# On Terrorism and Electoral Outcomes: Theory and Evidence from the Israeli-Palestinian Conflict

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## Abstract

This paper investigates the interaction between terror attacks and electoral outcomes in Israel. We analyze a dynamic model of reputation that captures the salient characteristics of this conflict. The equilibrium of the theoretical model generates two precise empirical predictions about the interaction between terrorism and electoral outcomes. First, we expect the relative support for the right-wing party to increase after periods with high levels of terrorism and to decrease after periods of relative calm. Second, the expected level of terrorism is higher when the left-wing party is in office than it is during the term of the right-wing party. We test these hypotheses by using a newly created data set on terrorist attacks in Israel between 1990 and 2003. The first hypothesis is strongly supported by data culled from public opinion polls about the Israeli electorate's political preferences. We use event study methods and likelihood ratio tests to evaluate the second hypothesis, since electoral outcomes are endogenous to the level of terror attacks. The results support our theoretical prediction for three of the four Israeli governments that served during the studied time period, i.e., terror attacks escalated when left-wing governments served and decreased during the terms in office of right-wing governments.

**On Terrorism and Electoral Outcomes: Theory and Evidence from the Israeli-Palestinian Conflict**[1]

## 1. Introduction

Three hundred and ninety terror attacks resulted in more than a thousand Israeli fatal casualties between November 1991 (when the Madrid Peace Conference formally initiated the peace process) and October 15, 2003. Despite its large toll in human lives, however, the Israeli-Palestinian conflict has not been characterized by continuous and uninterrupted violence. Instead, this conflict exhibits marked fluctuation between periods of relative calm followed by cycles of bloodshed. At the present writing, the conflict is going through an extremely violent period plagued with attacks and retaliations. This latest cycle of violence, which began in September 2000, was preceded, however, by three very quiet years in terms of fatalities—an era that itself was preceded by a violent term that began in 1994, ending the quiet years that followed the first *intifada* (Palestinian uprising).[2]

The number of fatalities is not the only variable that has behaved cyclically since the onset of the peace process. The political affiliation of the Israeli prime minister seems to sway from right-wing to left-wing and back whenever the office is up for grabs. In the studied period, a Likud government led by Yitzhak Shamir was replaced in 1992 by a Labor government led by Yitzhak Rabin. This Labor government, in turn, was replaced

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[2] A description of our data set, containing a precise definition of terror attacks and fatalities, appears in Subsection (3.1). Figure 1 depicts the monthly number of Israeli civilian fatalities during the period at issue.

by a Likud government under Benjamin Netanyahu in 1996, which lost the 1999 elections to Ehud Barak of the Labor party. Finally, Barak was defeated in 2001 by Ariel Sharon of the Likud. While the possibility that the level of terrorism might influence electoral outcomes was already mentioned in the Israeli popular press (*Yediot Aharonot*, January 10, 2003), the previous description of events suggests that electoral outcomes influence the level of terrorism as well, thereby creating an interaction between the two variables.

This paper investigates, theoretically and empirically, the dynamic interaction between electoral outcomes and terrorism through the prism of the Israeli-Palestinian conflict. This conflict is especially suited to conduct such a study for several reasons. Occupation of territories and terrorism are Israel's most salient issues. Democratic elections are held periodically and political parties' positions on the occupied territories are fairly well known to voters and terrorists alike. Consequently, this case study is likely to expose any empirical relationship that exists between terrorism and electoral outcomes.

We analyze a dynamic model of reputation that captures the salient characteristics of the conflict. In particular, we develop a game in which nature chooses *ab initio* the identity of the Palestinian organization responsible for terror attacks. We differentiate between two types of Palestinian organizations. The main goal of one organization is to establish a sovereign Palestinian state in the West Bank and the Gaza Strip, parts of the territories that Israel occupied in the 1967 Arab-Israeli war. We identify this group with the Palestinian Authority (hereinafter PA). The main goal of the second organization is the establishment of a sovereign Palestinian state in accordance with the borders of British Mandate Palestine, i.e., the occupied territories as well as Israel. We identify this group with Hamas. For the purposes of our model, the difference between these groups is that the PA behaves strategically and engages in costly terrorist activity only insofar

as this may induce Israel to emancipate the occupied territories. Hamas, in contrast, maximizes the expected level of terrorist activity against Israel, irrespective of whether or not emancipation is granted.

At any given period the sequence of events is as follows. First, the PA chooses whether or not to aggressively suppress Palestinian terrorists. In practice, the PA can implement policies that aim to thwart terrorism, such as confiscating illegal weapons, actively pursuing and incarcerating terrorists, and dismantling the terrorist infrastructure. The PA incurs a cost for choosing not to suppress terrorists. After observing the PA's choice, Israeli voters elect a party to hold office. Israelis do not know whether the PA or Hamas is responsible for the terror attacks.[3] Israelis value the occupation but incur a utility cost from terrorism. Only two parties run for office, Left and Right. The only difference between them is that a left-wing government is more likely to grant emancipation. Hence, Israelis vote for the left-wing party only if, at that particular point in time, their utility from granting emancipation is greater than their utility from continuing the occupation. After observing the Israelis' move, the Palestinian organization that perpetrates the terror attacks chooses a level of effort in pursuit of such attacks. The actual level of terrorism is a random variable; its expected value depends on the level of effort exerted and the PA's self-policing choice. At the end of each period, nature makes two moves. First, the realization of a random variable (the distribution of which depends on the elected Israeli government) determines the political state—occupation or emancipation—in the next period. Emancipation is an absorbing state, once granted it cannot be taken away. Second, the level of terrorism is realized. Israelis and Palestinians observe these realizations and

[3] Although Hamas tends to publicly assume responsibility when any of its members commits an attack, Israelis may not know whether the PA was able or unable to stop the attack. For the purposes of this paper, we say that the PA is responsible for an attack if it is able to stop it but unwilling to do so.

update their beliefs according to Bayes rule.

The main theoretical result shows that in the unique pure strategies Markov perfect equilibrium of the game, if Israelis believe that they are most likely facing Hamas, the PA will try to differentiate itself from Hamas by suppressing terrorism and exerting low effort during the last stage of every period. When sufficient differentiation is achieved, if the territories are still occupied the PA will choose not to combat terrorism, thereby raising the expected level of attacks. By encouraging an increase in the level of terrorism, the PA seeks to impose costs on the Israelis in order to force them to grant emancipation. In equilibrium, Israelis always vote for the right-wing party if they believe that the perpetrator of the terror attacks is most likely Hamas. If Israelis believe that the PA is behind the attacks, they will vote for the left-wing party only when the PA accommodates terrorists and will vote for the right-wing party if the PA cracks down on terrorists.

The intuition behind the equilibrium strategies is as follows. When Israelis believe with high probability that Hamas is behind the attacks, they expect a high level of terrorism whether emancipation is granted or not. Therefore, Israelis, who obtain a benefit from occupation, vote for the right-wing party. Within this range of beliefs, the PA cracks down on terrorists and makes little effort to perpetrate terror attacks as it tries to differentiate itself from Hamas. That is, the PA wants to establish a reputation as a rational partner for peace. Once such a reputation is established, if the PA continued to suppress terrorism, Israelis wouldn't suffer a cost from maintaining the occupation and would thereby try to perpetuate it. It is for precisely this reason that the PA accommodates terrorism: to impose costs on the Israelis in order to force them to liberate the territories. Israelis expect the continuation of occupation to lead to a stream of high-level terror attacks, not because they are facing Hamas but because the PA is not suppressing terrorism. Since

the PA's optimal strategy is to suppress terrorism once emancipation is granted, within this range of beliefs Israelis vote for the left-wing party after observing that the PA is accommodating terrorism.

Thus, our analysis emphasizes that terrorism is mainly used to impose costs on the Israelis in order to force them to grant emancipation. Although the current costs may be substantial, it is the expectation of severe terrorism in the future that convinces the Israeli electorate that the occupation is not worth maintaining. This provides a formalization of Pape's (2003) arguments. In addition to these arguments, our model also provides an explanation for periods of relative calm. During such periods, the PA attempts to signal to the Israeli electorate that it is able to lower the level of terrorism. Such a signal is important for the PA because the Israeli electorate will have no incentive to end the occupation if it believes that terror will continue even after emancipation is granted.

The equilibrium of the theoretical model generates two precise empirical predictions about the interaction between terrorism and electoral outcomes. First, we expect relative support for the right-wing party to increase after periods with high levels of terrorism and to decrease after periods of relative calm. Second, perhaps paradoxically, the model predicts that the expected level of terrorism will be higher during the left-wing party's term in office than during that of the right-wing party. Notably, this prediction follows from the Palestinians' strategic considerations and not from different deterrence policies that the Israeli government might implement.[4]

Kydd and Walter (2002) and Bueno de Mesquita (2004) also focus on the Israeli-Palestinian conflict, developing alternative explanations for the observed fluctuations on

[4] In this respect our empirical analysis is significantly different from most empirical studies of terrorism. In general, empirical studies of terrorism assume that terrorists' utilities are increasing in the level of attacks and that the observed fluctuations are due to the implementation of different deterrence policies (Enders and Sandler, 1993 and 2002; Brophy-Baermann and Conybeare, 1994).

the level of terrorism. In the framework of Kydd and Walter (2002), extremists engage in terrorism to thwart the implementation of a peace treaty. Accordingly, we should expect a significant short-term increase in the level of terrorism only during a peace process. Bueno de Mesquita (2004) developed a complementary framework, in which only moderate terrorist organizations accept the concessions granted by the government, leaving extremists in control of the violent opposition. This accounts for an increase in the militancy of organizations that engage in terrorist activity and, insofar as counter terrorism fails, for a longer-term increase in terror attacks.[5]

While we focus on the same case study, we consider our approach as complementary to those outlined above. Following the implications of the theoretical model our empirical estimation concentrates on the striking variability in the level of terrorism only for periods that precede Israeli elections. Accordingly, the PA's optimal level of terrorism before an Israeli election varies depending on the identity of the incumbent political party in Israel. We would expect to observe a higher level of pre-election terrorism when Labor (the left-wing party) holds office than when the Likud (the right-wing party) is in power. Moreover, our paper also studies the effects of terrorism on the political preferences of the Israeli electorate, a topic not directly covered by the two aforementioned analyses.

We test the hypotheses that our theoretical model elicits by using a newly created data set on terrorism in Israel and the occupied territories between 1990 and 2003. The first hypothesis is strongly supported by data culled from public opinion polls on the Israeli electorate's political preferences. Accordingly, a temporary marginal increase in the number of terror fatalities causes a 0.3 percent short-term increase in the support for the right-wing party. A permanent increase in fatalities, in turn, leads to a permanent

[5]For a thorough comparison of the two approaches see Bueno de Mesquita (2003).

increase of 2 percent per fatality in the support for the right-wing party, evaluated at the averages. The results are not affected when we control for the identity of the incumbent party. Furthermore, whether the prime minister is affiliated with the right-wing party at the time of the attacks has no effect on that party's relative support either.

To determine the validity of the second hypothesis we use a combination of event study methods and likelihood ratio tests. The main results support our theoretical prediction for three of the four Israeli governments in the studied time period. Accordingly, there is a statistically significant increase in the level of terrorism during the left-wing party's term in office and a statistically significant decrease in terrorism during the tenure of the right-wing party. Only the unity coalition government leaded by Ariel Sharon between March 2001 and February 2003 witnessed a pattern of terrorism that clashes with our analytical results. Since this government was atypical for several reasons, we are confident that the results obtained strongly support our theoretical predictions.[6]

At a first glance, the picture that emerges from our empirical findings may lend itself to alternative theoretical explanations. A model that focuses on terrorism-deterrence policies, for example, may in principle fit the empirical patterns that we obtained. According to this model, terrorist groups wish to maximize the number of attacks irrespective of the reigning political environment in Israel. There are fewer attacks when the right-wing party holds office simply because this party adopts tougher antiterrorism policies. It would thus be natural to expect the electorate's preferences to shift rightward during periods with severe terrorism.

It is an empirical fact that deterrence policies have an effect on fluctuations in terrorism

[6]The coalition government formed between 2001 and 2003 is difficult to characterize. During this period, although the prime minister belonged to the right-wing party, the left-wing party was not only an active partner in the ruling coalition but also was the party with the largest representation in parliament.

(Enders and Sandler, 1993 and 2002; Brophy-Baermann and Conybeare, 1994). The surprising findings in our case study are, however, that left-wing governments were much more aggressive than right-wing governments in applying deterrence policies during the time period at issue—the same time period when there was a significantly higher number of attacks against left-wing incumbents. Available data on the frequency of closures in the West Bank and Gaza Strip on periods that precede Israeli elections show that the left-wing governments of Peres and Barak imposed a total closure on 44 percent and 78 percent of the days, respectively. The right-wing governments during the period at issue made much less use of closures: 5 percent of the days for Netanyahu's government and 0 percent for Sharon's first government.

The conviction among some Israeli voters that the right-wing party is tougher on terrorism may play a role on their preferences towards the different political parties. Although we do not dispute this, the evidence provided above makes us strongly doubt that the deterrence policy hypothesis can account, by itself, for the observed fluctuations in the level of terrorism. Thus, overall, the evidence obtained leads us to conclude that there is indeed an empirical relationship between terror attacks and electoral outcomes along the lines described in the theoretical model at hand.

## 2. The Theoretical Model

This section develops our theoretical model of territorial occupation, terrorism and emancipation.

### 2.1. Preliminaries

We consider an infinite horizon economy with two types of agents, Israeli citizens and Palestinians residing in the currently occupied territories. Palestinians are affiliated with either the Palestinian Authority (PA) or Hamas. We treat all agents of a given group as identical. Both Palestinian groups share the goal of establishing an independent Palestinian State. The PA demands an Israeli retreat to pre-1967 frontiers. Hamas's main objective is the establishment of an independent Islamic Palestinian state along the borders of British Mandate Palestine.[7]

Time is discrete: $t = 0, 1, 2, ...$ A nature move selects at the outset the group responsible for terrorism.[8] Let $\rho_0 \geq 0$ denote the prior probability at time zero that the PA will be chosen as the perpetrator of the terror attacks. The sequence of events within a period is as follows. At the end of every period a given level of terrorism is realized. Israelis don't know for certain which group is responsible for the terror attacks. Given a history of attacks, at the beginning of period $t$ Israelis assign probability $\rho_t$ to the PA being the group that chooses the effort level exerted in terrorism. The PA then decides whether or not to attempt to suppress terrorists. We denote this decision by $k$; when $k = 0$, the PA cracks down on terrorists; when $k = 1$, the PA accommodates terrorists. Choosing not to suppress terrorists inflicts a cost of $c > 0$ on the PA.[9] After observing the

[7] Article 13 of Hamas's charter, for example, states that "[Peace] initiatives, the so-called peaceful solutions, and international conferences to resolve the Palestinian problem all contradict the beliefs of the Islamic Resistance Movement. Indeed, giving up any part of Palestine is tantamount to giving up part of its religion. The nationalism of the Islamic Resistance Movement is part of its religion, and it instructs its members to [adhere] to that and to raise the banner of Allah over their homeland as they wage their Jihad." (Mishal and Sela, 2000, p. 183).

[8] Assuming, along the lines of Mailath and Samuelson (2001), that there is a small positive probability that the Palestinian group in control of terrorism changes from one period to the next does not affect the results of the model.

[9] This may be understood first as a reputation cost. The reputation cost leads in some cases to economic costs since foreign countries and international organizations are reluctant to extent financial support to a regime associated with terrorist activity. Another interpretation might stress the inherent risk that the PA government faces for not instituting the rule of law. Accordingly, the existence of several

PA's decision as well as the entire history of play up to the current period, Israelis elect a government $g \in \{r, l\}$. The transition probability from occupation to emancipation is assumed to be greater under a left-wing government, $\Pr(em|oc, g = l)$, than under a right-wing government, $\Pr(em|oc, g = r)$. To simplify the notation we denote $\Pr(em|oc, g)$ as $p_g$.

After an Israeli government is elected, the Palestinian organization that perpetrates the terror attacks chooses a level of effort, $e \in \{\underline{e}, \overline{e}\}$, in pursuit of such attacks. The Israeli electorate observes only the realized level of terrorism but does not observe the level of effort chosen. Furthermore, it does not know the identity of the group choosing $e$. If the PA decided to attempt to crack down on terrorist activity, low effort elicits a low level of terrorism, $\tau_l$, with probability $\alpha \in (1/2, 1)$. With probability $1 - \alpha$ low effort results in $\tau_h$. Conversely, high effort yields a low level of attacks with probability $1 - \alpha$, and a high level of attacks with probability $\alpha$. When the PA does not suppress terrorism it affects the outcome distribution of terror attacks. In particular, if the PA chooses to accommodate terrorism, $\Pr(\tau_l|\underline{e}, k = 1) = \gamma \in (1-\alpha, \alpha)$ and $\Pr(\tau_h|\underline{e}, k = 1) = 1-\gamma$.[10] At the end of each period the political state is realized. Emancipation is an absorbing state: once granted it cannot be rescinded and the previously occupied territories will remain a sovereign state in the future.[11] Israelis and Palestinians next observe the realized level of terrorism and update their beliefs about the identity of the group responsible for the attacks. All players discount the future using the same discount factor $\beta \in (0, 1)$.

The Israelis' preferences in each period are represented by a standard von Neumann-

armed factions in PA-controlled territory is a clear source of political instability.

[10] Assuming that not suppressing terrorist activity also raises the expected number of attacks when high effort is exerted would not change any of the results of the paper, as long as the expected level of terrorism when low effort is exerted is always lower than under high effort.

[11] This is not to deny that a territory may be reoccupied. Nevertheless, once emancipation is granted and a new state is established, reoccupation may be extremely costly.

Morgenstern utility function $u^I : \{oc,\ em\} \times \{\tau_l, \tau_h\} \mapsto \mathbf{R}$, where $oc$ is applicable when the territories are under Israeli occupation, $em$ is applicable otherwise, and $\{\tau_l, \tau_h\}$ is the set of feasible terror attacks by the Palestinians, with $\tau_l < \tau_h$. We posit that given a level of terrorism Israelis benefit from continuing the occupation (i.e., $u^I(oc, \tau) > u^I(em, \tau)$ for $\tau = \tau_l, \tau_h$), and that utility is decreasing in the level of attacks (i.e., $u^I(y, \tau_l) > u^I(y, \tau_h)$, $y = oc,\ em$).

The instantaneous preferences of the PA are represented by $w^{PA} : \{oc, em\} \times \{\underline{e}, \overline{e}\} \times \{0, 1\} \mapsto \mathbf{R}$ defined by $w^{PA}(y, e, k) := w(y, e) - kc$, where $e$ reflects the level of effort exerted by the PA, and $k$ is equal to 0 when the PA decides to attempt to suppress terrorism and is equal to 1 otherwise.[12] We assume that for a given level of $e$ and $k$ the PA prefers a state of emancipation over a state of occupation (i.e., $w^{PA}(em, e, k) > w^{PA}(oc, e, k)$), and that effort is costly; that is, for a given political state and decision about whether or not to suppress terrorism the PA would rather exert low effort than high effort (i.e., $w^{PA}(y, \underline{e}, k) > w^{PA}(y, \overline{e}, k)$). Hamas's payoffs are not defined because this group always puts out high effort.

Several clarifications are in order here. In reality, Hamas is a complex organization. Like other social and political movements, it has clearly stated goals and makes strategic decisions in pursuit of them. Even if one of the main goals enunciated in the Hamas charter is the liberation of historic Palestine by holy war against Israel and the establishment of an Islamic state on its soil, the group may adjust its behavior to the existing political realities. What counts for the purposes of this paper, however, is not Hamas's essence as a movement but the Israeli electorate's perception of the group. In this respect, our

[12] To avoid introducing more notation, we restrict $w(y, e)$ to $w(y)$ when nature selects Hamas, and not the PA, to exert effort level in the pursuit of attacks.

assumption reflects the prevailing image of Hamas among the Israeli electorate as an ideologically intransigent and politically rigid movement that is willing to pursue the destruction of Israel at any cost, with no limits or constraints.[13]

The PA, unlike Hamas, has adopted a two-state solution approach to the conflict—Israel within its 1967 frontiers and an independent Palestinian state in the West Bank and the Gaza Strip. The divide between Hamas and the PA in regard to ultimate objectives and means to attain them is the source of their peculiar relationship of coexistence. At times, their interests collide and the PA implicitly grants Hamas operational freedom to perpetrate terrorist activity. On other occasions, the PA takes measures against Hamas and its members after determining that terror attacks may undermine its goals (Kimmerling and Migdal, 2003).

### 2.2. Equilibrium Characterization

This section characterizes the unique pure strategy Markov perfect equilibrium of this game, in which strategies depend only on the current state of the game.

In the presence of uncertainty about the Palestinians' type, the state of the system at period $t$ consists of the Israelis' posterior probability that the PA is responsible for terrorism in conjunction with the political state of the territories. The set of possible states is $S = \{(y,\ \rho) : y \in \{em,\ oc\} \text{ and } \rho \in [0,1]\}$. A Markov strategy for the PA, denoted by $\sigma^{PA} : S \times \{l,\ r\} \mapsto \{0,1\} \times \{\underline{e}, \overline{e}\}$, is a function of state $S$ and the government that the Israelis elect in the current period. This strategy determines whether the PA accommodates or attempts to suppress terrorism and what level of effort exerts on terrorist

[13] Hroub (2000) and Mishal and Sela (2000) have produced a thorough study of Hamas. See Kydd and Walter (2002) for a rational choice study of terrorism in which the radical group adopts a nontrivial strategy.

activities after the elections in Israel. Israelis' Markov strategy, denoted by $\sigma^I : S \times \{0, 1\} \mapsto \{l, r\}$, is a function of the state variable as well as of the PA's self-policing decision. This mapping determines the political party that Israelis choose in the current period. Hamas has a trivial strategy, as it makes no choices.

Given the realized level of terrorism $\tau \in \{\tau_l, \tau_h\}$, and prior beliefs $\rho$, let $\varphi(\rho|k, \tau)$ denote the Israelis' posterior beliefs that the PA is the terror perpetrator, conditional on the PA's strategy. A pure strategy Markov perfect equilibrium is a tuple $\{\widehat{\sigma}^{PA}(S|g), \widehat{\sigma}^I(S|k), \varphi(\rho|\tau, k)\}$, such that $\widehat{\sigma}^{PA}$ and $\widehat{\sigma}^I$ are best-responses to each other for all $S$, and Israelis use Bayes rule to update their posterior probabilities. Formally, denote by $w^{PA}(\widehat{\sigma}^I(S|k), \sigma^{PA}, S)$ the instantaneous utility of the PA as a function of the state $S$ and the players' Markov strategies; define the Israelis' expected instantaneous utility by

$$U^I(\sigma^I, \widehat{\sigma}^{PA}(S|g), S) := \Pr(\tau_l|\sigma^I, \widehat{\sigma}^{PA}(S|g), S)u^I(y, \tau_l) + \Pr(\tau_h|\sigma^I, \widehat{\sigma}^{PA}(S|g), S)u^I(y, \tau_h);$$

and let $p_g(\sigma^I, \sigma^{PA}, S)$ denote the transition probability from state $S$ to state $(em, \rho')$ as a function of the strategies $\sigma^I$ and $\sigma^{PA}$. Thus, the resulting Bellman equations for each player are:

$$\begin{aligned} V^{PA}(S) \;=\; & \max_{\sigma^{PA}} \{ w^{PA}(\widehat{\sigma}^I(S|k), \sigma^{PA}) + \beta [ p_g(\widehat{\sigma}^I(S|k), \sigma^{PA}, S) V^{PA}(em, \rho') \\ & + \left(1 - p_g(\widehat{\sigma}^I(S|k), \sigma^{PA}, S)\right) V^{PA}(oc, \rho') ] \} \end{aligned} \tag{2.1}$$

and

$$V^I(S) = \max_{\sigma^I}\{U^I(\sigma^I, \widehat{\sigma}^{PA}(S|g), S) + \beta[p_g(\sigma^I, \widehat{\sigma}^{PA}(S|g), S)V^I(em, \rho') + \left(1 - p_g(\sigma^I, \widehat{\sigma}^{PA}(S|g), S)\right) V^I(oc, \rho')]\}. \quad (2.2)$$

A pure strategy Markov perfect equilibrium is a strategy combination coupled with posterior beliefs so that $\widehat{\sigma}^{PA}$ solves (2.1), $\widehat{\sigma}^I$ solves (2.2), and the posterior beliefs are updated as follows. If the PA exerts high effort, then $\varphi(\rho|\tau, k) = \rho$. Alternatively, when the PA strategy is such that $\widehat{\sigma}^{PA}(S|g) = (k, \underline{e})$,

$$\varphi(\rho|k, \tau_l) = \begin{cases} \frac{\rho\alpha}{\rho\alpha+(1-\rho)(1-\alpha)} & \text{for } k = 0, \\ \frac{\rho\gamma}{\rho\gamma+(1-\rho)(1-\alpha)} & \text{for } k = 1, \end{cases}$$

and

$$\varphi(\rho|k, \tau_h) = \begin{cases} \frac{\rho(1-\alpha)}{\rho(1-\alpha)+(1-\rho)\alpha} & \text{for } k = 0, \\ \frac{\rho(1-\gamma)}{\rho(1-\gamma)+(1-\rho)\alpha} & \text{for } k = 1. \end{cases}$$

We may characterize the unique pure strategy Markov perfect equilibrium by exploiting several features of the model. First, for any $S$ the PA chooses $e = \underline{e}$. Any other behavior is simply more costly and cannot, in equilibrium, influence the Israelis' posterior beliefs.[14] Hence, the continuation value (the discounted expected net present value) for the PA after emancipation is realized is

$$V^{PA}(em, \rho) = \frac{w^{PA}(em, 0, \underline{e})}{1 - \beta},$$

[14] More precisely, if in any period the PA were to choose high effort, Israelis would not adjust their posterior in response to the level of terrorism observed that period. Thus, the PA would optimally choose to make a low effort, disrupting the equilibrium.

since $w^{PA}(em, 0, \underline{e}) > w^{PA}(em, 1, \underline{e})$. That is, $\widehat{\sigma}^{PA}((em, \rho)|g) = (0, \underline{e})$ for any $\rho$ and $g$.

Given $\widehat{\sigma}^{PA}$, the Israelis' continuation value after emancipation is realized is

$$V^I(em, \rho) = \frac{u^I(em, \tau_l)\left[\rho\alpha + (1-\rho)(1-\alpha)\right] + u^I(em, \tau_h)\left[\rho(1-\alpha) + (1-\rho)\alpha)\right]}{1-\beta},$$

which increases monotonically in $\rho$.

In what follows, we impose the following two restrictions:

$$\gamma < \frac{\left[u^I(em, \tau_l) - u^I(em, \tau_h)\right]\alpha - \left[u^I(oc, \tau_h) - u^I(em, \tau_h)\right]}{u^I(oc, \tau_l) - u^I(oc, \tau_h)}, \tag{2.3}$$

and

$$u^I(em, \tau_l) - u^I(oc, \tau_h) > \left[u^I(oc, \tau_l) - u^I(em, \tau_h)\right]\frac{(1-\alpha)}{\alpha}. \tag{2.4}$$

The first inequality imposes an upper bound on $\gamma$, the parameter that characterizes the expected level of terror attacks when the PA decides not to stop terrorism. This condition ensures that the increase in expected terror attacks when the PA accommodates terrorism is significant enough so that to try to maintain the occupation of the territories is no longer a dominant strategy for the Israelis, irrespective of their beliefs.[15] The second inequality is a technical requirement that guarantees that the range of $\gamma$ is not empty.[16]

In view of these assumptions, in a state of occupation, contrary to the analysis above, the PA's optimal strategy depends on the Israelis' strategy. At equilibrium, it

[15] Note that the PA always suppresses terrorism if this condition is not satisfied. Within a more general framework where the PA can choose the level of self-policing (i.e., where the decision is not dichotomous), condition (2.3) is always satisfied endogenously. Otherwise the PA would not be able to threaten Israelis with cooperation with terrorist organizations, and occupation would be maintained in perpetuity.

[16] This condition is not very restrictive either. If we assume, for example, that $u^I(y, \tau) = f(y) \times (\tau_h - \tau)$, where $f(em)$ is equal to a constant $a > 0$ and $f(oc)$ is equal to a constant $b > a$, the second inequality is satisfied whenever $\frac{a}{b} > \frac{1-\alpha}{\alpha}$; i.e., when the benefits of continuing the occupation for a given level of terror attacks do not significantly exceed the benefits of granting emancipation.

is clear that Israelis elect a left-wing government whenever the continuation value of emancipation is greater than the continuation value of maintaining the occupation; that is, whenever $V^I(em, \rho) > V^I(oc, \rho)$. Otherwise, Israelis elect a right-wing government. Given the Israelis' behavior and beliefs, the PA may find it profitable in certain states to accommodate terrorism in order to lower the value that Israelis accrue from maintaining the occupation. Note in particular that if the PA cracks down on terrorists $V^I(em, \rho) < V^I(oc, \rho)$ for every $\rho$, implying that $\widehat{\sigma}^I((oc, \rho)|k = 0) = r$. For a certain range of $\rho$, however, if the PA does not suppress terrorism as long as the territories are occupied $V^I(em, \rho|k = 0) > V^I(oc, \rho|k = 1)$; that is, the PA accommodates terrorism in order to induce the Israelis to favor emancipation.[17]

For such a strategy to be effective, the PA's threats not only to continue terror as long as the territories are occupied but also to stop terror if emancipation occurs, need a certain level of credibility. This credibility is captured by $\rho$. In other words, for $\rho$ high enough, Israelis believe that they will suffer in the future a relatively high level of terror attacks as long as the occupation continues. Perhaps more importantly, they also believe that these terror attacks will stop as soon as emancipation is granted.

More specifically, there exists a unique $\rho^* \in (0, 1)$ implicitly defined by

$$\begin{aligned} V^I(em, \rho^*) &= U^I(\sigma^I, (1, \underline{e}), (oc, \rho^*)) + \beta[p_g(\sigma^I, (1, \underline{e}), (oc, \rho^*))V^I(em, \rho') \\ &\quad + (1 - p_g(\sigma^I, (1, \underline{e}), (oc, \rho^*))V^I(oc, \rho')] \end{aligned}$$

[17] Several researchers posit that this is indeed the main strategy used by terrorists. This behavior is in accordance to Oots (1986), who argues that terrorists use this strategy as an exchange medium for concessions.

so that for $\sigma^{PA}((oc,\rho)|g) = (1,\underline{e})$,

$$V^I(em,\rho)\begin{cases} < V^I(oc,\rho), & \text{for } \rho < \rho^*, \\ > V^I(oc,\rho), & \text{for } \rho > \rho^*. \end{cases}$$

Since accommodating terrorism is costly, the PA does not indulge in it unless it has an effect on the Israelis' strategy. Since $\widehat{\sigma}^I((oc,\rho)|k) = r$ for $\rho < \rho^*$ irrespective of $k$, then $\widehat{\sigma}^{PA}((oc,\rho)|g) = (0,\underline{e})$ in this range of beliefs. Although accommodating terrorism influences the Israelis to vote for the left-wing party when $\rho > \rho^*$, the PA does not always profit by taking such an action. The PA accommodates terrorism within this range of beliefs when the cost of so doing satisfies the following constraint:

$$c \leq \beta(p_l - p_r)[\frac{w^{PA}(em,0,\underline{e})}{1-\beta} - V^{PA}(oc,\rho)]; \tag{2.5}$$

that is, the PA refrains from suppressing terrorists whenever $c$ is less than the benefits of accommodating terrorists. These benefits are a function of the probability of obtaining emancipation under the different political parties and the increase in the PA's value of emancipation relative to occupation. That is, the higher the value of emancipation relative to occupation, the more likely it is that condition (2.5) is satisfied, thereby giving the PA an incentive to accommodate terrorism.[18]

The proposition below summarizes our characterization of the unique pure strategy Markov perfect equilibrium of the game.

**Proposition 1.** *Suppose that conditions (2.3), (2.4) and (2.5) hold. There exists*

[18] Note that the PA accommodates terrorists even if Hamas is responsible for the terror attacks. Hence the decision about whether to suppress or accommodate terrorism does not reveal the identity of the group responsible for terror attacks.

*a unique pure strategy Markov perfect equilibrium such that, if the territories are under Israeli occupation:*

*1. For $\rho < \rho^*$, the PA suppresses terrorism and never exerts a high effort in the pursuit of terror attacks. Israelis vote the right-wing party into office irrespective of the PA's self-policing decision.*

*2. For $\rho \geq \rho^*$, the PA accommodates terrorism but exerts low effort in the pursuit of terror attacks. Israelis vote the left-wing party into office whenever the PA accommodates terrorism and elect the right-wing party when the PA cracks down on terrorism.*

*If the territories were emancipated in the past, the PA suppresses terrorism and exerts low effort in the pursuit of terrorist activity. Israelis elect either the right-wing or the left-wing party, irrespective of the PA's self-policing decision.*

*In every case beliefs are updated according to Bayes rule.*

Proposition 1 carries two precise empirical implications. First, repeated realizations of a high level of terrorism amplify Israelis' conviction that Hamas is the Palestinian organization behind the attacks. This belief induces the Israeli electorate to shift rightward. That is, the theoretical model predicts that public support for the right-wing party will increase after periods of severe terrorism and will decrease after relatively calm periods. Second, perhaps paradoxically, the model predicts that, as long as the territories remain under Israeli occupation, the expected level of terrorism at equilibrium is higher under a left-wing government than under a right-wing government. The reason is that Israelis elect a right-wing government because they consider it highly probable that Hamas is behind the terror attacks. In view of these beliefs, the optimal strategy for the PA is to try to lower the expected level of terrorism as much as possible, choosing $\widehat{\sigma}^{PA}(S|g) = (0, \underline{e})$. In contrast, when Israelis believe that the PA controls the level of terrorism, the PA ac-

commodates terrorism in order to increase the expected level of terror attacks, thereby decreasing the Israelis' benefits from the occupation. Since the PA's strategy has made the continuation of the occupation less alluring for Israelis, the Israelis elect a left-wing government in order to increase the probability of granting emancipation.

The next section subjects the validity of the two theoretical implications to empirical assessment.

## 3. Empirical Analysis

This section tests the implications of the foregoing theoretical model by using public opinion polls and a newly created data set on terror attacks in Israel and the occupied territories between 1990 and 2003.

### 3.1. Data

Definitions of terrorism vary widely. A given act may be defined as terrorism in one person's opinion and as a fight for freedom in the views of another. The particular definition of terror attacks that we use for the construction of our data set is the one set forth by the US State Department, contained in Title 22 of the United States Code, Section 2656f(d). Accordingly,

– "Terrorism" denotes premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents, usually intended to influence an audience.

– "International terrorism" denotes terrorism involving citizens or the territory of more than one country.

– A "terrorist group" is any group that practices, or that has significant subgroups

that practice, international terrorism.

Specifically, our data set on terrorists' attacks contains daily information on each and every *fatal* terror attack against *noncombatants* that occurred on *Israeli soil* between October 31, 1990 and May 31, 2003.[19] Several explanations about the definition of terror attack that we are using are in order.

a. "Fatal": Due to constraints in the collection procedure, only attacks that claimed the life of someone other than the terrorist were included.

b. "Noncombatants": This term is construed as including, in addition to civilians, military personnel who were unarmed and/or not on duty at the time of the incident.

c. "Israeli Soil": including occupied territories when under Israeli control.

The main sources of the data are the Israeli Foreign Ministry, the National Insurance Institute, the Israeli Defense Forces and the archives of two newspapers (Ma'ariv and Ha'aretz).[20] To the best of our knowledge, this is the most accurate and comprehensive unclassified data set regarding fatal terror attacks against noncombatants on Israeli soil. The data are shown in Figure 1; summary statistics appear in Table 1.

To test the impact of terrorism on the Israeli electorate we gathered data from public opinion polls on Israelis' political preferences. We collected all the polls published by *Ma'ariv*, a leading Israeli newspaper, during the relevant time period. The published polls were first conducted by Gallup Israel, later on by Market Watch, and after November 2002 by a new polling company named New Wave. Table 2 presents summary statistics on these data.

Several potential problems with the data are worth emphasizing. First, the data on

[19] Our data set extends back to 1949. The reason we use data from 1990 onwards is because our theoretical model is suitable only for the period following the beginning of the peace process.

[20] See Berrebi (2003) for a more detailed description of the data set and its sources.

terror attacks indicate only attacks in which someone other than the terrorist died. Thus, foiled attacks and "unsuccessful" attacks in terms of producing fatalities are not included. Terror attacks not on Israeli soil were also excluded. Since these types of attacks may affect the Israeli electorate's views, we may be omitting relevant terrorist events. Second, the data culled from public opinion polls do not appear regularly; there is a high frequency of observations before scheduled elections and lengthy intervals without observations shortly following elections. Additionally, *Ma'ariv* (the newspaper from which we culled the data) used several different polling companies during the period at issue. This may introduce additional noise to the results since different companies may use different methods to gather and analyze the data. Finally, the persistence of individuals' political preferences as reflected in public opinion polls is likely to cause serial correlation problems.

Apart from these problems, we should be particularly attentive to Israel's electoral system. Israel's electoral system is based on nation-wide proportional representation and the number of seats that every list receives in the Knesset (as the parliament is known) is proportional to the number of votes received. The executive branch is not elected directly; instead, the president nominates a prime ministerial candidate who has to obtain the support of a majority of the parliament members in a vote of confirmation.[21] Elections are supposed to take place every four years but the parliament may decide by an ordinary majority to dissolve itself and call for unscheduled early elections.[22] This means that the timing of elections is endogenous to the political environment. In fact, all

[21] Beginning with the elections in 1996 the Israeli parliament introduced a system of direct elections for the premiership in which each voter cast two ballots: one for an individual prime ministerial candidate and one for the parliamentary list of his/her choice. Given the short and turbulent terms of the three prime ministers who were elected under this system, the direct elections concept was discontinued in 2001 and the previous system was reinstated.

[22] When the system with a direct election for the prime minister was in effect, the prime minister, as well as the parliament, could apprise the president of early elections. Now that this system has been abolished, the prime minister may recommend to the president that he/she call for early elections but the parliament may block any such initiative.

Knesset elections during the period at issue preceded their original scheduled dates. In 1992, 1996, 1999 and 2001 the parliament called for early elections, whereas the elections for the Sixteenth Knesset in 2003 were brought forward at the initiative of the prime minister.

The endogeneity of the electoral schedule introduces another complication in our empirical analysis. In the theoretical model, the timing of events within a period is exogenous to the realization of terror attacks. In practice, however, we expect the level of terrorism to be a function not only of the ideology of the current government but also of its perceived stability. Palestinians may raise the level of terrorism to topple a government that they dislike or may impose a period of relative calm to help a government that they favor. Our theoretical model does not account for these types of strategies. To solve the problem we confine the estimation of the effect of the government's ideology on the level of terror attacks to the period between the fall of a government and the scheduled elections for a new one. During this period we may treat the upcoming elections as exogenously given since their date is announced in tandem with the collapse of a government.

Despite these limitations we consider the data are accurate enough to help us to investigate the empirical relationship between terrorism and electoral outcomes.

### 3.2. Empirical Strategy and Results

#### 3.2.1. Impact of Terrorist Attacks on the Israeli Electorate

According to the first hypothesis of our theoretical model, we expect that the relative support for the right-wing party increases during periods with high levels of terrorism and decreases during periods of relative calm.

A simple count of terror fatalities several months before each election during the

relevant period is quite revealing. Figure 2 presents the number of terror fatalities during the five months that immediately preceded each election together with the outcome of the elections. This circumstantial evidence shows that the left-wing party (Labor) won every election when fewer than twelve people died in terror attacks during the relevant months, and that the right-wing party (Likud) won the elections when the number of terror fatalities during the five months that preceded the election was forty-eight or more. This evidence is far from conclusive, of course, since we cannot conduct a meaningful statistical analysis on the basis of only five observations.

To amass additional observations we collected the results of public opinion polls about voters preferences. The results of the polls serve as a proxy of electorate outcomes and help us to overcome the difficulty created by the simultaneous relation between terrorism and electoral outcomes. Panel (a) in Figure 3 displays the basic data. The figure shows the percentage share of the right-wing party in the two party vote, $PSR_t$, and the number of terror fatalities thirty days before the day on which the poll was taken, $\tau_t$.[23] These data indicate some extent of a patterned relationship between the two variables of interest. Most notably, the Israeli electorate's support for the right-wing party increases in times of violence and decreases in times of calm.

To conduct a formal statistical analysis we consider the following flexible dynamic model of fourth order

$$PSR_t = \delta_0 + \delta_1 Pollster + \delta_2 Trend + \delta_3 Right + \sum_{i=1}^{4} \pi_i PSR_{t-i} + \sum_{i=0}^{4} \lambda_i \tau_{t-i} + u_t, \quad (3.1)$$

[23] In panel (b) we average the polls that were conducted within the same month. The purpose is to create a series of evenly spaced observations that we use to overcome the serial correlation problem in the data.

where *Pollster* is a dummy variable that controls for the different polling companies used by *Ma'ariv*; *Trend* is a time trend; *Right* is a dummy variable that equals one when the prime minister belongs to the right-wing party; $PSR_t$ and $\tau_t$ are as defined in the preceding paragraph; and $u_t$ are serially independent shocks. We are mainly interested in the coefficients of lagged $PSRs$ and all $\tau s$' coefficients. The first set of coefficients provides a proxy of Israelis' beliefs in previous periods; the second set allows us to estimate the impact of the level of terrorism on changes on Israelis' current preferences.

We estimate the vector of unknown parameters consistently by least squares. Two observations should be made. First, according to a standard Lagrange Multiplier test the residuals are not serially correlated in this and in all subsequent models that we estimate. Second, according to a Granger causality test the number of terror fatalities thirty days before the polling date is weakly exogenous to the share of political support for the right-wing party.[24]

The results of the estimation of equation (3.1) appear in column (1) of Table 3. Columns (2) to (9) report the estimated coefficients when we sequentially eliminate insignificant parameters. The preferred specification is reported in column (9). According to this specification, a marginal increase in the number of terror fatalities causes an immediate increase of slightly above 0.3 percent in the support for the Likud, when evaluated at the averages. At the long run equilibrium, the relationship between $PSR$ and $\tau$ is described by the following equation:

$$PSR^* = 0.46 + 0.01\tau^*.$$

[24] The results of these tests are available from the authors upon request.

This implies that a permanent increase of one terror fatality increases the long term support for the Likud by 2 percent (evaluated at the averages). This result is not affected by the identity of the incumbent party, or whether or not the prime minister at the time of the attack belongs to the Likud.[25]

In view of some of the aforementioned problems with the collected data (irregularity of the polls, use of several different polling companies during the period at issue), much of the observed variability may be due to noise produced by sampling error and not a reflection of true shifts in public opinion. To accurately separate shifts in public opinion from random movements, we follow closely the framework pioneered by Green et al. (1999), based on the Kalman filter. The only difference between our analysis and that developed by Green et al. (1999) is that we incorporate a covariate (terror fatalities) that may influence the equilibrium public support for the various political parties.

The Kalman filter is actually a set of algorithms that allows us to optimally separate true movements in public opinions from noise, reducing measurement error by accumulating information across surveys and smoothing the time series. Under some regularity assumptions, the Kalman filter delivers smoothed estimates that have the smallest mean squared error of any linear weighting scheme applicable to a sequence of polls (Hamilton, 1994). This methodology also allows us to gauge the state of opinion during periods when polls were not conducted by interpolating missing observations and calculating their standard error. This is especially important in our estimation in view of the available data set, which has a high frequency of observations during election periods and lengthy intervals without observations as the country moves farther away from scheduled elections.

[25] Table 3 does not present the model that includes the interaction variable because the coefficient of this variable is not statistically significant.

Formally, we want to estimate the effect of terrorism on the true support ratio for the right-wing party at any point in time, $TS_t$. Adhering to our theoretical framework, we assume that this support is influenced mainly by the party's prior support and the level of terrorism in the immediate past. The resulting specification is expressed as follows:

$$TS_t = \theta_0 + \theta_1 TS_{t-1} + \theta_2 \tau_t + \varepsilon_t,$$

where $\tau_t$ is the total number of terror fatalities thirty days before the poll and $\varepsilon_t$ is the white noise produced by random fluctuations in public opinion. The constant $\theta_0$ allows for the possibility of the existence of a trend in the relative public support for the parties.

The additional noise introduced by sampling error is reflected in the fact that the support we may observe is not the true political support ratio but only the estimated support as shown in the polls, $PSR_t$, where

$$PSR_t = TS_t + \nu_t,$$

with $\nu_t$ being the noise of the measurement process.

By using the Kalman filter algorithms, we generate two alternative series of public support for the right-wing party on the basis of the observed opinion polls: the first series consists of filtered observations and the second series consists of smoothed observations. To generate filtered estimates we move forward in time, iterating the polls until we arrive at the last one in our data set. In particular, we set the first filtered observation, $F_1$, as equal to the polls' estimated support, $PSR_1$, and adjust succeeding filtered observations according to

$$F_t = W_t PSR_t + (1 - W_t)\left(\theta_0 + \theta_1 F_{t-1} + \theta_2 \tau_t\right),$$

where $W_t$ is an estimator of the mean squared error of the public support ratio at time $t$.[26] For periods in which observations are missing, the filtered value is given by

$$F_t = \theta_0 + \theta_1 F_{t-1} + \theta_2 \tau_t.$$

To obtain smoothed estimates we use the filtered estimate and the uncertainty estimate for each observation and move backward in time, adjusting the smoothed estimate according to the observed difference between the filtered estimate and the observed poll realization. Formally, for the last period $S_T = F_T$; for any other period

$$S_t = F_t + (S_{t+1} - \theta_0 - \theta_1 F_t - \theta_2 \tau_t)\omega_t,$$

where $\omega_t$, like $W_t$, is an estimator of the mean squared error of the public support ratio.[27]

Panels (c) and (d) of Figure 3 depict the filtered and smoothed series, respectively. We again use equation (3.1) as our initial model to assess the impact of terror attacks on the popular support ratio for the right-wing party, now applied to the modified data. Table 4 presents the results using the filtered data; Table 5 presents the results for the smoothed data. As the two tables plainly show, the conclusions adduced from the raw data are sustained. In particular, the effect of fatalities on the popular support ratio is still significantly positive. Although its coefficient is not as large as before, the observed decrease is not significant. Tables 4 and 5 indicate that a marginal increase in terror

[26] The estimator $W_t$ depends on current uncertainty about true support for the right-wing party (partly influenced by $Var(\varepsilon)$) and the random sampling error of the current poll ($Var(\nu_t)$). See Green et al. (1999) for the complete characterization of $W_t$.

[27] Unlike $W_t$, the specification of $\omega_t$ takes account of the uncertainty about the true support for the right-wing party and the random sampling error of the polls for all available observations. The full derivation of $\omega_t$ may be found at Green et al. (1999).

fatalities causes a short term increase of 0.2 to 0.26 percent in the support for the Likud, evaluated at the averages. In the long run, the estimated coefficient of $\tau^*$ is 0.0085 for the filtered series and 0.0083 for the smoothed series. This implies that a permanent marginal increase in $\tau^*$ brings about an increase of approximately 1.65 percent in the long run support for the right-wing party, evaluated at the averages.

### 3.2.2. Impact of the Elected Israeli Government on the Level of Terrorism

A direct implication of our theoretical model is that the level of terrorism and electoral outcomes are determined simultaneously. This introduces the first difficulty in testing the second hypothesis. Our empirical estimation also has to bear in mind that not only the outcomes but also the timing of elections are endogenous to the level of terrorism. Thus, we cannot use an ordinary regression model to test the effect of the elected Israeli government on the level of terrorism. It is for these reasons that we used a combination of event study methods and more conventional likelihood ratio tests to assess the validity of the second hypothesis.

We adapt event study methods to analyze the effect of the elected Israeli government on the level of terrorism. The used method treats a given event that occurs at a predetermined point in time as exogenous and studies the impact of the event on the realizations of a variable of interest to us.[28] In our case, with electoral outcomes as the variable of interest, we are able to measure their impact on the level of terrorism.

As discussed above, the dates of elections in Israel are not always determined exogenously. In fact, only during the period between the fall of a government and scheduled elections for a new one can an upcoming election day be regarded as exogenous, known

[28] See Campbell et al. (1997) for a general description of event study methods and Abadie and Gardeazabal (2003) for an application of such a method to study the impact of terrorism on stock returns in Spain.

both by the Israeli electorate and terrorists. Therefore, these are the periods that we use for our analysis.[29]

Another advantage of the statistical method used is that it allows us to perform pairwise comparisons of contiguous governments, thereby distinguishing among governments headed by the same political party in different periods of time. Since immediate history plays a significant role both in our theoretical model and in Israeli politics, it would be a mistake to attribute the same effect to left-wing governments in different periods and to different right-wing governments.

To conduct an event study analysis, we define the day on which the forthcoming election day is announced as the day of the event. Thus, $t = 0$ is the event day. Our sample contains four events. For each, we choose two different periods as estimation windows, $[T_0, T_1]$. We define the year preceding October 31, 1991, as the first period, and compute the average number of terror fatalities during that year. We believe this statistic is a good proxy for $\tau_0$. The second period defined for the estimation windows is the event window of the preceding government, which provides a proxy for $\tau_{t-1}$. According to the theoretical model, the relevant statistic is a convex combination of the two.[30] If the analysis yields similar results for both estimation windows we conclude that the event is significant in the given direction. The end of the event window, $T_2$, is the day on which a new government is inaugurated.

For each event we compute the average number of weekly terror fatalities during the estimation window, $\overline{\tau}$. For each week between 0 and $T_2$ we calculate the abnormal number

[29] We obtain similar results when we ignore the fact that the dates of elections are endogenous and prolong the analysis to the full tenure of each government.

[30] In principle all necessary information should be included in $\tau_{t-1}$. Using only the preceding level of terrorism, however, raises identification issues in the empirical estimation. We overcome those identifications problems with the help of an exogenous period that is unaffected by the dynamics of the model.

of deaths from terrorism, $AD_t$, defined as the observed number of deaths minus $\overline{\tau}$; that is,

$$AD_t = \tau_t - \overline{\tau}, \quad 0 < t \leq T_2.$$

We interpret the abnormal number of deaths from attacks during the event window as a measure of the impact of the ideology of a given government on terrorist activity. We aggregate the abnormal deaths into the cumulative abnormal deaths, $CAD_T$, in order to draw overall inferences. Formally,

$$CAD_T = \sum_{t=0}^{T} AD_t.$$

If $CAD_T$ oscillates around zero, then the studied event has no effect on the level of terrorism. If $CAD_T$ is significantly different from zero, we must conclude that the event had an impact on the level of terrorism. In particular, if the theoretical predictions are correct, then $CAD_T$ should be positive and increasing for a left-wing government that succeeds a right-wing government and negative and decreasing for a right-wing government that succeeds a left-wing government. When compared to $\tau_0$, $CAD_T$ should be positive for a left-wing government and negative for a right-wing government.

Figures 4 and 5 plot the cumulative abnormal deaths for every government during the period at issue compared with $\tau_0$ and $\tau_{t-1}$. The $CAD_T s$ obtained are largely consistent with the theoretical analysis. The evidence supports the hypothesis that the level of terrorism increases during the tenure of a left-wing government when compared both to $\tau_0$ and to the $\tau_{t-1}$ that corresponds to the preceding right-wing government. The opposite results are obtained, for the most part, for right-wing governments. These trends are especially evident in regard to the governments of Peres, Nethanyahu, and Barak. The

$CAD_T$ corresponding to the unity coalition government led by Sharon in 2001-2003 shows a pattern contrary to the one expected for a right-wing government. We treat this finding cautiously, however, since this government is atypical for reasons listed in the introduction.

The standard statistical test applied in event studies assumes that $CAD_T$ is normally distributed. This is clearly not the case in our study, since terror fatalities are count data best described by a Poisson distribution. Therefore, we perform the more conventional likelihood ratio test assuming that deaths from terror attacks do follow a Poisson distribution. For the purposes of this test we perform pairwise comparisons of realizations of $\tau$ between 0 and $T_2$ for contiguous governments, and a comparison of each government with the realization of $\tau$ between October 31, 1990 and October 30, 1991. Our null hypothesis is that the two compared samples are drawn from a Poisson distribution that has the same $\lambda$. The results appear in Table 6.

These results support the conclusions adduced from the event study analysis. In particular, the likelihood ratio test shows that the level of terrorism is significantly higher when a left-wing party is in office than the level before the beginning of the peace process and the level of the preceding right-wing government. The opposite conclusion is reached in regard to the right-wing government of Benjamin Netanyahu. All these results correspond to those suggested by the theoretical model. Again, the level of terrorism was higher during the tenure of Sharon's unity coalition government than both the exogenous level and the level observed during the term of the left-wing government that preceded it.

## 4. A Discussion of Alternative Hypotheses

As noted above, the observed fluctuations in the level of terrorism are also consistent with an alternative model that focuses on terrorism-deterrence policies. We are some-

what skeptical about embedding the terrorism-deterrence argument within a framework of electoral cycles, however, due to the implications of such a model on the behavior of Israel's political parties. In particular, this alternative approach would indicate that political parties do not value holding office. According to our findings, support for the right-wing party increases in periods of high levels of terrorism even if this party is in office during these periods. It follows that the left-wing party has a greater incentive than the right-wing party to lower the number of terror fatalities. This effect should certainly induce the left-wing party to employ deterrence policies that would minimize the expected number of victims.[31] Not surprisingly, the available data show that this is indeed the case.

Table 7 shows the average number of days during the period between the fall of a government and the scheduled elections for a new one when a total or partial closure was imposed on the West Bank and the Gaza Strip. The evidence in the table seems to contradict some of the premises of the deterrence policy hypothesis. Namely, the left-wing party was much more aggressive than the right wing party about imposing closures on the occupied territories during the periods at issue in the analysis.[32]

If we accept the view (partly substantiated by Table 7) that the left-wing party adopts tougher deterrence policies, then the increase in terrorism may be explained only by focusing on the Palestinians' strategy. In other words, only an increase in the number of attacks against Israelis under left-wing governments relative to attacks during right-wing governments may explain the documented fluctuations in the level of terrorism. What

[31] There is no reason to believe that one party is more efficient in terrorism deterrence than the other. The capabilities of the Israeli Defense Forces are not affected by the identity of the ruling party and the feasible policy options remain the same irrespective of the ruling party's ideology.

[32] We view closures as a proxy for the government's deterrence policy. In reality a government may invoke alternative deterrence measures (such as curfews and administrative detention of civilians) to thwart terror attacks. Unfortunately, we were unable to obtain information on the use of these alternative measures.

prompts the Palestinians to perpetrate more attacks when left-wing governments are in office? The deterrence policy hypothesis has nothing to say about this. Our study, on the other hand, presents a new rationale that is consistent with both the documented preferences of Israeli citizens and the observed fluctuations in the level of terrorism.

## 5. Conclusion

This paper studied the interaction between terrorism and electoral outcomes, focusing on the Israeli-Palestinian conflict. The equilibrium of our theoretical model predicted that the support for Israel's right-wing party increases after periods of severe terrorism, and that the expected level of terrorism is higher when a left-wing party is in power. We tested these predictions by combining data on Israelis' political preferences with a newly created data set on terror attacks in Israel. The findings of the empirical analysis support the theoretical predictions. Namely, a marginal increase in the number of terror fatalities leads to a significant increase in the relative support for the right-wing party. Moreover, event study analyses and likelihood ratio tests show that, generally speaking, terrorism escalates when the left-wing party is in office and decreases when the right-wing party takes over.

A justification is in order with regard to the chosen modeling strategy. The model presents the conflict asymmetrically. Accordingly, Palestinians commit terror attacks and Israelis elect governments. A more accurate reflection of the conflict would note that Israeli violence against Palestinians also influences the Palestinians' political preferences, and therefore, their chosen retaliatory strategy. Although such a model seems plausible theoretically, several difficulties preclude us from being able to estimate its predictions. The most important, perhaps, is the absence of a political system in the Palestinian-

controlled territories that would allow for the democratic election of a political party other than Fatah (the faction led by Yasser Arafat) to the leadership of the PA. This implies that changes in the observed Israeli strategy cannot be explained as reactions to Palestinians' electoral outcomes. Be this as it may, the empirical results in Goldstein et al. (2001) show that whereas Israel responded to Palestinian cooperation and conflict during the 1990s by reciprocating, Palestinians did not do the same in regard to Israel's actions. This finding casts serious doubts on the empirical validity of this alternative approach.

In sum, we believe that our approach captures the salient characteristics of the Israeli-Palestinian conflict. The theoretical model develops a structure for thinking about the causes and consequences of terrorism. It also elicits precise empirical predictions that are supported by the available data. We do not dispute the claim that alternative approaches may account for some of the observed empirical patterns. In fact, we regard our thesis as complementary, and not alternative, to existing views on the interaction between terrorism and electoral outcomes.

Although much additional work remains to be done if we are to understand the relationship between terrorism and electoral outcomes, we believe that our approach may be applied, with minor changes, to the study of similar conflicts elsewhere. The conflicts in the Basque country, Northern Ireland, and British Mandate Palestine, to name only a few, resemble our case study in several ways, allowing for the immediate application of the theoretical framework developed here. In all these conflicts, one group resorts to terrorism for the purpose of attaining political emancipation from an occupying force; the group vying for emancipation is divided into two subgroups, moderates and extremists, that have different political objectives; and these groups use terrorism, at least in part, to influence the occupying power's electorate. Obviously, each case has some particularities

that must be kept in mind to facilitate rigorous analysis. It is our hope that further research on these and other conflicts will lead us to a broader understanding of the dynamic interaction between terrorism and its political environment.

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**Table 1** **Summary Statistics**

| | Deaths from terrorist attacks since 1949 | Deaths from terrorist attacks since October 31, 1991*** | Number of fatal terrorist attacks since 1949 | Number of fatal terrorist attacks since October 31, 1991*** | Deaths from suicide attacks since 1949 | Deaths from suicide attacks since October 31, 1991*** | Number of fatal suicide attacks since 1949 | Number of fatal suicide attacks since October 31, 1991*** |
|---|---|---|---|---|---|---|---|---|
| Daily Average | 0.0955 | 0.2283 | 0.0450 | 0.0872 | 0.0276 | 0.1252 | 0.0041 | 0.0182 |
| Daily STD | 0.8403 | 1.4400 | 0.2264 | 0.3228 | 0.6275 | 1.3377 | 0.0697 | 0.1471 |
| Daily Max | 33 | 29 | 3 | 3 | 29 | 29 | 3 | 3 |
| Daily Min | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Weekly** Average | 0.6683 | 1.5967 | 0.3151 | 0.6099 | 0.1930 | 0.8760 | 0.0285 | 0.1273 |
| Weekly** STD | 2.4846 | 4.3729 | 0.7109 | 1.0547 | 1.7797 | 3.7363 | 0.2062 | 0.4252 |
| Weekly** Max | 41 | 41 | 8 | 8 | 32 | 32 | 3 | 3 |
| Weekly** Min | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Monthly Average | 2.9066 | 6.9496 | 1.3706 | 2.6547 | 0.8392 | 3.8130 | 0.1240 | 0.5540 |
| Monthly STD | 7.2485 | 12.8826 | 2.0877 | 3.2565 | 5.0076 | 9.8434 | 0.5851 | 1.1110 |
| Monthly Max | 112 | 112 | 23 | 23 | 79 | 79 | 8 | 8 |
| Monthly Min | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Yearly* Average | 35 | 76 | 16 | 30 | 10 | 41 | 1 | 6 |
| Yearly* STD | 52.8152 | 94.5855 | 17.0059 | 27.1862 | 33.5813 | 60.7440 | 4.8833 | 8.7698 |
| Yearly* Median | 25 | 51 | 11 | 20 | 0 | 24 | 0 | 3 |
| Yearly* Mode | 3 | #N/A | 3 | 17 | 0 | 0 | 0 | 0 |
| Yearly* Max | 351 | 351 | 89 | 89 | 218 | 218 | 32 | 32 |
| Yearly* Min | 0 | 6 | 0 | 4 | 0 | 0 | 0 | 0 |
| TOTAL | 1898 | 966 | 895 | 369 | 548 | 530 | 81 | 77 |

* the year 2003 goes only until May30

** weeks start on Sunday and end on Saturday

*** yearly data include the entire year 1991

**Table 2**

**Summary Statistics From Polls (Between Feb 14, 1992 to Jan 26, 2003)**

| | About the number of days between polls | percent support for left-wing candidate* | percent support for right-wing candidate* | Knesset seats for left-wing party (according to poll)** | Knesset seats for right-wing party (according to poll)** | PSR |
|---|---|---|---|---|---|---|
| Average | 21.973 | 39.16% | 40.47% | 39.417 | 63 | 0.5180066 |
| STD | 51.519 | 0.097 | 0.077 | 2.503 | 2 | 0.1049116 |
| Median | 9 | 41.00% | 40.00% | 40.5 | 63 | 0.4883721 |
| Mode | 7 | 43.00% | 41.00% | 41 | 63 | 0.5 |
| Max | 595 | 60.00% | 63.00% | 42 | 65 | 0.84 |
| Min | 2 | 11.00% | 25.00% | 36 | 58 | 0.308642 |

* Relevant only between Feb 14, 1992 and October 4, 2002 (since November 2002 percentages are no longer presented in terms of candidate support but in terms of number Knesset of seats for party)

** Relevant only between November 15, 2002 and January 26, 2003 (since November 2002 percentages are no longer presented in terms of candidate support but in terms of number Knesset of seats for party)

Table 3: Estimates for the Political Support Ratio between Likud (right) and Labor (left) Parties ($PSR_t$)†

Political Support Ratio (Monthly Averages)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| $\delta_0$ | -0.1532 | -0.1626 | -0.1658 | -0.1118 | -0.1179 | -0.1152 | -0.1117 | 0.0249 | 0.0682 |
| | (0.1934) | (0.1467) | (0.1440) | (0.1085) | (0.1082) | (0.1077) | (0.1072) | (0.0387) | (0.0310) |
| $\delta_1$ | -0.0360 | -0.0382 | -0.0361 | -0.0416 | -0.0363 | -0.0453 | -0.0610 | -0.0588 | |
| | (0.0637) | (0.0559) | (0.0543) | (0.0403) | (0.0399) | (0.0380) | (0.0325) | (0.0328) | |
| $\delta_2$ | 0.0004 | 0.0004 | 0.0004 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | | |
| | (0.0005) | (0.0003) | (0.0003) | (0.0002) | (0.0002) | (0.0002) | (0.0002) | | |
| $\delta_3$ | -0.0019 | | | | | | | | |
| | (0.0255) | | | | | | | | |
| $\pi_1$ | 0.9114 | 0.9150 | 0.9043 | 0.8820 | 0.8555 | 0.8157 | 0.8170 | 0.8647 | 0.7549 |
| | (0.1834) | (0.1745) | (0.1645) | (0.1542) | (0.1515) | (0.1419) | (0.1413) | (0.1382) | (0.1267) |
| $\pi_2$ | 0.2439 | 0.2412 | 0.2541 | 0.3066 | 0.3332 | 0.3450 | 0.3098 | 0.2992 | 0.3132 |
| | (0.2107) | (0.2049) | (0.1927) | (0.1459) | (0.1430) | (0.1416) | (0.1342) | (0.1352) | (0.1381) |
| $\pi_3$ | 0.0577 | 0.0492 | 0.0518 | | | | | | |
| | (0.2159) | (0.1811) | (0.1783) | | | | | | |
| $\pi_4$ | -0.2823 | -0.2859 | -0.2834 | -0.2407 | -0.2392 | -0.2353 | -0.2237 | -0.2231 | -0.2162 |
| | (0.1420) | (0.1317) | (0.1295) | (0.0999) | (0.0998) | (0.0992) | (0.0978) | (0.0987) | (0.1009) |
| $\lambda_0$ | 0.0020 | 0.0020 | 0.0021 | 0.0021 | 0.0020 | 0.0018 | 0.0019 | 0.0019 | 0.0015 |
| | (0.0007) | (0.0006) | (0.0006) | (0.0006) | (0.0006) | (0.0005) | (0.0005) | (0.0005) | (0.0005) |
| $\lambda_1$ | -0.0008 | -0.0008 | -0.0008 | -0.0006 | -0.0004 | | | | |
| | (0.0008) | (0.0008) | (0.0007) | (0.0006) | (0.0005) | | | | |
| $\lambda_2$ | 0.0009 | 0.0009 | 0.0008 | 0.0006 | | | | | |
| | (0.0009) | (0.0008) | (0.0007) | (0.0006) | | | | | |
| $\lambda_3$ | -0.0019 | -0.0019 | -0.0019 | -0.0015 | -0.0010 | -0.0007 | | | |
| | (0.0013) | (0.0013) | (0.0012) | (0.0011) | (0.0010) | (0.0009) | | | |
| $\lambda_4$ | 0.0003 | 0.0003 | | | | | | | |
| | (0.0013) | (0.0013) | | | | | | | |
| Obs. | 49 | 49 | 49 | 53 | 53 | 53 | 53 | 53 | 53 |
| Adj-$R^2$ | 0.8500 | 0.8541 | 0.8874 | 0.8748 | 0.8751 | 0.8762 | 0.8771 | 0.8749 | 0.8691 |

† PSR is the ratio of the support for the Likud (right) party/candidate over the sum of support for the Likud (right) and Labor (left) parties/candidates from the respective poll.
Standard Errors are in parentheses.

Table 4: Estimates for the Political Support Ratio between Likud (right) and Labor (left) Parties ($PSR_t$) – Filtered Series†

Political Support Ratio (Monthly Averages)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| $\delta_0$ | 0.0332 | 0.0302 | 0.0322 | 0.0282 | 0.3816 | 0.0650 | 0.0664 | 0.0785 | 0.0687 |
| | (0.0504) | (0.0490) | (0.0486) | (0.0473) | (0.0423) | (0.0205) | (0.0205) | (0.0192) | (0.0178) |
| $\delta_1$ | 0.0247 | 0.0263 | 0.0251 | 0.0269 | 0.0270 | 0.0286 | 0.0250 | 0.0190 | |
| | (0.0177) | (0.0166) | (0.0162) | (0.0155) | (0.0155) | (0.0153) | (0.0149) | (0.0146) | |
| $\delta_2$ | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | | | | |
| | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0001) | | | | |
| $\delta_3$ | -0.0030 | -0.0033 | -0.0033 | -0.0036 | | | | | |
| | (0.0077) | (0.0076) | (0.0076) | (0.0075) | | | | | |
| $\pi_1$ | 0.7272 | 0.7276 | 0.7313 | 0.7416 | 0.7427 | 0.7486 | 0.7679 | 0.7679 | 0.7870 |
| | (0.0907) | (0.0903) | (0.0895) | (0.0851) | (0.0848) | (0.0843) | (0.0825) | (0.0831) | (0.0821) |
| $\pi_2$ | 0.2257 | 0.2340 | 0.2337 | 0.2240 | 0.2199 | 0.2212 | 0.2550 | 0.2155 | 0.1970 |
| | (0.1174) | (0.1130) | (0.1126) | (0.1094) | (0.1087) | (0.1084) | (0.1042) | (0.1021) | (0.1014) |
| $\pi_3$ | 0.1275 | 0.1189 | 0.1152 | 0.1244 | 0.1201 | 0.1232 | | | |
| | (0.1203) | (0.1157) | (0.1148) | (0.1120) | (0.1112) | (0.1109) | | | |
| $\pi_4$ | -0.2290 | -0.2233 | -0.2278 | -0.2295 | -0.2298 | -0.2306 | -0.1642 | -0.1542 | -0.1340 |
| | (0.0955) | (0.0928) | (0.0917) | (0.0913) | (0.0910) | (0.0908) | (0.0684) | (0.0686) | (0.0670) |
| $\lambda_0$ | 0.0012 | 0.0012 | 0.0011 | 0.0012 | 0.0012 | 0.0012 | 0.0012 | 0.0012 | 0.0013 |
| | (0.0004) | (0.0004) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) |
| $\lambda_1$ | 0.0001 | 0.0002 | 0.0001 | | | | | | |
| | (0.0004) | (0.0004) | (0.0004) | | | | | | |
| $\lambda_2$ | 0.0001 | | | | | | | | |
| | (0.0004) | | | | | | | | |
| $\lambda_3$ | -0.0007 | -0.0006 | -0.0007 | -0.0007 | -0.0007 | -0.0007 | -0.0005 | | |
| | (0.0004) | (0.0004) | (0.0004) | (0.0004) | (0.0004) | (0.0004) | (0.0003) | | |
| $\lambda_4$ | -0.0001 | -0.0001 | | | | | | | |
| | (0.0004) | (0.0004) | | | | | | | |
| Obs. | 128 | 128 | 128 | 128 | 128 | 128 | 128 | 128 | 128 |
| Adj-$R^2$ | 0.9034 | 0.9042 | 0.9049 | 0.9056 | 0.9062 | 0.9066 | 0.9064 | 0.9051 | 0.9045 |

† PSR is the ratio of the support for the Likud (right) party/candidate over the sum of support for the Likud (right) and Labor (left) parties/candidates from the respective poll.
Standard Errors are in parentheses.

Table 5: Estimates for the Political Support Ratio between Likud (right) and Labor (left) Parties ($PSR_t$) – Smoothed Series†

| | Political Support Ratio (Monthly Averages) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| $\delta_0$ | 0.0149 | 0.0161 | 0.0166 | 0.0152 | 0.0118 | 0.0230 | 0.0489 | 0.0492 | 0.0435 | 0.0540 |
| | (0.0412) | (0.0407) | (0.0405) | (0.0398) | (0.0387) | (0.0349) | (0.0164) | (0.0165) | (0.0159) | (0.0144) |
| $\delta_1$ | 0.0180 | 0.0170 | 0.0168 | 0.0174 | 0.0194 | 0.0195 | 0.0211 | 0.0156 | | |
| | (0.0149) | (0.0142) | (0.0141) | (0.0137) | (0.0128) | (0.0127) | (0.0126) | (0.0121) | | |
| $\delta_2$ | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | | | | |
| | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0001) | | | | |
| $\delta_3$ | -0.0038 | -0.0038 | -0.0037 | -0.0038 | -0.0041 | | | | | |
| | (0.0064) | (0.0064) | (0.0063) | (0.0063) | (0.0062) | | | | | |
| $\pi_1$ | 0.9361 | 0.9390 | 0.9546 | 0.9559 | 0.9624 | 0.9622 | 0.9684 | 1.0205 | 1.0239 | 1.0075 |
| | (0.0904) | (0.0891) | (0.0635) | (0.0629) | (0.0606) | (0.0605) | (0.0599) | (0.0493) | (0.0494) | (0.0484) |
| $\pi_2$ | 0.0336 | 0.0313 | | | | | | | | |
| | (0.1262) | (0.1253) | | | | | | | | |
| $\pi_3$ | 0.1626 | 0.1607 | 0.1754 | 0.1785 | 0.1735 | 0.1659 | 0.1698 | | | |
| | (0.1311) | (0.1303) | (0.1157) | (0.1143) | (0.1132) | (0.1124) | (0.1122) | | | |
| $\pi_4$ | -0.2423 | -0.2438 | -0.2433 | -0.2449 | -0.2397 | -0.2399 | -0.2407 | -0.1246 | -0.1162 | -0.1249 |
| | (0.0940) | (0.0934) | (0.0930) | (0.0923) | (0.0911) | (0.0908) | (0.0907) | (0.0487) | (0.0484) | (0.0483) |
| $\lambda_0$ | 0.0009 | 0.0009 | 0.0009 | 0.0009 | 0.0009 | 0.0009 | 0.0010 | 0.0010 | 0.0010 | 0.0010 |
| | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) |
| $\lambda_1$ | 0.0001 | 0.0001 | 0.0001 | | | | | | | |
| | (0.0003) | (0.0003) | (0.0003) | | | | | | | |
| $\lambda_2$ | 0.0001 | 0.0001 | 0.0001 | 0.0001 | | | | | | |
| | (0.0003) | (0.0003) | (0.0003) | (0.0003) | | | | | | |
| $\lambda_3$ | -0.0006 | -0.0006 | -0.0006 | -0.0006 | -0.0006 | -0.0006 | -0.0006 | -0.0005 | -0.0004 | |
| | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0003) | |
| $\lambda_4$ | -0.0001 | | | | | | | | | |
| | (0.0003) | | | | | | | | | |
| Obs. | 128 | 128 | 128 | 128 | 128 | 128 | 128 | 128 | 128 | 128 |
| Adj-$R^2$ | 0.9358 | 0.9364 | 0.9369 | 0.9374 | 0.9378 | 0.9381 | 0.9383 | 0.9376 | 0.9373 | 0.9366 |

† PSR is the ratio of the support for the Likud (right) party/candidate over the sum of support for the Likud (right) and Labor (left) parties/candidates from the respective poll.
Standard Errors are in parentheses.

Table 6: Likelihood Ratio Tests†

| Primer Minister | Event Window | MLE | Joint MLE | | | |
|---|---|---|---|---|---|---|
| | | | With pre-MPC* | | With Predecessor | |
| | | | MLE | LR | MLE | LR |
| Shimon Peres | Feb12, 1996 - Jun19, 1996 | 3.5556 | 1.4347 | 28.03 | 1.7954‡ | 23.19 |
| Benjamin Nethanyahu | Dec21, 1998 - Jul7, 1999 | 0.1071 | 0.4810 | 6.89 | 1.4565 | 42.81 |
| Ehud Barak | Dec10, 2000 – Mar8, 2001 | 2.0833 | 0.9523 | 7.04 | 0.7 | 18.79 |
| Ariel Sharon | Nov5, 2002 – Feb28, 2003 | 4.4706 | 1.6323 | 40.17 | 3.4827 | 5.32 |

† All tests have one degree of freedom
* pre-MPC stands for the year that preceded the beginning of the peace process at the Madrid Peace Conference. The pre-MPC maximum likelihood estimator is 0.6863.
‡ The government leaded by Prime Minister Yitzhak Shamir preceded the one leaded by Peres. Shamir government's MLE is 0.5769.

Table 7: Total and Partial Closures Imposed on the West Bank and Gaza Strip†

| Primer Minister | Event Window | Number of Days | Days of Closure | | | |
|---|---|---|---|---|---|---|
| | | | West Bank | Gaza Strip | Partial Closure§ | Total Closureϒ |
| Shimon Peres | Feb12, 1996 - Jun19, 1996 | 130 | 80 | 85 | 28 | 57 |
| Benjamin Nethanyahu | Dec21, 1998 - Jul7, 1999 | 199 | 9 | 9 | 0 | 9 |
| Ehud Barak | Dec10, 2000 – Mar8, 2001 | 89 | 49 | 85 | 16 | 69 |
| Ariel Sharon | Nov5, 2002 – Feb28, 2003 | 116 | 0 | 0 | 0 | 0 |

† The data for the governments of Shimon Peres and Benjamin Nethanyahu were obtained from B'tselem (www.btselem.org). The data for the governments of Ehud Barak and Ariel Sharon were obtained from the Palestinian Centre for Human Rights (www.pchrgaza.org).

§ Partial Closure: a siege, enforced through road blocks, prevents entry and exit from areas, towns and villages (www.btselem.org).

ϒ Total Closure: prohibits the entry of Palestinians into Israel for any purpose; the safe passage between the West Bank and the Gaza Strip is closed; the international border crossings are closed as well (www.btselem.org).

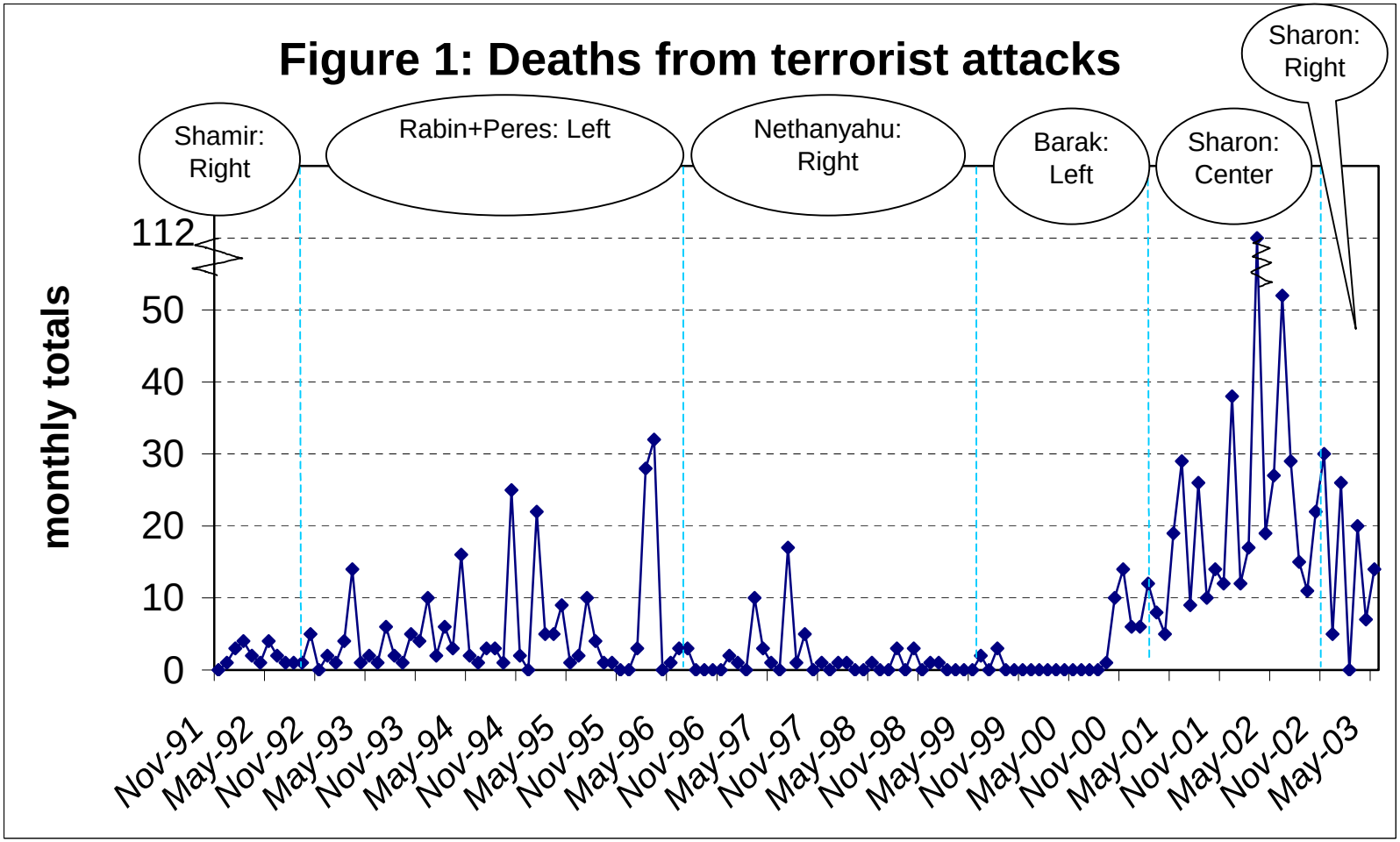


Figure 1: Deaths from terrorist attacks
Shamir: Right
Rabin+Peres: Left
Nethanyahu: Right
Barak: Left
Sharon: Center
Sharon: Right
monthly totals
112
50
40
30
20
10
0
Nov-91
May-92
Nov-92
May-93
Nov-93
May-94
Nov-94
May-95
Nov-95
May-96
Nov-96
May-97
Nov-97
May-98
Nov-98
May-99
Nov-99
May-00
Nov-00
May-01
Nov-01
May-02
Nov-02
May-03

**Figure 2: Deaths from terrorist attacks in the last 150 days prior to elections**

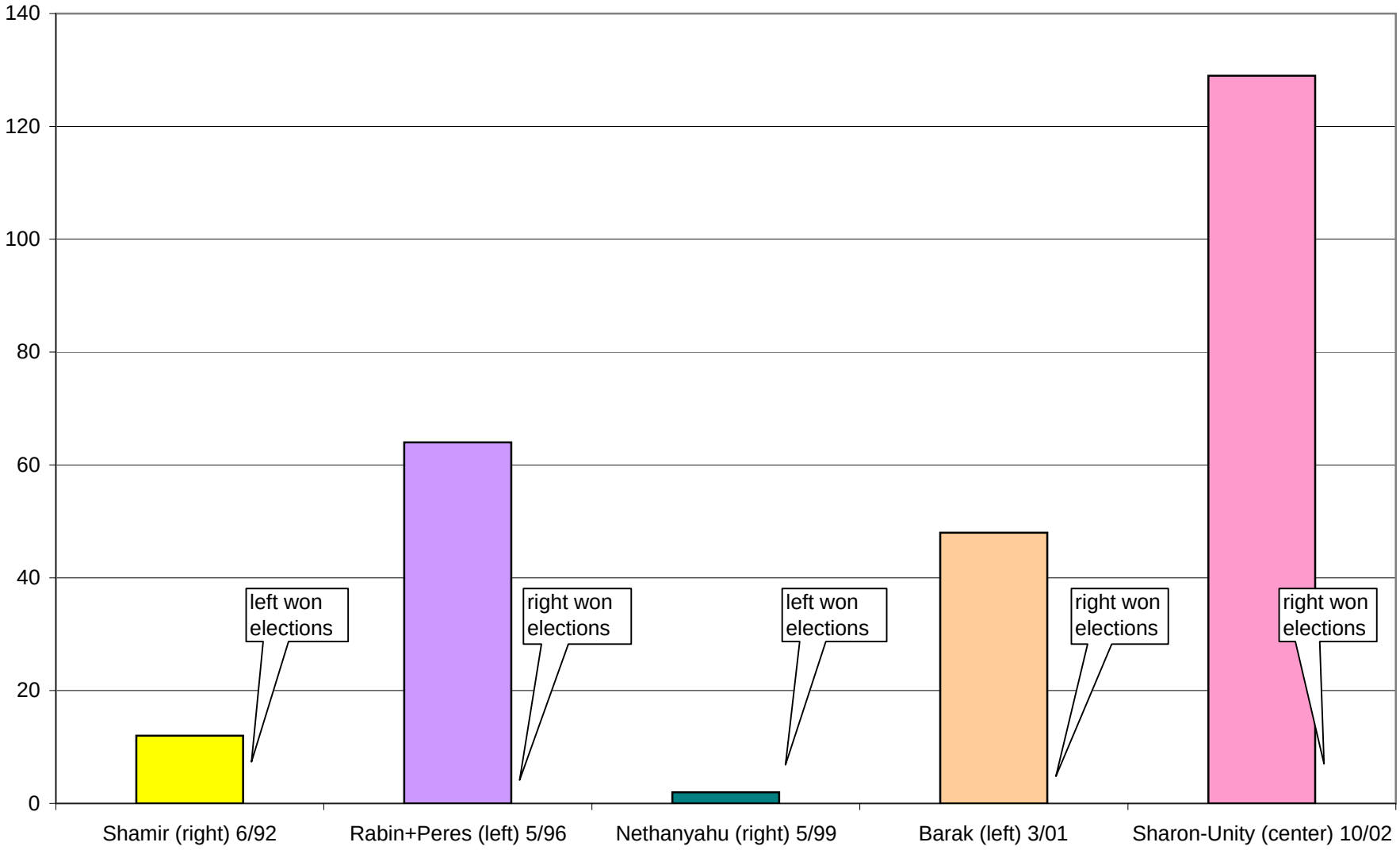
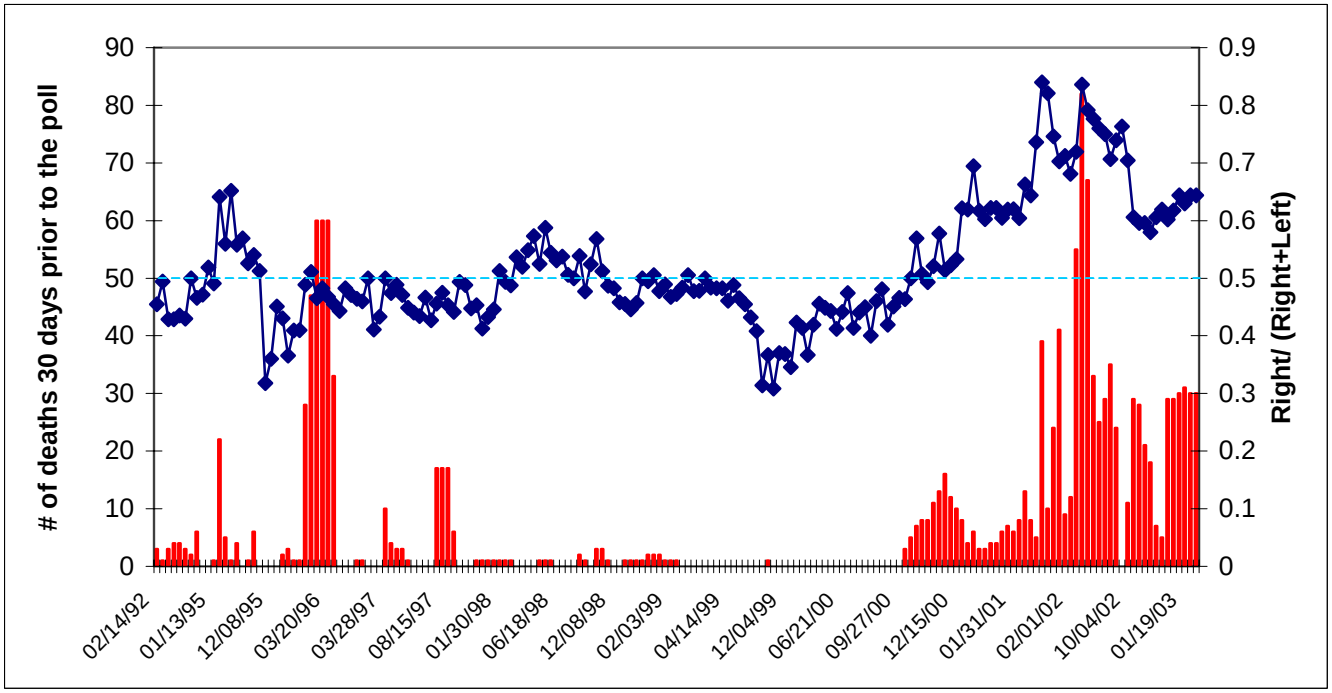
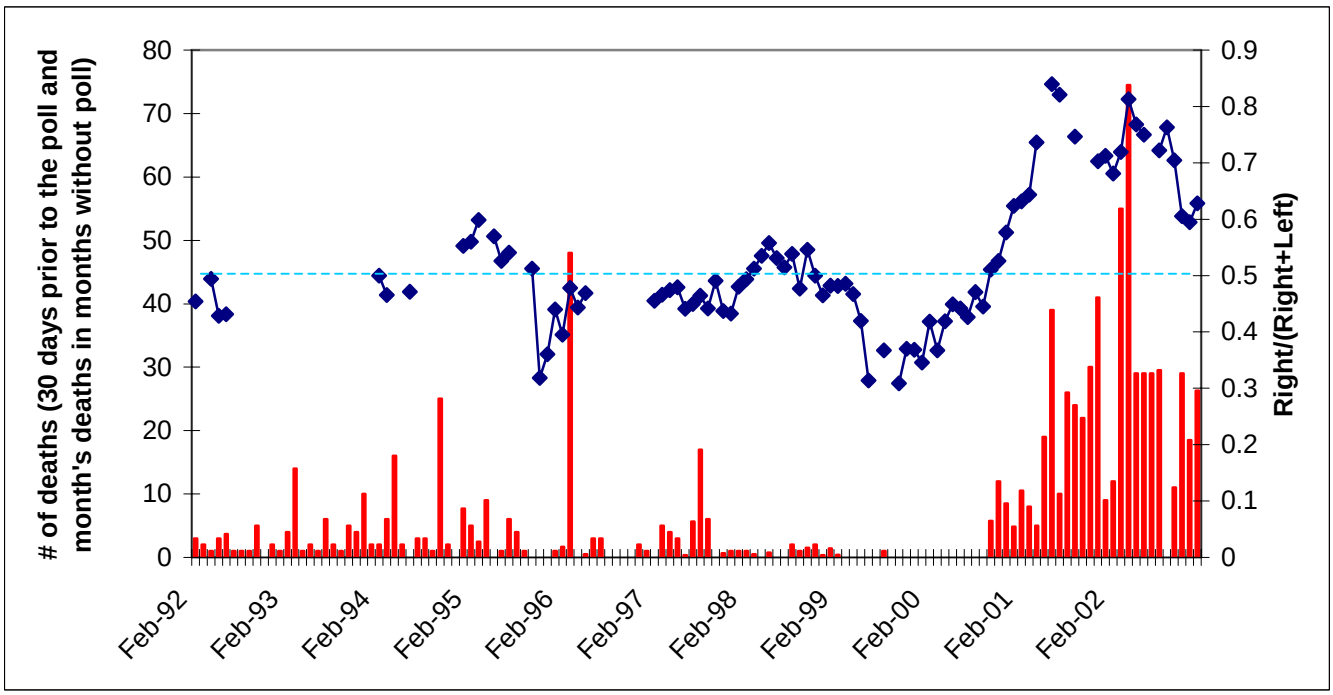


**Figure 3: Political support and deaths from terrorist attacks**

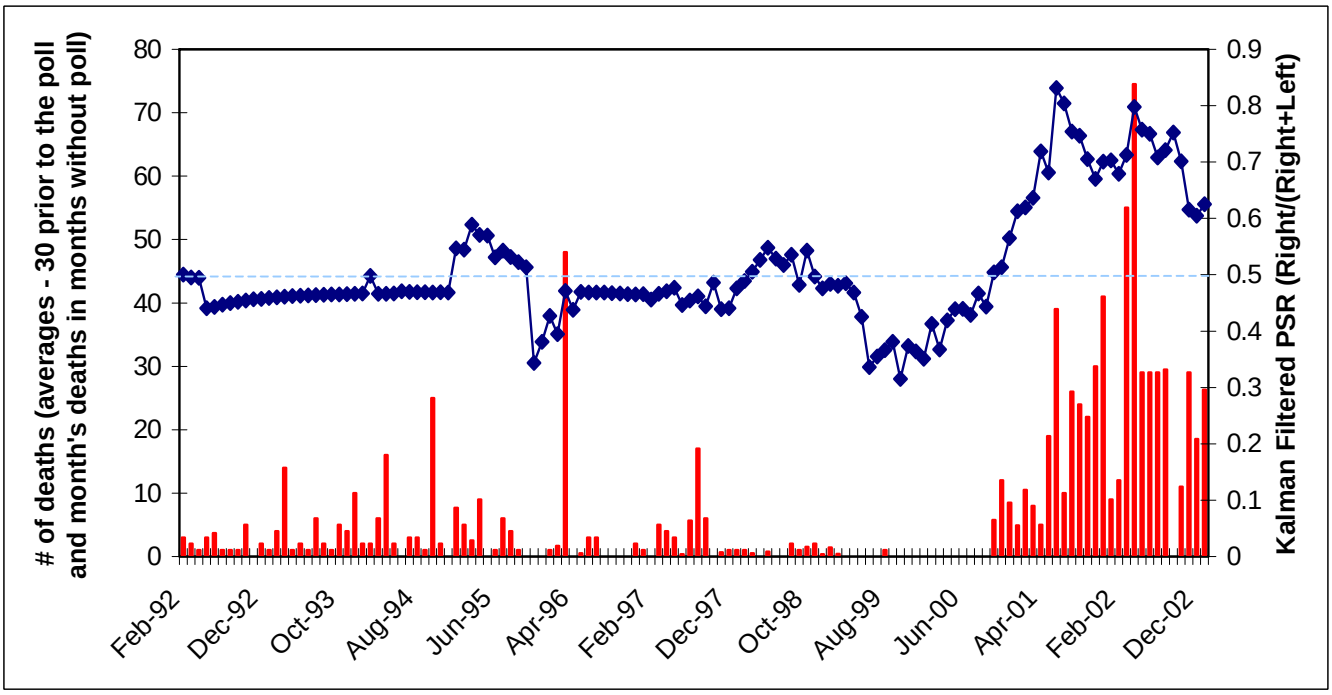
a. All available polls (x-axis does not reflect time interval between contiguous polls)




b. Monthly averages



c. Kalman Filtered Political Support Ratio (monthly averages)




d. Kalman Smoothed Political Support Ratio (monthly averages)

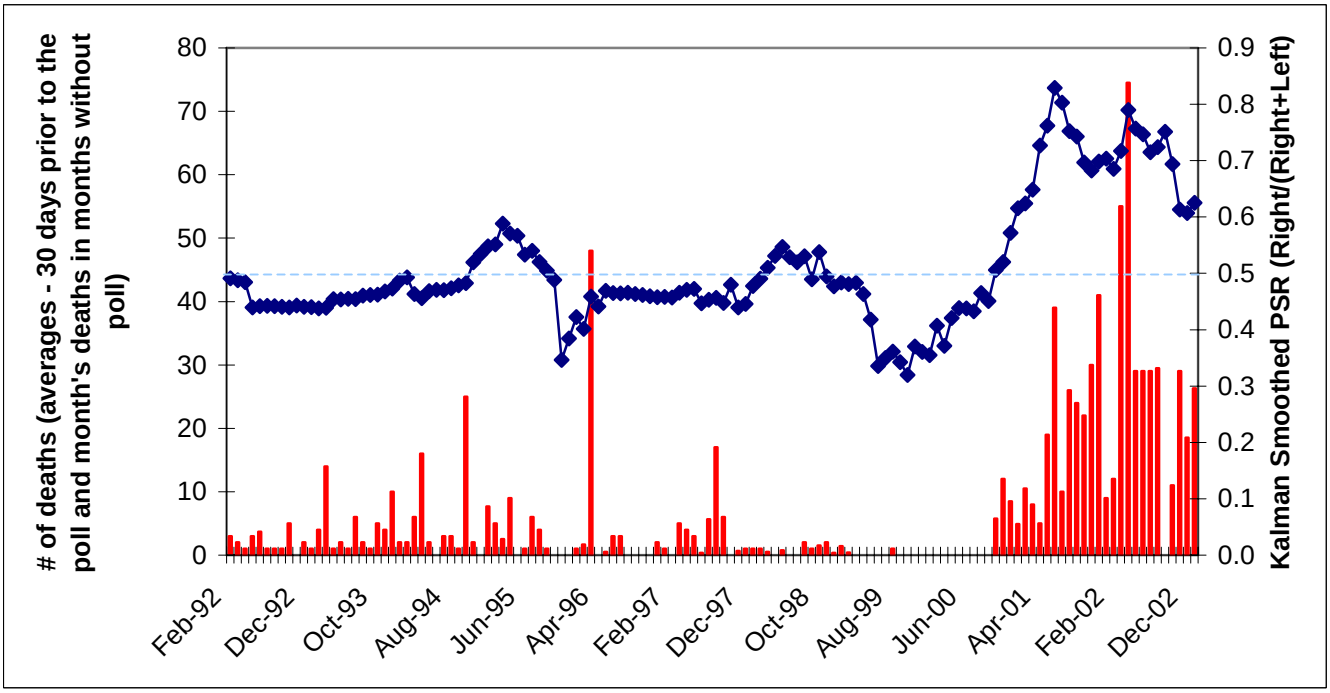


**Figure 4: CAD - comparison period is from the year preceding the Madrid Peace Conference**

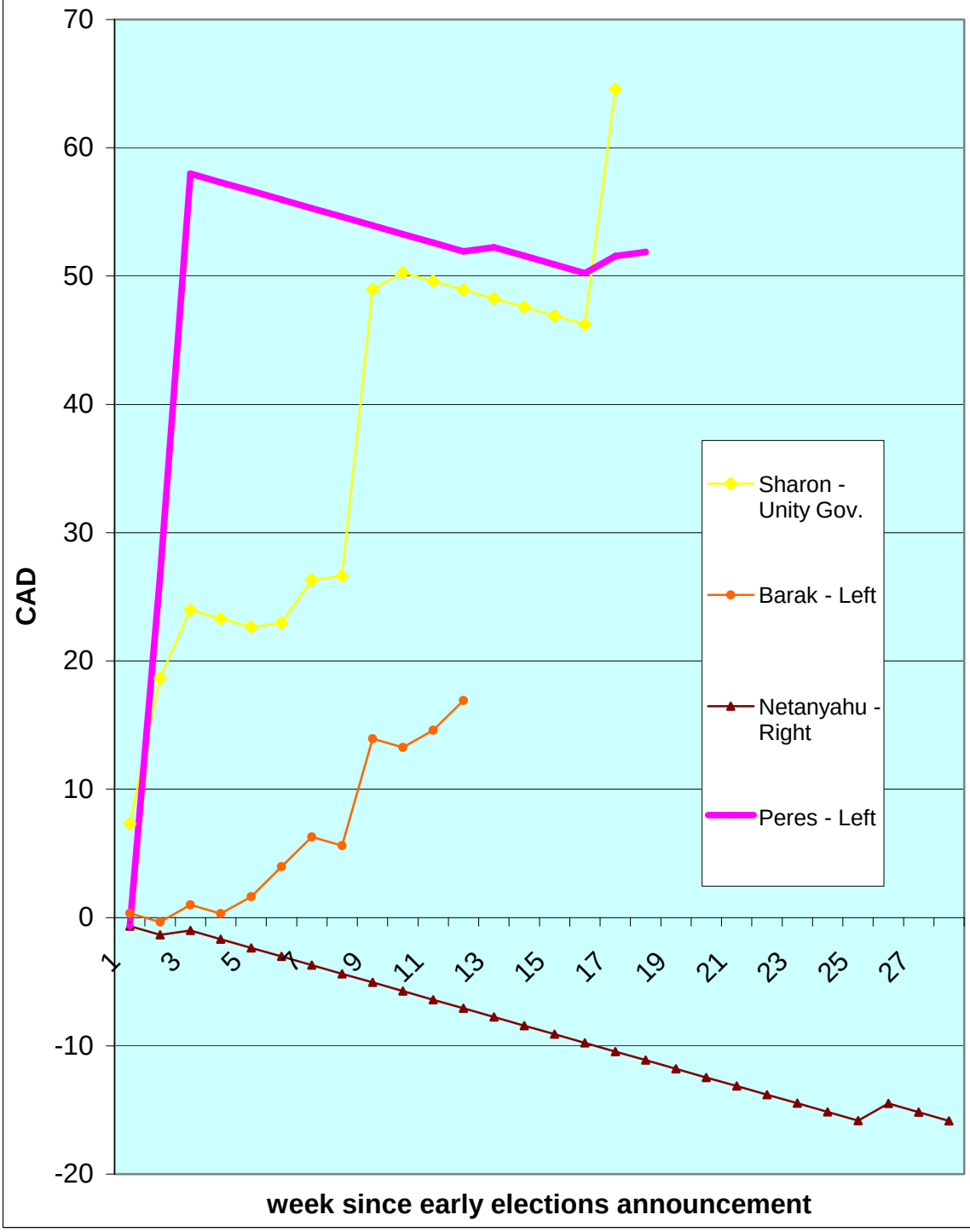


**Figure 5: CAD - comparison period is from the preceding elections (under previous gov.)**