

Echoes of Terrorism: Examining the Effects of Siren Alerts Timing on Voter Preferences in Israel*

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November 20, 2024

Abstract

We document how electoral behavior changes based on the salience of national security threats. Using novel data on the timing and location of “Red Alerts” — siren warnings of rocket threats — we employ a difference-in-differences approach to analyze voting patterns in Israeli areas newly exposed to Hamas rocket fire in 2014. Our analysis shows that Red Alerts on the days immediately before the election boosted Likud’s vote share by 2.9 percentage points, while earlier alerts had no effect. Polarization increases as the effects are larger where Likud support was already higher.

*We would like to thank Laura Panza, Paul Raschky, Nick Tsivanidis, Christiane Szerman, Isabella Helter, Luiza Bellon, and seminar attendees at PUC-Rio for insightful comments. Any errors are our own.

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1 Introduction

Can terror threats influence voting behavior even when the terror act does not materialize? Does the heightened salience of national security just days before an election lead voters to shift their support toward parties perceived as strong on defense? Studying these questions empirically rigorously requires a situation where national security is made salient over time across locations, but holding constant actual damages from terrorist attacks. So far, such circumstances have not been found by the literature.

In this paper, we quantify how the salience of terror attacks impacts voting preferences in the context of the Israel-Hamas conflict. Since Hamas took control of the Gaza Strip in 2007, Israel has been regularly subjected to rocket attacks from Gaza. In response, the Israeli government has developed several defense mechanisms, the most prominent being the Iron Dome, a missile defense system that intercepts rockets with a success rate of over 90% (Kattan, 2018). Alongside this, a widespread siren alert system was established to provide immediate warnings of incoming rocket fire - “Red Alerts”. These sirens give residents critical time to seek shelter before the Iron Dome takes action, making them a vital component of Israel’s civilian defense. We introduce a novel dataset that tracks the timing and location of Red Alerts since 2014.

We examine whether exposure to sirens before elections influences voting behavior, specifically focusing on the vote share for the right-wing Likud party, the incumbent during the conflict. Using a difference-in-differences approach, we compare voting patterns in localities that experienced Red Alerts shortly before the election to those that did not. Our findings suggest a significant behavioral effect: exposure to Red Alerts in the days immediately before the election increases Likud’s vote share by approximately 2.9 p.p., or about 20% of the average. This effect is short-term, as localities that experienced alerts many days prior to the election did not show a significant change in voting behavior. Moreover, we find signs of increasing polarization. The effects of Red Alerts in the days immediately before the election are larger in areas with higher prior Likud vote share, while analogous does not hold for earlier Red Alerts.

The remainder of this paper proceeds as follows. [Section 2](#) provides a review of the relevant literature on the impact of rocket attacks on Israeli voting preferences, as well as salience theory. [Section 3](#) provides the political context for Israel during the 2014 war and outlines Israel’s defensive measures, detailing the functioning of the Red Alert siren system. [Section 5](#) introduces the data employed in this study. [Section 4](#) presents the empirical strategy. [Section 7](#) presents the main findings and discusses their implications. [Section 8](#) concludes with a summary of the key results.

2 Related Literature

The growing literature on salience theory provides a valuable framework for understanding how highly salient stimuli can distort decision-making by shifting attention to specific issues at the expense of others. As [Bordalo et al. \(2020, 2022\)](#) demonstrate, salient factors may lead voters to over-prioritize certain issues. Considering the election setting, [Webster and Albertson \(2022\)](#) shows that emotional responses to political events can polarize voter preferences and influence information processing. In our study, Red Alerts serve as the salient stimuli, potentially distorting voter preferences by overemphasizing security concerns and encouraging political shifts toward parties promising tougher stances on national security.

In Israel, studies examining the impact of terror attacks on voting patterns consistently find that targeted localities tend to shift politically to the right. The emphasis has been on the physical effects of rocket attacks, as opposed to our focus on *perceived* security threats. Although the relationship between rocket attacks and electoral outcomes is well documented, prior studies typically either include untargeted localities or exclude areas without direct attacks. For instance, [Getmansky and Zeitzoff \(2014\)](#) uses advancements in rocket technology to estimate the effect of being within rocket range on right-wing voting. However, Red Alert data shows that only about half of the localities within range in 2014 were actually targeted by the 2015 election, indicating that simply being within range may not fully capture the effect of the threat. Similarly, [Elster \(2019\)](#) assesses the impact of rocket fire through property damage claims, finding that affected areas tend to favor right-wing parties. Yet, as 90% of rockets are intercepted by the Iron Dome, focusing on material damage excludes many localities that endure the psychological threat of Red Alerts without experiencing physical harm. Likewise, [Berrebi and Klor \(2006, 2008\)](#) find that terrorist attacks increase support for right-wing parties, especially when incidents occur close to election dates or in right-leaning areas. These studies prioritize actual attacks rather than the perceived threat or psychological impact of Red Alerts, an element central to our analysis.

Considering the psychological effects of terrorism, the potential impact of perceived threats is explored by [Amarasinghe \(2023\)](#), who highlight that even unsuccessful terror attacks can heighten public discontent. Notably, countries with higher counter-terrorism exposure, like Israel, demonstrate less voter backlash, underscoring the importance of perceived government effectiveness in mitigating voter discontent, a concept that aligns with our focus on how Red Alerts influence electoral behavior through perceived threats. In a related context, [Hintson and Vaishnav \(2023\)](#) examine how national security crises impact elections in India, revealing complex effects on nationalist parties. In contrast to isolated attacks, our study considers the long-term exposure to security threats through frequent Red Alerts in Israel, enabling a deeper understanding of their psychological and electoral impacts by analyzing precise geographic and temporal variations in exposure to rocket fire.

This paper contributes to the existing literature by focusing on Red Alerts as a key factor influencing voting behavior, rather than just the physical impact of rocket attacks.

By analyzing the effects of perceived threat through alerts, we provide a more nuanced understanding of how exposure to terror influences electoral decisions, addressing the gap left by studies focused solely on direct attacks. Additionally, by applying insights from salience theory, we demonstrate how nonmaterial, psychological exposure to terror can distort voter preferences, broadening the scope of behavioral political economy in conflict settings.

3 Context

Since Hamas assumed control of Gaza in 2007, Israel has imposed a blockade on the region.¹ The ongoing threat of rocket strikes from Gaza has led Israel to heavily invest in defense, including the Iron Dome, an advanced aerial defense system with an intercept success rate of 90% (Kattan, 2018).²

The ongoing threat of terror attacks, especially rocket strikes from Gaza, has led the Israeli government to invest heavily in defense, including the development of the Iron Dome. The Iron Dome is an advanced aerial defense system capable of intercepting rockets and mortars mid-air, with an intercept success rate of approximately 90% (Kattan, 2018).³

Israel also employs a siren system, or “Red Alerts,” to warn localities of incoming rockets. These alerts instruct residents to seek shelter while the Iron Dome attempts interceptions.⁴ A single alert can cover multiple localities, and multiple rockets can trigger one alert, so alerts do not always correlate with the number of rockets fired.

The 2014 Israel-Hamas war, known as Operation Protective Edge, marked a significant escalation in hostilities between Israel and Hamas. The escalation began with the abduction and killing of three Israeli teenagers by Hamas members, followed by a period of intense rocket fire from Gaza into Israel. In response, Israel launched airstrikes targeting Hamas infrastructure, which eventually escalated into a full-scale ground operation aimed at dismantling Hamas’ military capabilities.

¹The broader Israel-Hamas conflict has significantly impacted Palestinian society, particularly in Gaza and the West Bank. During the Second Intifada (2000-2006), adverse effects included increased child labor, reduced school attendance (Di Maio and Nandi, 2013; Di Maio and Nisticò, 2019), lower birth weight (Mansour and Rees, 2012), labor market challenges (Di Maio and Sciabolazza, 2023), and deteriorating health indicators (Di Maio and Leone Sciabolazza, 2021).

²Israel’s defense systems include David’s Sling for medium-range threats and the Arrow System for long-range missiles. However, during 2013-2015, David’s Sling was not operational, and the Arrow System was unnecessary for the threats faced. The Iron Dome was the sole system used.

³Israel’s current defense infrastructure includes advanced missile defense systems like David’s Sling, designed for medium-range threats, and the Arrow System, which targets long-range ballistic missiles. However, during the 2013-2015 period, David’s Sling was not yet operational, and the Arrow System was not required for the types of threats Israel faced. The Iron Dome was the only one used in this context.

⁴“Locality” refers to any municipal unit recognized by the Israeli Ministry of Interior, including urban, rural, and local councils.

During the 2014 Israel-Hamas war, the range of rockets fired from Gaza expanded from 75 km to 150 km, endangering Israeli localities previously considered out of reach. Our analysis focuses on localities situated within the 75-150 km range, concentrating on those newly exposed to rocket fire during this period.

Localities within 75 km of the Gaza Strip were already within Hamas' rocket range before 2014, while those beyond 150 km remained out of reach during the 2014 conflict. As a result, only localities situated between 75 and 150 km were newly exposed to rocket fire - and Red Alerts - for the first time during the 2014 war.

During this period, we assume that all rocket fire directed at Israeli localities between 75 and 150 km originated from Gaza. Our research found no reports of attacks from other regions affecting this range, indicating that Red Alerts within this area were exclusively triggered by rockets from Gaza.⁵

We classify Israeli localities between 75 and 150 km from Gaza into categories: a control group and two treatment groups. The control group consists of localities that did not experience Red Alerts between the 2013 and 2015 legislative elections. The treatment groups include localities that were exposed to Red Alerts either 149-250 days before the 2015 election or within the six days leading up to the election. It should be noted that no alerts were issued in this range during the period between these two time windows. [Figure 1](#) illustrates this classification of localities on a map.

Despite extensive rocket attacks, only two Israeli civilians were killed during the conflict. This low casualty count is largely attributed to the success of the Iron Dome and Red Alert systems ([Kurz and Brom, 2014](#)).

On the political front, the right-wing Likud party, led by Benjamin Netanyahu, held power from 2009 to 2021 and regained it in 2023. Our study focuses on Likud's vote share, as its uninterrupted time in office under Netanyahu makes it a crucial indicator of political sentiment.

During the 2014 conflict, Netanyahu's popularity surged, with his approval rating climbing from below 50% to nearly 80% ([Feinstein, 2018](#)). We argue that exposure to Red Alerts significantly influenced voting behavior, resulting in higher support for Netanyahu and Likud in affected localities.

Israel, a parliamentary state, requires a coalition of 61 seats out of 120 to form a gov-

⁵While Hamas is the primary group launching rockets from Gaza, other organizations like Islamic Jihad also contribute to these attacks. Although Hezbollah (operating from Lebanon) and Iran have played roles in regional conflicts, our focus is solely on rockets fired from Gaza. There is no evidence to suggest that rockets from Lebanon, the West Bank, or other regions reached the 75-150 km range between 2013 and 2015. A thorough review of Israeli news reports revealed no incidents of rocket fire from these areas affecting localities within this range during this period. For example, Hezbollah typically targets northern Israel, beyond the 150 km distance from Gaza. While it is possible, though unlikely, that localities within the 75-150 km range could have been targeted before 2014, the available data does not support this. Even if such events occurred, civilians would have experienced the same Red Alert warnings, making the impact consistent.

ernment. In the 2013 elections, Likud's coalition was formed with 68 seats, which included a centrist party with 19 chairs. Likud's coalition held exactly 61 chairs in the 2015 election. This means that the impact of Red Alerts on voters' preferences since the 2014 war may have been decisive towards the formation of Likud's coalition.⁶

With such a narrow margin, even a slight shift in voter preferences could have prevented Likud from forming a government. In that case, alternative coalitions involving other parties would have been possible, potentially changing the direction of Israeli policy.

We argue that the role played by the siren alerts significantly influenced the electoral preferences of those affected by them, leading to a higher vote share for the Prime Minister's party Likud.

4 Empirical Strategy

Using an *difference-in-differences* approach, we analyze voting patterns in treated and untreated localities across multiple election cycles: 2006, 2009, and 2013 serve as the pre-treatment periods, occurring before these localities entered the range of rocket attacks from Gaza, while the 2015 election represents the post-treatment period, when they were within range.⁷

We exclude elections held after 2015 to maintain the clarity and consistency of our definition of treatment. In subsequent elections, both treated and untreated localities may experience additional Red Alerts at varying intervals, which would complicate the classification of the status and timing of treatment. For example, localities initially classified as untreated may become exposed to attacks closer to subsequent elections, thereby introducing new treatment instances that differ in timing. Similarly, previously treated localities may experience additional rounds of Red Alerts, with varying temporal proximity to each election. This variation in exposure over time makes it challenging to isolate a single treatment effect, as the influence of these alerts would likely differ according to how close to each election they occurred. By focusing exclusively on elections up to 2015, we ensure a consistent and interpretable comparison between the baseline (never having experienced Red Alerts) and the initial exposure to rocket alerts, allowing for a clearer assessment of their impact on voting behavior.⁸

The *difference-in-differences* analysis is estimated using a two-way fixed effects approach,

⁶In Israel's parliamentary system, local elections (e.g., for mayors) are held separately from national legislative elections. While legislative elections took place in 2013 and 2015, local elections were held in 2013 and 2018. As a result, our analysis focuses solely on legislative elections, as local elections were not concurrent.

⁷Israel is a parliamentary state. Therefore, the Prime Minister is the head of state, and is indirectly decided as a result of the legislative election.

⁸In the Appendix Figures ??, ??, and ?? we perform the analysis including all elections from 2006 to 2022. Results are qualitatively unchanged.

in an event-study framework, formulated as follows:

$$Likud_{i,t} = \gamma_i + \delta_t + \sum_{k \neq 2013} \beta_k \cdot RedAlert_i \cdot \mathbb{1}(Election_t = k) + \mathbf{X}_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $Likud_{i,t}$ represents the Likud vote share in locality i during election t ; $RedAlert_i$ is a categorical variable indicating whether locality i did not experience Red Alerts, experienced Red Alerts more than 149 days prior to the 2015 election, or experienced Red Alerts 6 days before the 2015 election.; β_k represents the coefficients associated with the interaction between the Red Alert variable and election years (excluding 2013, which is treated as the baseline period); γ_i represents the locality-level fixed-effects; δ_t is the election fixed-effects; $\mathbf{X}_{i,t}$ is a vector containing control variables for locality i during election t ; and $\varepsilon_{i,t}$ is the locality-clustered robust error term. The adopted control variables are demographic density, population size, and nighttime luminosity level (as a proxy of economic development).

Each β_k quantifies the effect of experiencing a Red Alert during election year k relative to the voting behavior observed in 2013. Specifically, we want to examine whether β_{2015} is statistically significant while β_{2006} and β_{2009} are not significantly different from zero. This would indicate parallel pre-trends in voting behavior, suggesting that localities with Red Alerts did not exhibit distinct voting patterns prior to 2015. At the same time, a significant difference for β_{2015} would imply that localities experiencing Red Alerts between 2013 and 2015 voted in a manner that was markedly different from the remaining localities only in the 2015 election.

We consider the occurrence of Red Alerts as exogenous to localities. The probability that a given locality will experience a Red Alert at any point in time is independent of whether it has experienced a Red Alert before. This exogeneity ensures that Red Alerts can be considered as an unexpected and random shock in our analysis. As such, since the occurrence of a Red Alert does not alter the future probability of Red Alerts, it should not systematically affect voting behavior through anticipation, allowing us to isolate its immediate salience on electoral preferences.

In addition to using Likud's vote share as a dependent variable, we extend our analysis to include the combined vote share of all right-wing parties excluding Likud.⁹ This broader measure allows us to capture any general changes in voter preferences towards right-wing parties in response to Red Alerts. By examining the right-wing bloc, we can assess whether the impact of Red Alerts is specific to Likud or reflects a wider ideological shift toward right-wing parties.

In addition, we also analyze voter turnout as a dependent variable to determine whether Red Alerts not only shape voter preferences but also influence electoral participation.¹⁰ This is key to understanding the broader political implications of security threats. An

⁹We follow established classifications in the literature to determine which parties are considered right-wing, applying consistent criteria to newer parties as well.

¹⁰Due to the unavailability of the number of registered voters by locality for the 2006 elections, we estimate this figure using the median percentage of registered voters from the elections held between 2009 and 2013.

increase in turnout could suggest that Red Alerts not only shift the preferences of existing voters, but also mobilize previously disengaged individuals, particularly those who feel more compelled to vote due to heightened security concerns. Conversely, if there is no effect on turnout but a change in vote shares, it would indicate that Red Alerts primarily sway the choices of those already inclined to vote, rather than expanding the pool of voters. By examining both vote shares and turnout, our aim is to provide a more complete understanding of how security threats shape electoral outcomes.

5 Data

We use a novel dataset consisting of Red Alert warnings issued by Israel’s military authority responsible for civil protection, the Home Front Command. When a rocket threat is detected, the Home Front Command not only activates sirens in the targeted areas, but also issues an online alert on their official website.¹¹ Through web scraping, we have compiled a comprehensive dataset of these alerts, spanning from July 2014 (the earliest available records) to the present. Each entry in the dataset contains the date of the alert and the locality or cluster of localities targeted. Non-rocket-related alerts, such as test alarms, were filtered out to focus solely on actual rocket attack warnings.

Information on the evolving range of rockets fired from the Gaza Strip was obtained from the Israeli Ministry of Foreign Affairs.¹²

Locality-level demographic information was sourced from the Israeli Central Bureau of Statistics, capturing variables such as total area, population size and primary religion. Additionally, we use harmonized nighttime luminosity as a proxy to the level of economic development (Henderson et al., 2012; Li et al., 2020).

Lastly, the number of votes per party for each locality was extracted from the records of the Israeli Central Elections Committee.

We exclude Arab localities from our main analysis. These areas are rarely targeted, resulting in the absence of Red Alerts. Furthermore, their voting patterns differ significantly from those of other localities, making them unsuitable for inclusion in the control group. These localities account for only 14% of the areas located between 75 and 150 km from the Gaza Strip.¹³

¹¹Link: <https://www.oref.org.il>.

¹²Link: <https://www.gov.il/en/pages/range-of-fire-from-gaza>.

¹³In the Appendix, we perform the analysis without excluding Arab localities. Results are similar in both magnitude and statistical significance.

6 Descriptive Statistics

Following the empirical strategy detailed in [Section 4](#), we are able to examine the voting pattern evolution each group, as well as their demographic variables. [Table 1](#) presents the relevant descriptive statistics for each group.

It is clear that the three groups presented similar voting patterns in 2013, concerning Likud's vote share, the right-wing block's vote share, and the population turnout. In addition, they are typically small in terms of area, and, although the mean distance to the Gaza Strip varies between groups, the average time to seek shelter after a Red Alert is virtually the same for all localities.

However, it is worth noticing that the group of localities that experienced Red Alerts 6 days before the 2015 election are considerably different from the other two groups in terms of population size and density. In fact, these localities tend to be smaller in population size, less dense, and more distant from Gaza. The night lights level is also lower, indicating also lower economic development.

[Figure 2](#) compares the share of Likud votes between the three groups over time. Before the 2015 election (period 0), the three groups presented parallel trends. However, in 2015, the localities that experienced Red Alerts 6 days before the election presented, on average, a much higher share of votes to Likud.¹⁴

Following the empirical strategy outlined in [Section 4](#), we compare the 2013 and 2015 voting patterns and demographic characteristics across groups. [Table 1](#) presents the relevant descriptive statistics for each group.

The three groups showed similar voting patterns in 2013, including Likud's vote share, the right-wing bloc's vote share, and voter turnout. In addition, all groups are relatively small in area. Although the average distance to the Gaza Strip varies, the time to reach shelter after a Red Alert is similar in all localities.

Notably, the group of localities experiencing Red Alerts 6 days before the 2015 election differs significantly from the other two groups in population size and density. These localities tend to be smaller, less densely populated, and exhibit lower night light intensity, indicating a lower level of economic development.

These characteristics support the argument for the exogeneity of Red Alerts in this context. Smaller, less densely populated localities are not particularly attractive targets if Hamas sought to maximize impact or casualties, as more densely populated areas would present more significant opportunities for damage. Additionally, voting patterns were nearly identical across groups in 2013, indicating no systematic pre-existing political differences among these localities. This suggests that Red Alerts are unlikely to be strategically directed based on local socioeconomic or political factors,

¹⁴On the Appendix, we present similar figures that compare the share of Right Wing parties' (excluding Likud) vote share and turnout between these groups.

strengthening the case for treating the alerts as an exogenous shock in assessing their impact on voting behavior.

Figure 2 illustrates the evolution of Likud's vote share across the three groups. Before the 2015 election (period -1), the groups showed parallel trends. However, in 2015, localities that experienced Red Alerts 6 days before the election showed a significantly higher average vote share for Likud.

7 Results

We present the regression results of the difference-in-differences estimator in Table 2. The first line measures the effect of Red Alerts occurring six days before the 2015 election, while the second line assesses the impact of alerts issued more than 149 days before the election.

Columns (1) and (2) analyze Likud's vote share, columns (3) and (4) focus on the right-wing vote share, and columns (5) and (6) evaluate voter turnout. The analysis reveals that Red Alerts occurring six days before the election have a statistically significant positive effect on Likud's vote share in the post-election period, with coefficients of 2.9% and 3.0% in columns (1) and (2), both significant at the 0.1% level. Experiencing a Red Alert 6 days before the 2015 election led to an additional 2.9 percentage points for Likud, on average.

For localities treated 6 days before the election, where Likud's average vote share in 2013 was 14.7%, the impact of Red Alerts reflects a relative increase in vote share.¹⁵

Since the Israeli parliament has 120 chairs, an additional 2.9 percentage points would translate to about 3.5 seats if linearly extrapolated. In contrast, Red Alerts occurring more than 149 days before the 2015 election do not significantly affect Likud's vote share.

These patterns suggest that in times of security threats, Likud is uniquely positioned to capture and even expand its voter base, possibly at the expense of its smaller right-wing counterparts. This dynamic underscores Likud's advantage in an electoral landscape marked by security concerns.

The results in Table 2 suggest that the impact of Red Alerts on the incumbent's vote share is short-term.

The significant effect of alerts just six days before the election on Likud's vote share indicates that these alerts raise security concerns, pushing voters to favor the incumbent. However, we cannot determine the origin of Likud's new votes, i.e., whether they came from voters that previously supported right-wing or left-wing parties.

¹⁵Notice that $2.9\% / 14.7\% \approx 19.96\%$.

Additionally, a key limitation in interpreting these results is the challenge in separating the incumbency effect (rally-around-the-flag) from the salience effect. In the rally-around-the-flag phenomenon, external threats lead voters to support the incumbent government, simply because it is in power during the crisis. In the 2015 election, Likud was the incumbent, so heightened security concerns from Red Alerts may have triggered this response. At the same time, the salience effect could be at play, where voters prioritize security issues, favoring Likud for its strong defense policies. As a result, we cannot empirically determine whether the shift in support was due to voters rallying around the incumbent or due to a genuine increase in the salience of security concerns.

Conversely, the remaining right-wing parties are negatively affected by the Red Alerts, as shown in columns (3) and (4). This supports the argument that Likud's electoral gains may stem more from heightened security concerns than from a genuine ideological shift among voters. In fact, localities exposed to Red Alerts, both six days and over 149 days before the 2015 election, show significantly lower support for other right-wing parties.

As Likud was in power during the alerts, voters may associate the party with the handling of security threats like rocket attacks, the effectiveness of the Iron Dome system, and the use of sirens. These factors, rather than purely political ideology, may explain the increased support for Likud during periods of heightened security concerns.

Likud was the party in power during the Red Alerts, perceived as stronger on defense and national security. This heightened security concern likely fades over time, as evidenced by the lack of a significant effect of the Red Alerts that occurred more than 149 days before the election. The lack of a long-term impact suggests voters' responses are driven by recent experiences, not past events, even if similarly threatening. At the same time, the negative long-term impact on other right-wing parties may stem from voter perceptions that these parties lack the same level of competence or decisiveness in crisis situation. Additionally, as the immediate security concerns fade, voters might become disillusioned with the broader right-wing agenda if they feel that other parties are not effectively contributing to national security discussions.

The results in [Table 2](#) also indicate that there is no significant impact of Red Alerts on voter turnout at the 5% significance level. Despite the increased security concerns following the alerts, there is no evidence to suggest that these events motivated more voters to participate in the election. This absence of a turnout effect underscores that Red Alerts shape voter preferences rather than mobilize new voters. This reinforces the idea that the shift towards Likud is more about concerns over security and leadership than broader ideological or political realignment across the electorate.

The possibility of an alternative hypothesis concerning the turnout cannot be entirely dismissed, namely that Red Alerts might lead to an increase in voter turnout among right-wing voters while simultaneously discouraging turnout among left-wing voters. In this scenario, heightened security concerns could motivate right-leaning individuals to cast their ballots in support of Likud, perceiving it as better equipped to handle

national security threats. Conversely, left-leaning voters could be less inclined to participate. This dynamic could contribute to the observed shift in election outcomes without necessarily reflecting a broad change in ideological preferences, but rather a turnout imbalance driven by divergent reactions to the perceived threat of terrorism.

This short-term effect aligns with how salience shapes voter behavior: security concerns are most acute when threats are fresh, prompting shifts toward parties emphasizing security. Over time, as the immediacy of the threat diminishes and other issues come to the forefront, the influence of past security events wanes. Therefore, while Red Alerts shortly before an election can significantly sway voter preferences, this effect seems to dissipate relatively quickly, indicating that such events are likely to have only a transient impact on electoral outcomes.

7.1 Polarization

This analysis explores the heterogeneous impact of Red Alerts on Likud's vote share, Right-Wing parties' vote share (excluding Likud), and voter turnout across localities with varying levels of previous support for Likud. Localities are categorized by whether their baseline Likud vote share in the 2013 election falls within or above the 60th, 70th, or 80th percentiles. This grouping allows us to capture differences in Red Alert effects across areas with moderate to very high baseline Likud support, which might exhibit varying sensitivity to security threats.

[Table 3](#) presents the difference-in-differences estimates across these percentile groups, specifying the impact of Red Alerts that occurred either 6 days or 149+ days before the 2015 election. The following sections describe the impact on Likud's vote share, the vote share of other Right-Wing parties (excluding Likud), and voter turnout in these localities.

Columns (1) through (3) reveal a positive and increasing effect on Likud's vote share in localities with progressively higher baseline support, with the impact of Red Alerts intensifying as we move from the 60th to the 80th percentile. Specifically, in localities at or above the 60th percentile of Likud support, a Red Alert within 6 days of the election increases Likud's vote share by 6.0 percentage points. This effect grows in magnitude in localities with even stronger baseline support, reaching an increase of 8.2 percentage points in the 70th percentile and 9.4 percentage points in the 80th percentile.

Considering the mean Likud vote share in 2013 across these groups – 27.9% for the 60th percentile and above, 33.1% for the 70th and above, and 37.1% for the 80th percentile and above – the relative impact also increases in percentage terms. Dividing the observed effects by these baseline levels, we find an average effect of approximately 21.7% for the 60th percentile, 24.8% for the 70th percentile, and 25.4% for the 80th percentile groups. This shows that not only does the impact of Red Alerts grow in absolute percentage points, but it also represents a larger proportional shift in Likud's vote share as baseline support intensifies. In contrast, Red Alerts occurring over 149

days before the election yield a much smaller, generally insignificant effect on Likud's vote share across all groups.

This trend points to increasing polarization: the more a locality already supported Likud, the more likely it was to increase that support in response to Red Alerts close to the election. As Red Alerts intensify support in areas where Likud already has a strong base, these effects contribute to a growing divide between localities with high baseline support for Likud and those with less, reinforcing existing political preferences rather than broadening appeal across varied localities.

The results in columns (4) through (6) highlight a decrease in vote share for other Right-Wing parties, excluding Likud, when a recent Red Alert occurs. In the 60th percentile and above group, a Red Alert within 6 days of the election reduces other right-wing vote share by 4.2 percentage points, with progressively higher reductions observed in the 70th and 80th percentiles. These findings suggest a consolidation of right-wing support around Likud in response to immediate security threats, as voters may increasingly view Likud as the primary defender of security interests. However, it remains unclear whether Likud's gains come directly at the expense of these other right-wing parties or if Likud is also attracting new voters. Consequently, while the results indicate a shift in the right-wing vote toward Likud, they do not clarify whether the lost vote share for other right-wing parties translates directly into Likud's gains.

The proportional impact of Red Alerts on other right-wing parties' vote share also intensifies across the baseline support percentiles, reinforcing the idea of a concentrated shift toward Likud. In localities at or above the 60th percentile, where the average vote share for other right-wing parties was 25.6% in 2013, the reduction of 4.2 percentage points from a recent Red Alert represents a decline of roughly 16.5%. In the 70th percentile, where the mean was 24.8%, a similar reduction translates to a 20.0% decline in support for these parties. In the 80th percentile and above, with an average 2013 vote share of 29.4%, the decrease represents an impact of 22.8%. These results indicate that, on average, Red Alerts drive a progressively larger shift away from other right-wing parties as the baseline Likud support increases, suggesting that immediate security concerns not only consolidate the right-wing vote but do so in a way that increasingly centralizes support around Likud in localities with higher existing levels of support for the party.

Columns (7) through (9) show increased turnout after recent Red Alerts, especially in high-support localities, with increases of 3.4 to 4.8 percentage points across the percentiles. The proportional impact of recent Red Alerts on turnout also increases with higher baseline Likud support. In the 60th percentile group, where the mean turnout for 2013 was 70.5%, a recent Red Alert increases the turnout by 4.8%. This effect increases to 6.5% in the 70th percentile (67.8% baseline) and 7.4% in the 80th percentile (65.7% baseline). These results suggest that Red Alerts mobilize turnout more strongly in areas with higher Likud support, potentially boosting the representation of Likud's base.

8 Conclusion

This study illustrates the significant impact of immediate security threats on electoral outcomes in Israel, specifically through the lens of the siren alert system. Our findings indicate that exposure to Red Alerts prior to elections can influence voters to favor the incumbent party, which they associate with providing protection during periods of conflict. This relationship underscores the critical role that perceived security risks play in shaping political behavior and voter preferences.

Furthermore, the mainly short-term nature of the behavioral effect observed in our analysis suggests that voters are primarily influenced by recent experiences of threat rather than long-standing conditions. Localities that experienced alerts at a considerable temporal distance from the election did not demonstrate significant changes in voting behavior towards the incumbent party. The observed short-term effect of these alerts emphasizes that the impact on electoral outcomes is not merely a reflection of general security sentiments but rather a specific reaction to recent experiences of threat.

Ultimately, this study contributes to a broader understanding of how contextual factors, particularly salient security threats, influence agent behavior. By analyzing the intersection of rocket attacks, Red Alerts, and voting patterns, we highlight the role of immediate environmental stimuli in shaping electoral preferences.

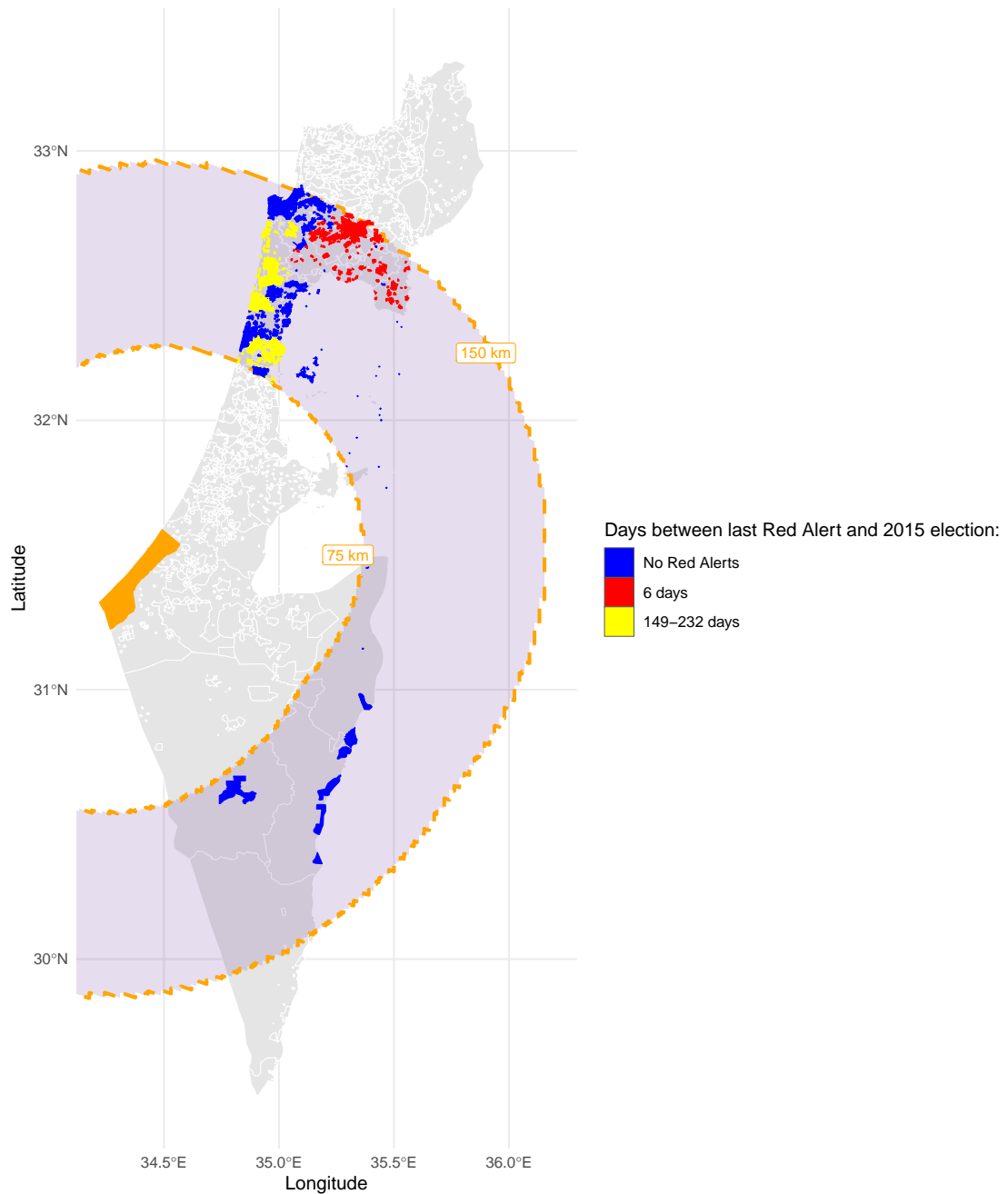
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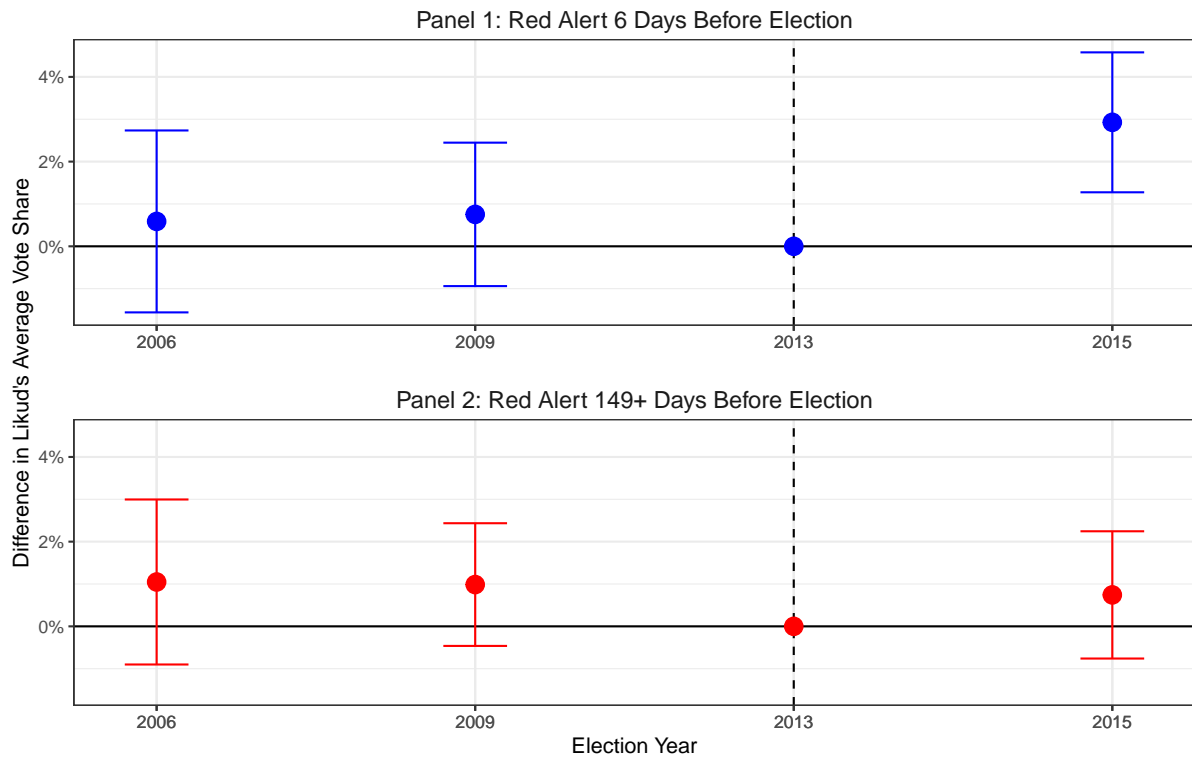
Figures and Tables

Figure 1: Red Alerts in Israel based on Distance to 2015's Election: 75-150km from the Gaza Strip



Notes: The map displays Red Alerts in Israel, highlighting only alerts occurring between 75-150 km from the Gaza Strip (shown in orange). The different colors indicate the temporal distance between the last Red Alert experienced by each locality and the 2015 Legislative Election. Gray areas within the 75-150 km range are either partially out of range, Arab localities, or non-jurisdictional areas. *Source:* Israel's Home Front Command.

Figure 2: Difference in Likud's Vote Share Over Time



Notes: Error bars represent 95% confidence intervals. Panel 1 compares Likud's average vote share between localities with a Red Alert 6 days before the 2015 election and those with no alerts leading up to the election. Panel 2 presents the differences in Likud's vote share between localities that experienced a Red Alert 149 days or more before the 2015 election and those with no alerts. For both panels, the 2013 election (period -1) serves as the reference period, normalizing the differences in vote share to zero in 2013. Election numbers are as follows: 0 for the 2015 election, -1 for 2013, -2 for 2009, and -3 for 2006.

Table 1: Descriptive Statistics by Groups of Interest for 2013

Statistic	No Red Alerts (1) 2013	Last Red Alert 149+ Days Before (2) (3) 2013 Diff (vs No Red Alerts)		Last Red Alert 6 Days Before (4) (5) 2013 Diff (vs No Red Alerts)	
Likud's Vote Share (%)	15.47 (11.51)	15.92 (10.52)	0.45 (1.57)	16.40 (13.50)	0.93 (1.70)
Right Wing Vote Share (%)	30.33 (24.71)	27.18 (19.60)	-3.15 (3.12)	32.49 (27.94)	2.16 (3.56)
Turnout (%)	73.31 (10.15)	74.40 (9.01)	1.09 (1.36)	72.56 (7.39)	-0.75 (1.16)
Night Lights (0-63)	52.14 (17.01)	55.87 (11.23)	3.73+ (1.96)	44.07 (14.56)	-8.07*** (2.09)
Population Size	6972.48 (30201.29)	4781.20 (14617.79)	-2191.28 (3115.62)	2305.05 (6791.77)	-4667.43+ (2708.06)
Population Density (per km ²)	1702.77 (1806.25)	3986.70 (19477.63)	2283.93 (2254.53)	1110.42 (980.23)	-592.35** (185.57)
Area (km ²)	3.83 (9.98)	3.03 (7.53)	-0.80 (1.23)	2.22 (4.79)	-1.61 (0.99)
Distance to Gaza (km)	107.55 (20.73)	97.11 (19.17)	-10.44 (2.85)	134.76 (6.86)	27.21*** (1.93)
Observations	144	69		93	

Notes: Statistical significance is reported for columns (3) and (5), which represent the differences between each treatment group and the No Red Alerts control group. The symbols denote significance levels as follows: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. "No Red Alerts" comprises the localities that experienced no Red Alerts between the 2013 and 2015 Legislative Elections. "Last Red Alert 149+ Days Before" comprises the localities that experienced their last Red Alert 149+ days before the 2015 Legislative Election. "Last Red Alert 6 Days Before" comprises the localities that experienced their last Red Alerts 6 days before the 2015 Legislative Election. Robust standard errors clustered at locality level are reported in parentheses.

Table 2: Differences-in-Differences Estimates: Red Alert Impact on Likud's vote share, Right Wing's vote share and Turnout

	(1)	(2)	(3)	(4)	(5)	(6)
Red Alert 6 Days Before * 2015 Election	0.029*** (0.008)	0.030*** (0.009)	-0.021* (0.008)	-0.021* (0.009)	0.003 (0.005)	0.002 (0.005)
Red Alert 149+ Days Before * 2015 Election	0.007 (0.008)	0.009 (0.008)	-0.027** (0.009)	-0.026** (0.008)	0.008+ (0.004)	0.009+ (0.004)
Red Alert 6 Days Before * 2009 Election	0.008 (0.009)	0.006 (0.009)	-0.015 (0.011)	-0.014 (0.011)	-0.003 (0.007)	-0.003 (0.007)
Red Alert 149+ Days Before * 2009 Election	0.010 (0.007)	0.009 (0.007)	-0.011 (0.011)	-0.013 (0.010)	0.004 (0.007)	0.004 (0.007)
Red Alert 6 Days Before * 2006 Election	0.006 (0.011)	0.004 (0.011)	-0.016 (0.011)	-0.015 (0.011)	0.024 (0.016)	0.025 (0.016)
Red Alert 149+ Days Before * 2006 Election	0.010 (0.010)	0.009 (0.010)	-0.010 (0.009)	-0.013 (0.010)	-0.009 (0.016)	-0.010 (0.016)
Dependent Variable	Likud	Likud	Right Wing (excluding Likud)	Right Wing (excluding Likud)	Turnout	Turnout
Control Variables	No	Yes	No	Yes	No	Yes
Locality Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustered Errors	Yes	Yes	Yes	Yes	Yes	Yes
Control Group	NRA 2015	NRA 2015	NRA 2015	NRA 2015	NRA 2015	NRA 2015
Observations	1180	1180	1180	1180	1180	1180

Notes: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Robust standard errors clustered at locality level are reported in parentheses.

NRA 2015 stands for No Red Alerts until the 2015 Election.

Columns (1) and (2) estimate the impact of Red Alerts on Likud's vote share, columns (3) and (4) estimate the impact on Right-Wing parties' vote share (excluding Likud), and columns (5) and (6) estimate the impact on voter turnout.

"Red Alert 6 Days Before" indicates localities that experienced their last Red Alert 6 days before the 2015 Legislative Election.

"Red Alert 149+ Days Before" indicates localities that experienced their last Red Alert 149+ days before the 2015 Legislative Election.

Control variables: demographic density, population size and nighttime luminosity level (as a proxy to economic development).

Table 3: Differences-in-Differences Estimates based on Likud's 2013 Vote Share

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
60th percentile - 6 days - 2015	0.060*** (0.013)			-0.042** (0.013)			0.034*** (0.007)		
60th percentile - 149+ days - 2015	0.025* (0.012)			-0.029* (0.014)			0.017* (0.007)		
70th percentile - 6 days - 2015		0.082*** (0.016)			-0.050** (0.018)			0.044*** (0.008)	
70th percentile - 149+ days - 2015		0.011 (0.013)			-0.018 (0.015)			0.015* (0.007)	
80th percentile - 6 days - 2015			0.094*** (0.020)			-0.067** (0.022)			0.048*** (0.009)
80th percentile - 149+ days - 2015			0.023 (0.023)			-0.034 (0.025)			0.022* (0.010)
Dependent Variable	Likud	Likud	Likud	Right Wing (excluding Likud)	Right Wing (excluding Likud)	Right Wing (excluding Likud)	Turnout	Turnout	Turnout

Notes: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Robust standard errors clustered at locality level are reported in parentheses.

Columns (1), (2) and (3) estimate the impact of Red Alerts on Likud's vote share, columns (4), (5) and (6) estimate the impact on Right-Wing parties' vote share (excluding Likud), and columns (7), (8) and (9) estimate the impact on voter turnout.

"Xth percentile - Y days - 2015" indicates the effect of experiencing a Red Alert in localities where baseline Likud support is in the top Xth percentile, and the Red Alert occurs Y days before the 2015 election.

Control variables: demographic density, population size and nighttime luminosity level (as a proxy to economic development).

Supplemental Appendix - Echoes of Terrorism: Examining the Effects of Siren Alerts Timing on Voter Preferences in Israel

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November 20, 2024

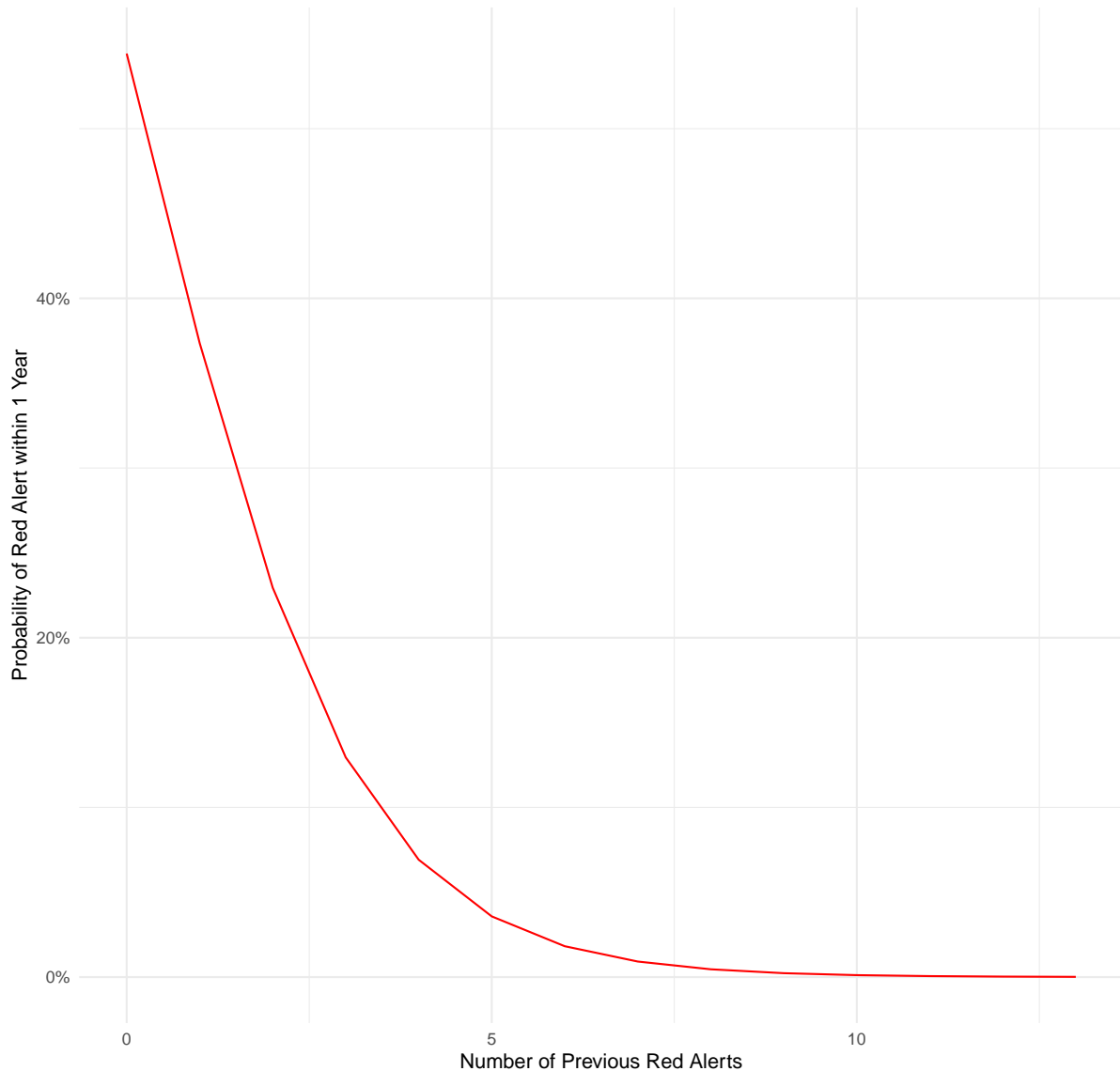
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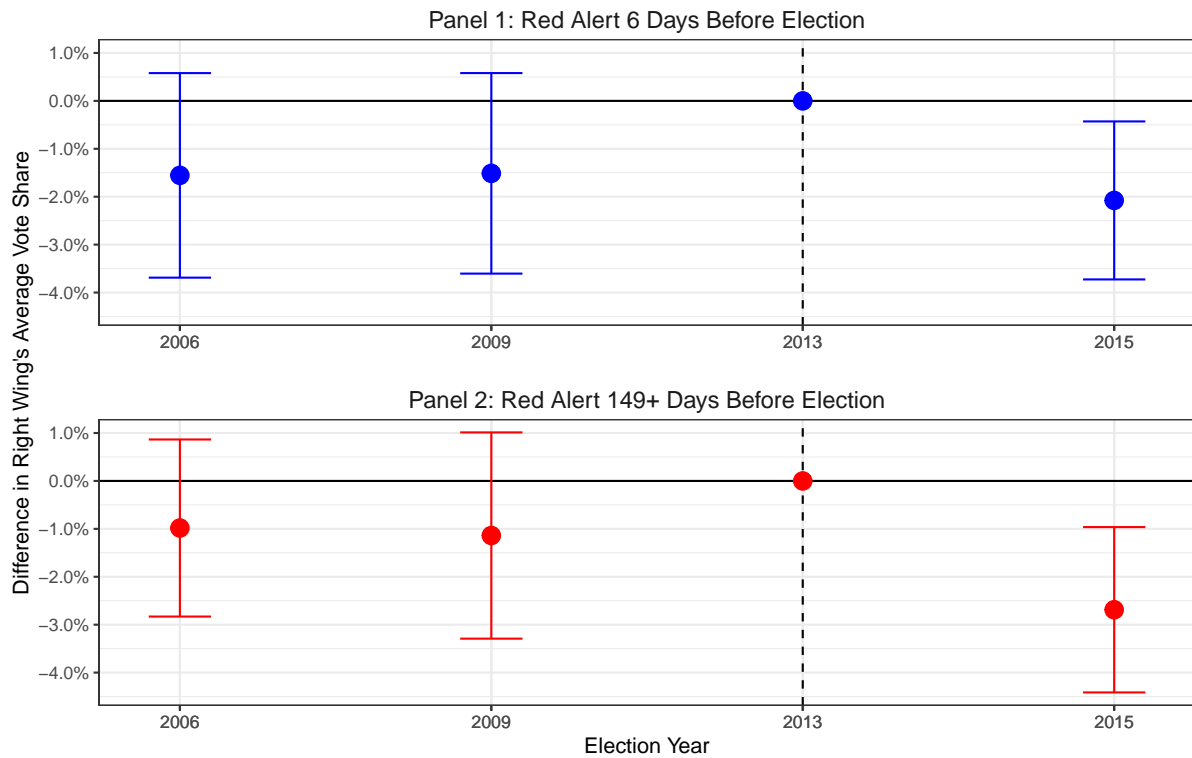
A Appendix

Figure A1: Probability of Red Alert on the Following Year Conditional to Number of Previous Red Alerts



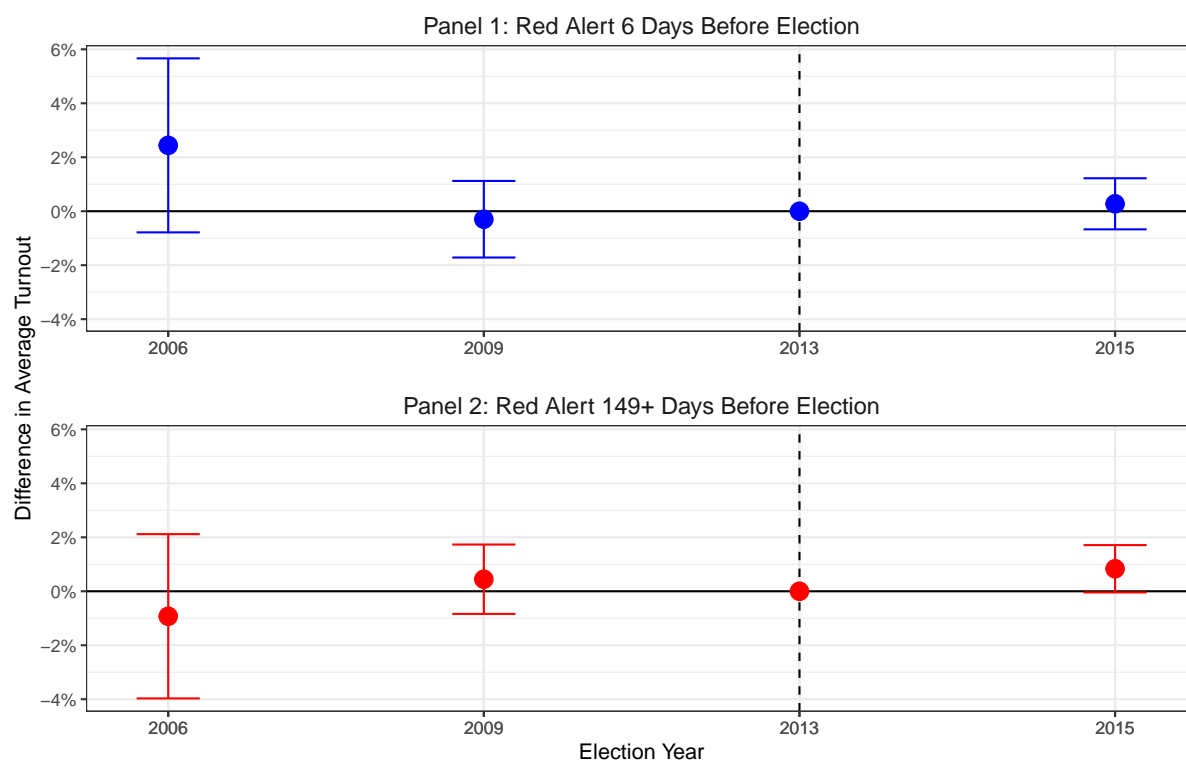
Notes: This graph shows a Logit model estimating the conditional probability that a locality situated 75-150 km from the Gaza Strip will experience a red alert within the next year, based on the number of prior alerts. The analysis spans 2014 to 2022 and reveals how the frequency of past alerts impacts future alert likelihood over time. The x-axis represents the cumulative count of past alerts, while the y-axis indicates the probability of a future alert within 365 days.

Figure A2: Difference in Right Wing bloc's Vote Share Over Time



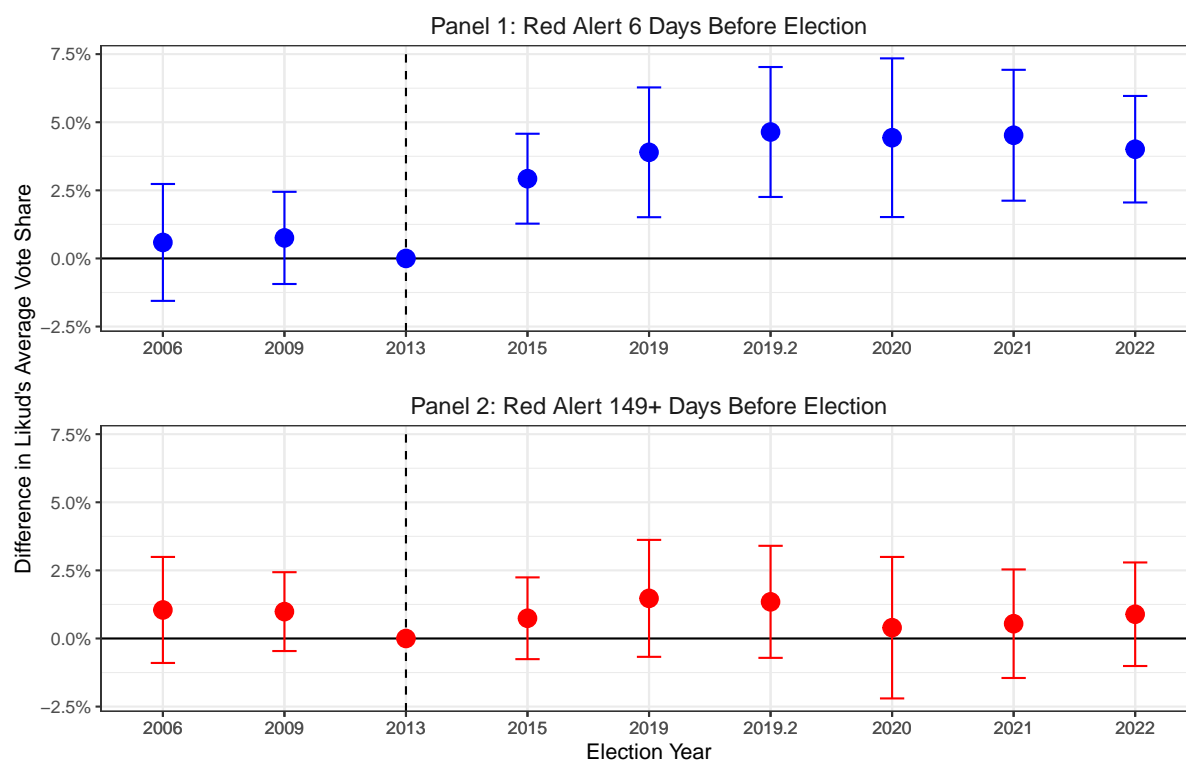
Notes: Error bars represent 95% confidence intervals. Panel 1 compares the Right Wing Bloc's average vote share (excluding Likud) between localities with a Red Alert 6 days before the 2015 election and those with no alerts leading up to the election. Panel 2 presents the differences in the Right Wing Bloc's vote share (excluding Likud) between localities that experienced a Red Alert 149 days or more before the 2015 election and those with no alerts. For both panels, the 2013 election serves as the reference period, normalizing the differences in vote share to zero in 2013.

Figure A3: Difference in Turnout Over Time



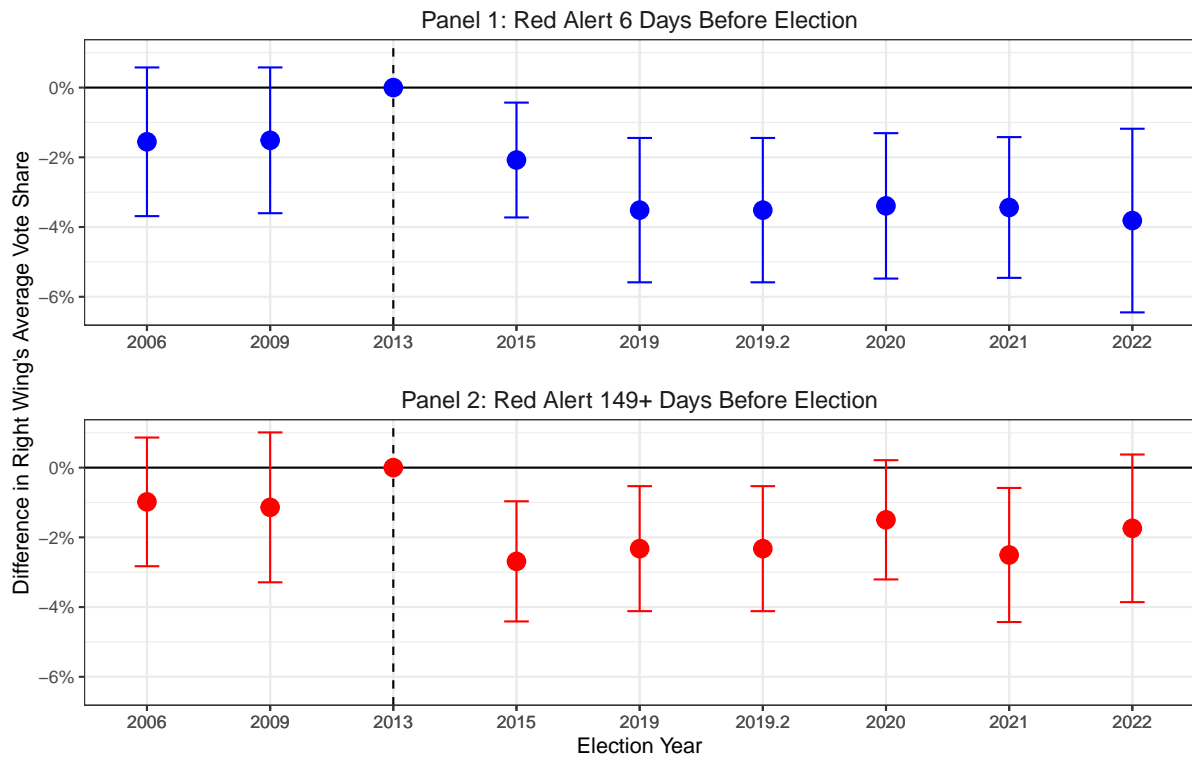
Notes: Error bars represent 95% confidence intervals. Panel 1 compares the average Turnout between localities with a Red Alert 6 days before the 2015 election and those with no alerts leading up to the election. Panel 2 presents the differences in Turnout between localities that experienced a Red Alert 149 days or more before the 2015 election and those with no alerts. For both panels, the 2013 election serves as the reference period, normalizing the differences in vote share to zero in 2013.

Figure A4: Difference in Likud's Vote Share Over Time (all years)



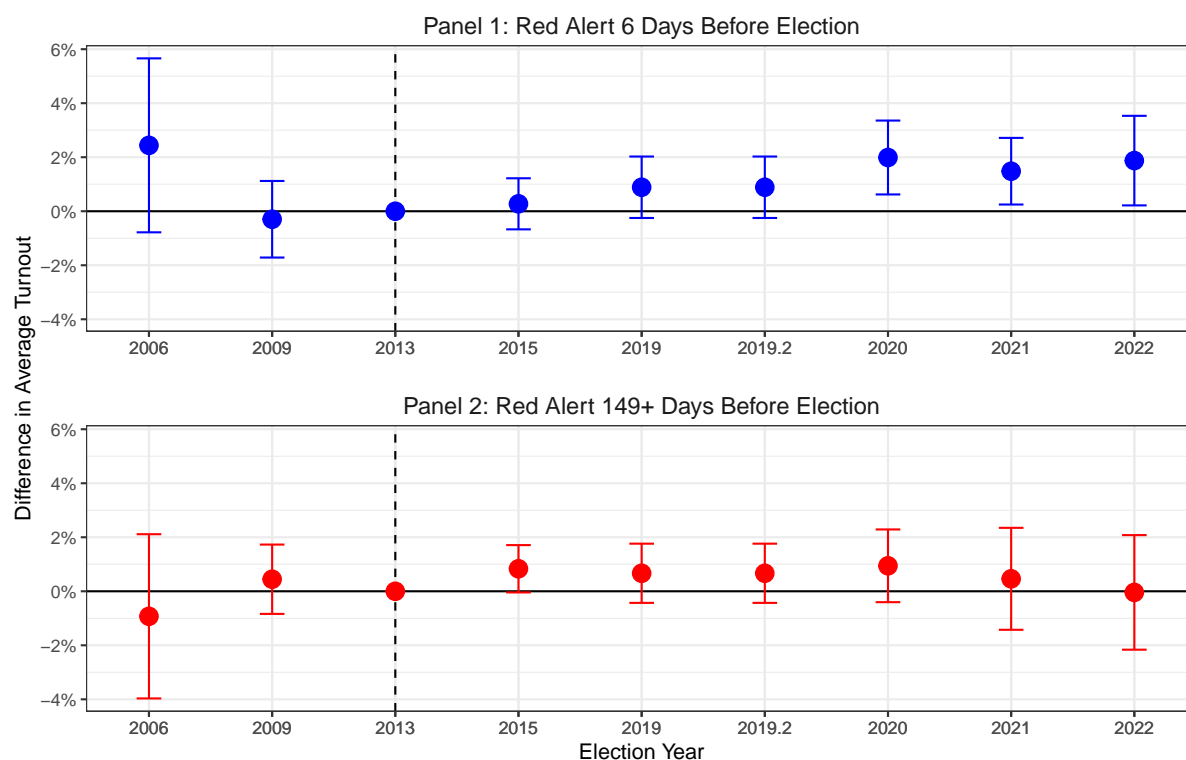
Notes: Error bars represent 95% confidence intervals. Panel 1 compares Likud's average vote share between localities with a Red Alert 6 days before the 2015 election and those with no alerts leading up to the election. Panel 2 presents the differences in Likud's vote share between localities that experienced a Red Alert 149 days or more before the 2015 election and those with no alerts. For both panels, the 2013 election serves as the reference period, normalizing the differences in vote share to zero in 2013. There were two elections in 2019: one in April (referenced as 2019) and other in September (referenced as 2019.2).

Figure A5: Difference in Right Wing bloc's Vote Share Over Time (all years)



Notes: Error bars represent 95% confidence intervals. Panel 1 compares the Right Wing Bloc's average vote share (excluding Likud) between localities with a Red Alert 6 days before the 2015 election and those with no alerts leading up to the election. Panel 2 presents the differences in the Right Wing Bloc's vote share (excluding Likud) between localities that experienced a Red Alert 149 days or more before the 2015 election and those with no alerts. For both panels, the 2013 election serves as the reference period, normalizing the differences in vote share to zero in 2013. There were two elections in 2019: one in April (referenced as 2019) and other in September (referenced as 2019.2).

Figure A6: Difference in Turnout Over Time (all years)



Notes: Error bars represent 95% confidence intervals. Panel 1 compares the average Turnout between localities with a Red Alert 6 days before the 2015 election and those with no alerts leading up to the election. Panel 2 presents the differences in Turnout between localities that experienced a Red Alert 149 days or more before the 2015 election and those with no alerts. For both panels, the 2013 election serves as the reference period, normalizing the differences in vote share to zero in 2013. There were two elections in 2019: one in April (referenced as 2019) and other in September (referenced as 2019.2).

Table A1: Differences-in-Differences Estimates Including Arab Cities: Red Alert Impact on Likud's vote share, Right Wing's vote share and Turnout

	(1)	(2)	(3)	(4)	(5)	(6)
Red Alert 6 Days Before * 2015 Election	0.026*** (0.008)	0.027*** (0.008)	-0.013+ (0.008)	-0.012 (0.008)	0.007 (0.007)	0.005 (0.007)
Red Alert 149+ Days Before * 2015 Election	0.008 (0.007)	0.009 (0.007)	-0.016+ (0.009)	-0.016* (0.008)	0.008 (0.007)	0.010 (0.007)
Red Alert 6 Days Before * 2009 Election	0.007 (0.008)	0.007 (0.008)	-0.009 (0.010)	-0.009 (0.010)	-0.002 (0.007)	-0.002 (0.007)
Red Alert 149+ Days Before * 2009 Election	0.009 (0.007)	0.009 (0.007)	-0.001 (0.011)	-0.004 (0.009)	0.002 (0.007)	0.003 (0.007)
Red Alert 6 Days Before * 2006 Election	0.006 (0.010)	0.006 (0.010)	-0.013 (0.010)	-0.015 (0.010)	0.018 (0.015)	0.020 (0.015)
Red Alert 149+ Days Before * 2006 Election	0.002 (0.009)	0.002 (0.009)	-0.007 (0.009)	-0.011 (0.009)	-0.009 (0.015)	-0.010 (0.015)
Dependent Variable	Likud	Likud	Right Wing (excluding Likud)	Right Wing (excluding Likud)	Turnout	Turnout
Control Variables	No	Yes	No	Yes	No	Yes
Locality Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustered Errors	Yes	Yes	Yes	Yes	Yes	Yes
Control Group	NRA 2015	NRA 2015	NRA 2015	NRA 2015	NRA 2015	NRA 2015
Observations	1348	1348	1348	1348	1348	1348

Notes: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Robust standard errors clustered at locality level are reported in parentheses.

NRA 2015 stands for No Red Alerts until the 2015 Election.

Columns (1) and (2) estimate the impact of Red Alerts on Likud's vote share, columns (3) and (4) estimate the impact on Right-Wing parties' vote share (excluding Likud), and columns (5) and (6) estimate the impact on voter turnout.

"Red Alert 6 Days Before" indicates localities that experienced their last Red Alert 6 days before the 2015 Legislative Election.

"Red Alert 149+ Days Before" indicates localities that experienced their last Red Alert 149+ days before the 2015 Legislative Election.

Control variables: demographic density, population size and nighttime luminosity level (as a proxy to economic development).