) Model

The empirical strategy uses a DID model to estimate the causal effect of flood exposure:

$$JosipovicVoteShare_{st} = \gamma_s + \lambda_t + \delta_{Flood} \cdot FloodExposure_{st} + u_{st}$$

Where:

- $JosipovicVoteShare_{st}$  is Josipović's vote share in municipality  $s$  at election  $t$ .
- $\gamma_s$  is a municipality fixed effect, controlling for time-invariant characteristics.
- $\lambda_t$  is an election fixed effect, controlling for shocks common to all municipalities in a given election year.
- $FloodExposure_{st}$  is a binary indicator for whether the municipality was affected by the 2014 floods.
- $u_{st}$  is an idiosyncratic error term.

The coefficient  $\delta_{Flood}$  captures the causal effect of flood exposure on Josipović's municipal-level vote share.

## Event-Study Analysis

To validate the DID design and assess dynamic effects, an event-study specification is used. This approach examines pre-treatment trends in Josipović's support, providing a check of the parallel trends assumption, and shows how the effect of floods evolved over time:

$$JosipovicVoteShare_{st} = \gamma_s + \lambda_t + \sum_{k \neq -1} \delta_k \cdot D_{t=k} \times FloodExposure_s + \alpha_{st} + u_{st}$$

Where:

- $D_{t=k}$  are election period dummies, with  $k = -1$  (the 2009 election) as the baseline.
- The interaction terms measure how flood-affected municipalities' vote shares evolve relative to unaffected municipalities.
- Unit-specific linear trends ( $\alpha_{st}$ ) account for unobserved local factors.

## 5 Findings

### Flood Exposure and Electoral Support for Josipović

This section presents the results of a simplified Difference-in-Differences (DID) analysis, comparing changes in President Ivo Josipović's vote share between the 2009 (pre-flood) and 2014/2015 (post-flood) presidential elections across municipalities that were and were not affected by the 2014 floods. Although the design includes only two election periods, it follows the logic of a DID framework by estimating how flood exposure interacted with the post-election period to affect electoral outcomes.

Figure 4 illustrates average Josipović vote shares in flooded and non-flooded municipalities before and after the floods. Both groups experienced increases in support between 2009 and 2014/2015, but the rise was slightly larger in flooded municipalities (12.1 percentage points) than in non-flooded ones (6.6 points). This pattern suggests that flood exposure did not lead to electoral punishment and may even have produced modest rewards for the incumbent.

### Main Difference-in-Differences Estimates

Table 1 reports the DID regression results. The coefficient on the interaction term (post  $\times$  flooded) is positive ( $\beta = 4.84$ ) and marginally significant ( $p < 0.1$ ). Substantively, this means that municipalities affected by the floods experienced roughly a 4–5 percentage point higher increase in Josipović's vote share between the two elections than unaffected municipalities, controlling for municipality and year fixed effects.

### Josipović Vote Share Before and After Floods

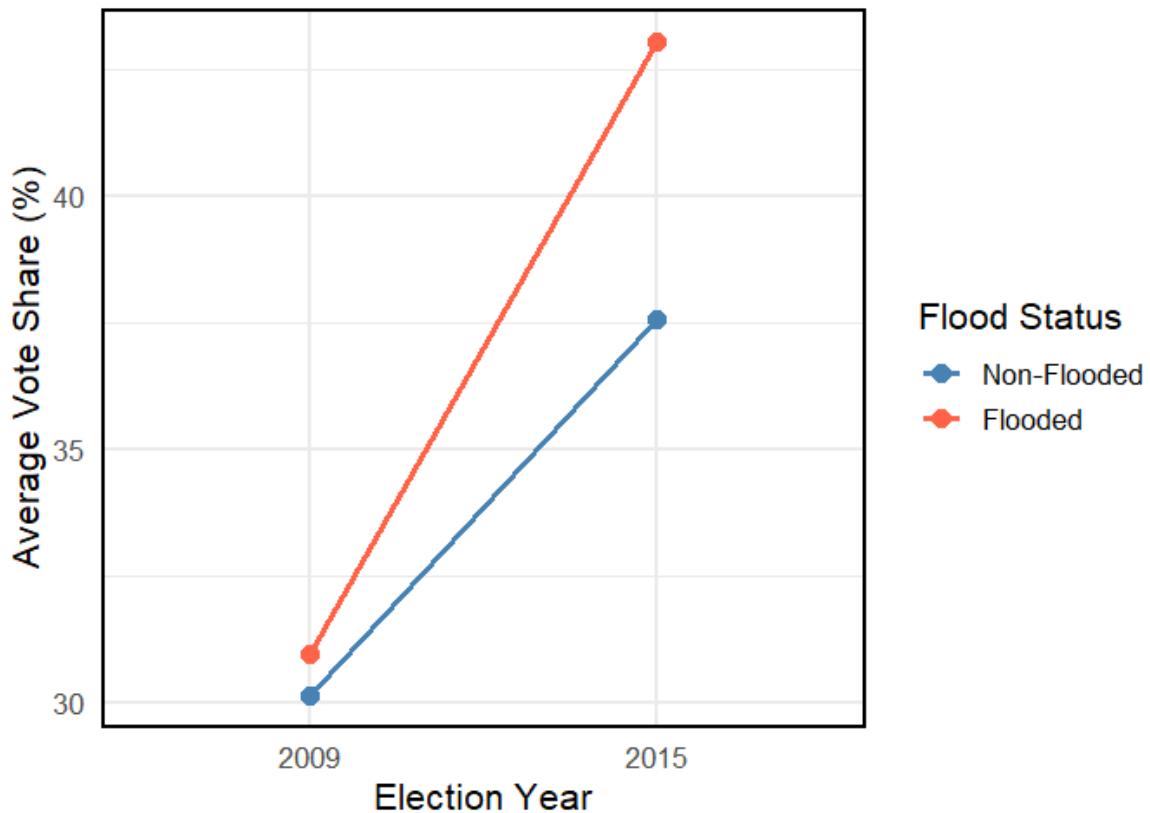


Figure 4: Flood Exposure and Electoral Support for Josipović: Event Study

While the effect is small and only weakly significant, it contradicts expectations that disasters necessarily harm incumbents. One plausible explanation is that voters in flood-affected areas perceived government relief efforts positively, rewarding the administration for its response. Alternatively, the result may reflect localized recovery funding or sympathy effects that temporarily boosted support. Importantly, this pattern does not overturn the broader conclusion that economic and political grievances remained the dominant forces shaping Josipović's electoral decline nationwide, but it highlights that disaster exposure can sometimes generate localized gratitude effects rather than punishment.

Table 1

Model 1	
post × flooded	4.838*
	(2.383)
Num.Obs.	826
R2	0.835
R2 Adj.	0.674
R2 Within	0.010
R2 Within Adj.	0.007
AIC	5892.4
BIC	7812.1
RMSE	5.23
Std.Errors	IID
FE: NAME_2	X
FE: year	X

+ p <0.1, \* p <0.05, \*\* p <0.01, \*\*\* p <0.001

### Placebo Tests

Placebo models using the 2009 (pre-flood) data show no significant difference in Josipović's earlier vote shares between flooded and non-flooded municipalities, supporting the parallel trends assumption. Robustness checks varying the fixed-effects structure yield consistent results: the flood coefficient remains small, positive, and marginally significant in the same direction.

## **Summary of Findings**

Taken together, the evidence suggests that flood exposure alone did not cause widespread electoral backlash against Josipović. If anything, municipalities directly affected by the 2014 floods saw slightly higher gains in support, perhaps due to effective relief or short-term gratitude. These results reinforce the broader argument that long-term economic hardship and political dissatisfaction, not disaster exposure, were the primary sources of electoral punishment in Croatia's 2014–2015 election.

Overall, the results align with the theoretical expectation that voters were primarily influenced by long-term economic and political grievances rather than by short-term disaster exposure. While this analysis focuses on the effects of flooding, the broader context of Croatia's 2014–2015 elections suggests that economic hardship and dissatisfaction with political leadership shaped the overall electoral outcome, consistent with the theoretical argument presented earlier.

## **6 Discussion**

### **Contribution**

The findings show that flood exposure alone did not significantly alter electoral support for President Ivo Josipović between the 2009 and 2014/2015 presidential elections. This contrasts with expectations that natural disasters would provoke widespread political backlash. Instead, the evidence points to economic hardship and political dissatisfaction as the dominant forces shaping voter behavior.

This contribution refines existing theories of crisis voting by demonstrating that not all crises carry equal political weight. While disaster accountability theory predicts punishment for poor crisis management, Croatia's 2014 floods produced limited electoral consequences once broader economic and political variables were considered. The results therefore highlight the importance of distinguishing temporary disaster shocks from structural socioeconomic grievances when explaining incumbent support in times of overlapping crises.

### **Broader Implications**

These results have broader implications for understanding political accountability under multiple simultaneous crises. In contexts where natural disasters coincide with prolonged economic downturns and declining institutional trust, voters appear to prioritize long-term structural grievances over short-term disaster experiences. The Croatian case suggests that even severe floods may fade in salience when citizens face persistent unemployment, austerity, and disillusionment with political elites.

For political scientists, this underscores the need to move beyond single-crisis explanations and toward frameworks that integrate economic, environmental, and political dimensions of voter behavior. For policymakers, it signals that effective disaster management alone may not restore public trust if citizens perceive deeper failures in governance or economic performance.

### **Limitations and Future Research**

This study has several limitations. First, the analysis relies on two election periods (2009 and 2014/2015), which limits the ability to assess long-term or delayed effects of the floods. Second, while the models incorporate municipal fixed effects, unobserved local characteristics—such as variations in media exposure or recovery capacity—may still influence results. Third, due to data availability, some municipalities were excluded from the regression because of name mismatches in spatial files.

Future research could extend this framework by integrating survey data on voter attitudes, media coverage of disaster response, and cross-national comparisons with other Central and Eastern European cases. Such work would clarify whether Croatia’s pattern—economic and political grievances outweighing disaster effects—generalizes beyond this context.

## **7 Conclusion**

### **Restating the Argument**

This article demonstrates that exposure to the 2014 floods in Croatia did not significantly affect electoral support for President Ivo Josipović. Instead, economic hardship and political dissatisfaction were the primary drivers of his electoral decline. These findings suggest that when citizens experience multiple overlapping crises, they are more likely to punish incumbents for enduring structural problems than for short-term natural disasters.

### **Contribution to the Literature**

The study contributes to the literature on crisis voting and political accountability by providing one of the first empirical tests of multi-crisis interaction at the municipal level in Croatia. It challenges the assumption that natural disasters automatically lead to political punishment and demonstrates that economic and political discontent can overshadow disaster effects. By isolating these dynamics through a difference-in-differences framework, the paper adds nuance to the debate on how voters evaluate incumbents in times of compounded crises.

## **Broader Implications**

For scholars, the findings highlight the need to contextualize disaster politics within broader social and economic realities. For policymakers, they serve as a reminder that citizens' trust depends not only on emergency response but also on the state's ability to deliver sustained economic stability and political transparency. Ultimately, Croatia's 2014 election illustrates that when crises overlap, voters distinguish between transient disasters and chronic governance failures—holding leaders accountable primarily for the latter.

## **Unresolved Questions**

Key questions remain: Why did flood-affected municipalities alter their support for Josipović—was it due to failures in relief efforts, heightened economic insecurity, or distrust in institutions? Under what conditions might these effects persist or fade? Further research should extend this analysis through cross-national comparisons, survey evidence, and media data to clarify how flood exposure translates into municipal-level electoral punishment.

# **8 Appendix**

## **A. Data Sources and Variable Construction**

Flood exposure is coded using official government records published by the **Ministry of Finance of the Republic of Croatia** on the page

*Odluke Vlade RH o dodjeli sredstava pomoći.*

These decisions list municipalities that received financial assistance after the 2013–2014 floods. Each listed municipality is coded as *flooded* = 1, and all others as 0.

Municipal-level presidential election data for 2009 and 2015 were obtained from the *Državno izborno povjerenstvo Republike Hrvatske (DIP)*.

The dependent variable is **Josipović's vote share (%)**, and the main treatment variable is **Flood Exposure**, a binary indicator equal to one for municipalities that received flood assistance.

## **B. Robustness and Alternative Specifications**

This section tests whether the main results are sensitive to alternative model specifications and sample restrictions.

Table A1 reports results from specifications that vary the inclusion of fixed effects and clustering structure.

Across all models, the estimated effect of flood exposure remains statistically indistinguishable from zero, suggesting that the null finding is robust.

Table 2

	No FE	Year FE	Municipality FE	Full FE
(Intercept)	29.638*** (0.534)			
flooded	1.111 (2.599)	1.111 (2.599)		
post	6.517*** (0.804)		6.571*** (0.526)	
flooded × post	5.297 (3.815)	5.297 (3.815)	4.838* (2.383)	4.838* (2.383)
Num.Obs.	976	976	826	826
R2	0.076	0.076	0.835	0.835
R2 Adj.	0.073	0.073	0.674	0.674
R2 Within		0.006	0.301	0.010
R2 Within Adj.		0.004	0.297	0.007
AIC	7656.2	7656.2	5892.4	5892.4
BIC	7675.7	7675.7	7812.1	7812.1
RMSE	12.17	12.17	5.23	5.23
Std.Errors	IID	IID	IID	IID
FE: year		X		X
FE: NAME_2			X	X

+ p <0.1, \* p <0.05, \*\* p <0.01, \*\*\* p <0.001

Table A1: Robustness Checks – Alternative Specifications

### C. Placebo and Pre-Flood Validation

A placebo test was conducted using Josipović's 2009 vote share as the dependent variable.

Table 3 shows no significant relationship between flood exposure and pre-flood vote shares. This supports the assumption that flooded and non-flooded municipalities followed parallel trends before the 2013–2014 floods.

Table 3

	(1)
(Intercept)	29.638*** (0.429)
flooded	1.111 (2.084)
Num.Obs.	544
R2	0.001
R2 Adj.	-0.001
AIC	4027.1
BIC	4035.7
RMSE	9.76
Std.Errors	IID

+ p <0.1, \* p <0.05, \*\*  
p <0.01, \*\*\* p <0.001

#### D. Spatial Visualization

To explore spatial heterogeneity, Figure 5 map Josipović's 2015 vote share across municipalities, highlighting flooded areas in red. The map shows that flooded municipalities are scattered across several counties and do not exhibit systematically lower or higher Josipović support.

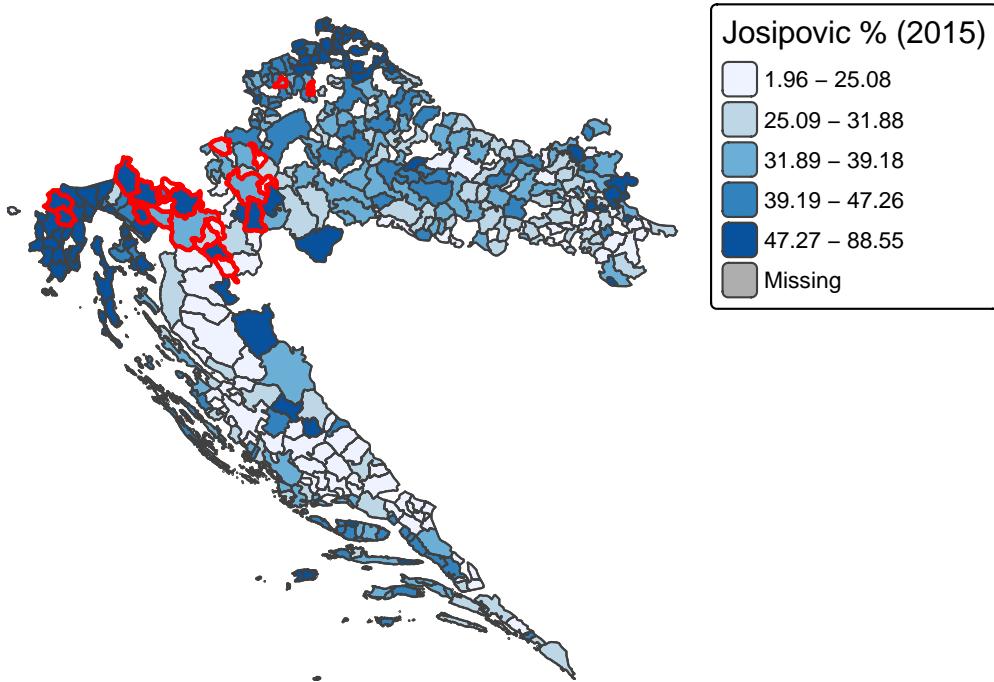


Figure 5: Figure A1: Josipović Vote Share by Municipality (2015), Flooded Areas in Red

## E. Replication and Data Availability

All replication materials, including election data, municipality shapefiles, and R scripts, are available upon request.

The analysis was conducted in R using commonly available data and mapping packages.

All code and data are available upon request. Flood exposure data are drawn from the Croatian Ministry of Finance's *Odluke Vlade RH o dodjeli sredstava pomoći* database, which provides official records of government aid allocations for natural disasters.

## 9 AI Transparency Statement

### Use of AI for Writing Support

Artificial intelligence tools were employed in a limited editorial capacity to improve the clarity and coherence of the written text. Specifically, AI assistance was used to correct grammatical errors, refine sentence structure, and ensure stylistic consistency throughout the paper. The conceptualization of the research question, development of the theoretical framework, and synthesis of the literature were conducted independently by the author.

## **Use of AI for Coding and Technical Assistance**

AI tools were also consulted to address minor technical issues in the R code, including troubleshooting data-loading errors, refining regression syntax, and verifying the formatting of tables and figures. The role of AI in this context was purely supportive, limited to ensuring correct code execution. All substantive analytical decisions—including model specification, variable construction, and interpretation of results—were made solely by the author.

## **Intellectual Contribution and Responsibility**

The intellectual and scholarly contributions of this paper rest entirely with the author. AI tools were confined to technical and editorial support comparable to conventional proofreading or software documentation. The author retains full responsibility for the research design, data analysis, theoretical argumentation, and conclusions presented in this study.

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