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

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Abstract

This paper investigates the interaction between terrorist 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 on the interaction between terrorism and electoral outcomes. First, we expect that the relative support for the rightist party increases after periods with high levels of terrorism and decreases after relatively calm periods. Second, the expected level of terrorism is higher during the leftist party's tenure in office compared to the one expected during the rightist party's term in office. We test the hypotheses above using a newly culled data set on terrorist attacks in Israel and the occupied territories between 1990 and 2003. The first hypothesis is strongly supported by the available data obtained from public opinion polls on the Israeli electorate's intent of voting. We use event study methods and likelihood ratio tests to evaluate the second hypothesis, as electoral outcomes are endogenous to the level of terrorist attacks. The results support our theoretical prediction for three of the four Israeli governments in the studied time period. Accordingly, we observe an increase in terrorist attacks during leftist governments and a decrease in terrorist attacks during rightist governments.

KEYWORDS: Terrorism, Electoral Outcomes.

JEL Classification: D7, N4.

1. Introduction

Three hundred and ninety terrorist 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, the Israeli-Palestinian conflict is not characterized by continuous and uninterrupted violence. Rather this conflict exhibits marked fluctuation between periods of relative calm followed by bloody cycles of violence. Nowadays this conflict is going through an extremely violent period plagued with attacks and retaliations. This latest cycle of violence that began in September 2000 was preceded, however, by three very quiet years in terms of fatal casualties. That quiet period, in turn, was itself preceded by a violent one which arguably began in 1994, ending the quiet years that followed the first Palestinian uprising (Intifada).¹

The number of fatal casualties is not the only variable that exhibits a cyclical behavior since the beginning of the peace process. The Israeli Prime Minister's political affiliation seems to change from the right wing party to the left wing party, and conversely, every time the office is up for grabs. In the studied period, the Likud government led by Shamir was replaced in 1992 by the Labor government led by Rabin. This Labor government, in turn, was replaced by the Likud government of Benjamin Netanyahu

¹ A description of our data set, containing a precise definition of terrorist attacks and fatal casualties, appears in Subsection (4.1). Figure 1 depicts the monthly number of fatal casualties among Israeli citizens in the studied time period.

in 1996, which lost the 1999 elections against Ehud Barak of the Labor party. Finally, Barak was defeated in 2001 by Ariel Sharon from the Likud party. While the possibility that the level of terrorism might influence electoral outcomes was already mentioned in the Israeli popular press (Yael Gbirtz and Uzi Dayan, *Yediot Aharonot*, 10 January 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 voters and terrorist groups focusing on the Israeli-Palestinian conflict. This conflict is especially suited to conduct such a study for a number of reasons. Occupation and terrorism are the most salient issues in this country. Democratic elections occur periodically and political parties' positions with respect to the occupied territories are fairly well known to voters and terrorists alike. Consequently, any empirical relation between terrorism and electoral outcomes is likely to be evident in this case study.

We analyze a dynamic model of reputation that captures the salient characteristics of this conflict. In particular, we develop a game where nature chooses at the outset the identity of the Palestinian organization responsible for terrorist attacks. We differentiate between two types of Palestinian organizations. The main objective of one of the organizations is the establishment of a sovereign Palestinian state in the West Bank and Gaza Strip, part of the territories occupied by Israel in the 1967 Arab-Israeli war. We identify this group with the Palestinian Authority (henceforth PA). The second or-

ganization's main goal is the establishment of a sovereign Palestinian state according to British Mandate Palestine's borders; that is, including 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 to the extent that this might induce Israel to emancipate the occupied territories. Hamas, on the contrary, 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 designed to thwart terrorism as confiscating illegal weapons, actively chasing after and incarcerating terrorists as well as dismantling the terrorist infrastructure. Choosing not to suppress terrorists entails a cost for the PA. After observing the PA's choice, Israeli voters elect a party to hold office. Israelis don't know whether the PA or Hamas is responsible for the terrorist attacks.² Israelis value occupation but suffer a utility cost from terrorism. There are only two parties running for office, left and right. The only difference between these two parties is that the transition probability from occupation to emancipation is greater for a leftist government. Hence, Israelis vote for the left party only if at that particular point in time, given their beliefs about the identity of

²Although Hamas tends to publicly assume responsibility when any of its members commits an attack, Israelis may not know whether the PA was able or not 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.

the group responsible for the terrorist attacks, their utility from granting emancipation is greater than their utility from continuing the occupation. After observing the Israelis' move, the Palestinian organization carrying out the terrorist attacks chooses a level of effort in pursuit of such attacks. The actual level of terrorism is a random variable, the expected value of which depends on the exerted level of effort and the PA's self-policing choice. At the end of each period there are two nature moves. First, the realization of a random variable (whose distribution depends on the elected Israeli government) determines next period's political state: either occupation or emancipation. 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 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 with high probability that they are facing Hamas then the PA tries to separate itself by suppressing terrorism and exerting low effort at the last stage of every period. When enough separation is achieved, if the territories are still occupied the PA chooses not to combat terrorism, thereby increasing the expected level of attacks. By promoting an increase in the level of terrorism the PA seeks to impose costs on the Israelis to force them to grant emancipation. In equilibrium, Israelis always vote for the rightist party if they believe with high probability that Hamas is the group perpetrating the terrorist attacks. If instead Israelis believe that the PA

is behind the attacks, they vote for the leftist party only when the PA accommodates terrorists, whereas Israelis vote for the rightist party if the PA clamps 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 rightist party. In this range of beliefs the PA clamps down on terrorists and doesn't exert high effort in the pursuit of terrorist 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 continues to suppress terrorism, Israelis wouldn't suffer a cost from maintaining the occupation and would thereby try to perpetuate it. This is precisely the reason that drives the PA to accommodate terrorism: to impose costs on the Israelis in order to force them to grant emancipation. Israelis expect that maintaining the occupation will lead to a stream of high-level terrorist attacks, not because they are facing Hamas, but rather because the PA is not suppressing terrorism. Given that the PA's optimal strategy is to suppress terrorism once emancipation is granted, Israelis vote for the leftist party in this range of beliefs after observing that the PA accommodates terrorism.

Our analysis thus emphasizes that terrorism is mainly used to impose costs on the Israelis to force them to grant emancipation. Although current costs can be substantial, it is the expectation of high levels of terrorism in the future that convinces the Israeli

electorate that it is not worth maintaining the occupation. This provides a formalization of Pape's (2003) arguments.³ In addition to those arguments, our model also provides an explanation for relative calm periods. In those periods the PA is trying 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 has no incentives to end the occupation if it believes that terror won't stop once emancipation is granted.

The equilibrium of the theoretical model generates two precise empirical predictions on the interaction between terrorism and electoral outcomes. First, we expect that the relative support for the rightist party increases after periods with high levels of terrorism and decreases after periods of relative calm. Second, perhaps paradoxically, the model predicts that the expected level of terrorism is higher during the leftist party's tenure in office compared to the expected level of terrorism during the rightist party's tenure in office. Note that this prediction follows from the Palestinians' strategic considerations and not from different deterrence policies that could be implemented by the Israeli government.⁴

We test the hypotheses above using a newly culled data set on terrorism in Israel and

³Using an alternative approach, Kydd and Walter (2002) develop a model in which the main objective of terrorism is to stop the implementation of a peace treaty. According to their framework, terrorists terrorize to provoke attacks upon themselves which will ultimately increase the sympathy of moderates for the terrorists' cause. See de Figueiredo and Weingast (2001) for a formal differentiation of the two approaches.

⁴In 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 a consequence of the implementation of different deterrence policies (Enders and Sandler, 1993 and 2002; Brophy-Baermann and Conybeare, 1994).

the occupied territories between 1990 and 2003. The first hypothesis is strongly supported by the available data obtained from public opinion polls on the Israeli electorate's intent of voting. Accordingly, a marginal increase in the number of fatal casualties from terrorist attacks causes an increase in the relative support for the rightist party of 0.1 percent. The results are not affected when we control for the identity of the party holding office. Whether the Prime Minister at the time of the attacks belongs to the rightist party has no effect on the relative support of that party either.

To determine the validity of the second hypothesis we use a combination of event study methods together with likelihood ratio tests. The main results support our theoretical prediction for three of the four Israeli governments in the studied time period. Accordingly, we observe a statistically significant increase in the level of terrorism during the leftist party term in government and a statistically significant decrease in terrorism during the rightist party term in government. The unity coalition government leaded by Ariel Sharon between March 2001 and February 2003 is the only government that exhibits a pattern of terrorism that contradicts our analytical results. Given that this government was out of the ordinary for several reasons, we are confident that the obtained results strongly support our theoretical predictions.⁵

The obtained evidence leads us to conclude that indeed there exists an empirical

⁵The coalition government formed between 2001 and 2003 is a difficult government to characterize. In this period, although the prime minister belonged to the rightist party, the leftist party was not only an active partner in the ruling coalition, but also was the party with the largest representation in the Israeli parliament.

interaction between terrorist attacks and electoral outcomes along the lines described in the theoretical model at hand.

2. Historical Background of the Israeli-Palestinian Conflict

The historical background and evolution of the Israeli occupation and terrorist activities are complex and controversial. A thorough analysis of the conflict is outside the scope of the present paper. The goal of this section is to offer a concise timeline with some relevant facts to help the reader understand the theoretical model presented in Section 3.

The State of Israel was established on May 14, 1948. Following the declaration of independence a war broke between the new state and the armies of several Arab nations. Between January and July 1949 Israel signed armistice agreements with Egypt, Jordan, Lebanon and Syria, thereby officially ending the war. According to these agreements the Gaza Strip remained under Egyptian rule and the West Bank under Jordanian rule, until it was annexed to Jordan in April 1950. Despite these agreements, the Arab nations did not formally recognize Israel.

On June 5, 1967 the Six-Day War breaks out. During this war Israel conquered, among other territories, the West Bank from Jordan and the Gaza Strip and the Sinai Peninsula from Egypt. In November of the same year the U.N. Security Council adopted Resolution 242 calling for the Israeli withdrawal from territories occupied in the Six-Day

war to secure and recognized boundaries.

On March 26, 1979 a peace treaty between Israel and Egypt is signed. Accordingly, Israel withdrew from Sinai. The accord stipulated also that a self-governing authority would replace Israel's military government and civilian administration in the West Bank and Gaza Strip within five years. This last part of the accord didn't materialize.

In July 1988 King Hussein declared Jordan's administrative disengagement from the West Bank paving the way to bring about an independent Palestinian state. In October 1991, the Madrid Peace Conference provided the forum for the first formal public negotiations between Israel and a Palestinian delegation from the West Bank and Gaza Strip. The Palestinian Liberation Organization (PLO) supported the Palestinian delegation while Hamas vehemently opposed any negotiations with, or recognition of, Israel. The Palestinian participation in the Peace Conference clearly highlighted the dividing lines between Hamas and the PLO. These negotiations derived in the Oslo accords signed between Israel and the PLO in August 1993. According to the signed accord Israel recognized the PLO and the PLO committed itself to peace and to deleting the points in its covenant calling for the elimination of Israel. In May 1994, in the continuation of the peace process the Palestinian Authority is established to govern in most of the Gaza Strip and the Jericho region which are transferred to Palestinian control.

Consistent with its stated position Hamas opposed the Oslo accords in particular

and the peace process in general, seeing them as unacceptable compromises of the Palestinian claims over all of the territory of British Mandate Palestine.⁶

3. The Theoretical Model

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

3.1. Preliminaries

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

Time is discrete: $t = 0, 1, 2, \dots$ A nature move selects at the outset the group responsible for terrorism.⁷ Let $\rho_0 \geq 0$ be the prior probability at time zero that the PA

⁶Article 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, pp. 183).

⁷Assuming, along the lines of Mailath and Samuelson (2001), that there exists a small positive

is selected as the group carrying on the terrorist 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 terrorist attacks. Given a history of attacks, at the beginning of period t Israelis assign a probability ρ_t to the PA being the group choosing 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 clamps down on terrorists and when $k = 1$ the PA accommodates terrorists. Choosing not to suppress terrorists entails a cost of $c > 0$ for the PA.⁸ After observing the 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 under a leftist government, $\Pr(em|oc, g = l)$, is assumed greater than under a rightist government, $\Pr(em|oc, g = r) \geq 0$. To simplify notation we denote $\Pr(em|oc, g)$ as p_g .

After an Israeli government has been elected, the Palestinian organization perpetrating the terrorist attacks chooses a level of effort, $e \in \{\underline{e}, \bar{e}\}$, in pursuit of such attacks. The Israeli electorate only observes the realized level of terrorism but not the effort level chosen in the pursuit of attacks, nor the identity of the group choosing e . If the PA

probability that the Palestinian group in control of terrorism might change from one period to the next does not affect the model's results.

⁸This can be understood first as a reputation cost. This reputation cost leads in several instances to economic costs as foreign countries and international organizations are reluctant to financially support a regime tied to terrorist activity. Another interpretation might stress the inherent risk that the PA's government faces for not instituting the rule of law. Accordingly, the existence of several armed factions residing in the territory under the PA's control is a clear source of political instability.

decided to attempt to clamp down on terrorist activity, low effort yields a low level of terrorism, τ_l , with probability $\alpha \in (1/2, 1)$. With probability $1 - \alpha$ low effort results in τ_h . Conversely, high effort yields a low level of attacks with probability $1 - \alpha$, and a high level of attacks with probability α . When the PA does not suppress terrorism it influences the outcome distribution of terrorist attacks. In particular, if the PA chooses to accommodate terrorism, $\Pr(\tau_l|\underline{e}, k = 1) = \gamma \in (1 - \alpha, \alpha)$ and $\Pr(\tau_h|\underline{e}, k = 1) = 1 - \gamma$.⁹ At the end of each period the political state is realized. Emancipation is an absorbing state: once granted it cannot be rescinded, so the previously occupied territories remain a sovereign country in the future.¹⁰ 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 the players discount the future using the same discount factor $\beta \in (0, 1)$.

In every period Israelis preferences are represented by a standard von Neumann-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 and em is applicable otherwise, and $\{\tau_l, \tau_h\}$ is the set of feasible terrorists 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

⁹ 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.

¹⁰ This is not to deny that a territory can be reoccupied. Nevertheless, once emancipation is granted and a new nation is formed, it could be extremely costly to reoccupy it.

(i.e., $u^I(y, \tau_l) > u^I(y, \tau_h)$, $y = oc, em$).

The instantaneous preferences of the PA are represented by $w^{PA} : \{oc, em\} \times \{\underline{e}, \bar{e}\} \times \{0, 1\} \mapsto \mathbf{R}$ defined by $w^{PA}(y, e, k) := w(y, e) - kc$, where e reflects the PA's exerted level of effort, and k is equal to 0 when the PA decides to attempt to suppress terrorism and is equal to 1 otherwise.¹¹ We assume that for a given level of e and k the PA prefers a state of emancipation to 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 on whether to suppress or not terrorism the PA prefers to exert low effort rather than high effort (i.e., $w^{PA}(y, \underline{e}, k) > w^{PA}(y, \bar{e}, k)$). Hamas's payoffs are not defined as it always exerts high effort.

Several clarifications are in order here. In reality, Hamas is a complex organization. Like other social and political movements, Hamas has clearly stated goals and employs strategic decision-making in pursuit of those objectives. Even if one of the central goals stated in Hamas's Charter is the liberation of historic Palestine through holy war against Israel and establishing an Islamic state on its soil, the group might adapt its behavior according 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 Hamas. In that respect, our assumption reflects the prevailing image of Hamas among the Israeli electorate as an ideologically intransigent and politically rigid movement,

¹¹In order 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.

ready to pursue the destruction of Israel at any cost, with no limits or constraints.¹²

Contrary to Hamas, the PA adopted a two-state solution approach to the conflict – Israel within its 1967 borders and an independent Palestinian state in the West Bank and Gaza Strip. The divergence between Hamas and the PA regarding ultimate objectives and means is the source of their peculiar relationship of coexistence. At times, their interests collide and the PA implicitly grants Hamas operational freedom in the pursuit of terrorist activity. In other occasions the PA determines that terrorist attacks might undermine its goals, prompting the PA to take measures against Hamas and its members (Kimmerling and Migdal, 2003).

The next subsection solves for the unique pure strategy Markov Perfect Equilibrium of this game.

3.2. Equilibrium Characterization

In this section we characterize the unique pure strategy Markov Perfect Equilibrium of this game in which strategies depend only on the current state of the world and not on the entire history of the game.

In the presence of uncertainty concerning the Palestinians' type, the state of the system at period t consists of the Israelis' posterior probability that the PA is responsible

¹²Hroub (2000) and Mishal and Sela (2000) develop a thorough study of Hamas. See de Figueiredo and Weingast (2001) and Kydd and Walter (2002) for studies of terrorism from a rational choice perspective in which the radical group adopts a nontrivial strategy.

for terrorism together 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 $\sigma^{PA} : S \times \{l, r\} \mapsto \{0, 1\} \times \{\underline{e}, \bar{e}\}$, is a function of the state S and the government elected by the Israelis in the current period. This strategy determines whether the PA accommodates or attempts to suppress terrorism and what level of effort exerts on terrorist 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 current period's chosen political party in Israel. Hamas has a trivial strategy, as it makes no choices.

Given a realized level of terrorism $\tau \in \{\tau_l, \tau_h\}$ and prior beliefs ρ , let $\varphi(\rho|k, \tau)$ denote the Israelis' posterior beliefs that the PA is carrying the terrorist attacks conditional on the PA's decision on self-policing. A pure strategy Markov Perfect equilibrium is a tuple $\{\hat{\sigma}^{PA}(S|g), \hat{\sigma}^I(S|k), \varphi(\rho|\tau, k)\}$, such that $\hat{\sigma}^{PA}$ and $\hat{\sigma}^I$ are best-responses to each other for all S , and Israelis use Bayes rule to update their posterior probabilities. Formally, consider the appropriate Bellman equation for every player:

$$\begin{aligned}
V^{PA}(S) = & \max_{\sigma^{PA}} \{w^{PA}(\hat{\sigma}^I(S|k), \sigma^{PA}) + \beta[p_g(\hat{\sigma}^I(S|k), \sigma^{PA}, S)V^{PA}(em, \rho') \\
& + (1 - p_g(\hat{\sigma}^I(S|k), \sigma^{PA}, S))V^{PA}(oc, \rho')]\}
\end{aligned} \tag{3.1}$$

and

$$V^I(S) = \max_{\sigma^I} \{U^I(\sigma^I, \hat{\sigma}^{PA}(S|g), S) + \beta[p_g(\sigma^I, \hat{\sigma}^{PA}(S|g), S)V^I(em, \rho') + (1 - p_g(\sigma^I, \hat{\sigma}^{PA}(S|g), S))V^I(oc, \rho')]\} \quad (3.2)$$

where $w^{PA}(\hat{\sigma}^I(S|k), \sigma^{PA}, S)$ denotes the instantaneous utility of the PA as a function of the state S and the players' Markov strategies; $U^I(\sigma^I, \hat{\sigma}^{PA}(S|g), S)$ is the Israelis' expected instantaneous utility, defined by

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

and $p_g(\sigma^I, \sigma^{PA}, S)$ denotes the transition probability from state S to state (em, ρ') as a function of the strategies σ^I and σ^{PA} . A pure strategy Markov perfect equilibrium is a strategy combination together with posterior beliefs such that $\hat{\sigma}^{PA}$ solves (3.1), $\hat{\sigma}^I$ solves (3.2) 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 $\hat{\sigma}^{PA}(S|g) = (k, \underline{e})$,

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

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 can characterize the unique pure strategy Markov perfect equilibrium by exploiting several features of the model. Note first that for any S the PA chooses $e = \underline{e}$. Behaving differently is simply more costly and cannot influence, in equilibrium, the Israelis' posterior beliefs.¹³ Hence, the continuation value (the discounted expected net present value) for the PA after emancipation is realized, for any ρ , is

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

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

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

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

which is monotonically increasing in ρ .

¹³More precisely, if in any period the PA were to choose high effort, then Israelis would not adjust their posterior in response to the signal in that period, and so the PA would optimally choose low effort, disrupting the equilibrium.

In what follows we impose the following two restrictions:

$$\gamma < \frac{[u^I(em, \tau_l) - u^I(em, \tau_h)] \alpha - [u^I(oc, \tau_h) - u^I(em, \tau_h)]}{u^I(oc, \tau_l) - u^I(oc, \tau_h)}, \quad (3.3)$$

and

$$u^I(em, \tau_l) - u^I(oc, \tau_h) > [u^I(oc, \tau_l) - u^I(em, \tau_h)] \frac{(1 - \alpha)}{\alpha}. \quad (3.4)$$

The first inequality imposes an upper bound on γ , the parameter that characterizes the expected level of terrorist attacks when the PA decides not to stop terrorism. This condition ensures that the increase in expected terrorist attacks when the PA accommodates terrorism is significant enough such that to try to maintain the occupation of the territories is no longer a dominant strategy for the Israelis irrespective of their beliefs. The second inequality is a technical requirement that guarantees that the range of γ is not empty.¹⁴

Given the stated assumptions, in a state of occupation, contrary to the analysis above, the PA's optimal strategy depends on the Israelis' strategy. Clearly, in equilibrium Israelis elect a left wing government whenever the continuation value from 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 govern-

¹⁴These conditions are not very restrictive. As an example, if we assume 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 $b > a$, then the second inequality is satisfied whenever $\frac{a}{b} > \frac{1-\alpha}{\alpha}$; that is, when the benefits from continuing the occupation for a given level of terrorist attacks does not significantly exceed the benefits from granting emancipation.

ment. Given the Israelis' behavior and beliefs, the PA might find profitable in certain states to accommodate terrorism to lower the value that Israelis accrue from maintaining the occupation. In particular, note that if the PA clamps down on terrorists $V^I(em, \rho) < V^I(oc, \rho)$ for every ρ , implying that $\hat{\sigma}^I((oc, \rho)|k = 0) = r$. For a certain range of ρ , however, if the PA does not suppress terrorism whenever the territories are occupied $V^I(em, \rho|k = 0) > V^I(oc, \rho|k = 1)$; that is, the PA accommodates terrorism to induce the Israelis to favor emancipation.¹⁵

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

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

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

¹⁵Several researchers posit that this is indeed the main strategy used by terrorists. This behavior is in accordance with Oots (1986), who argues that terrorists use this strategy as an exchange medium for concessions.

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

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

Accommodating terrorism is costly. Therefore, the PA doesn't accommodate terrorism unless that action has an effect on the Israelis' strategy. Since $\hat{\sigma}^I((oc, \rho)|k) = r$ for $\rho < \rho^*$ irrespective of k , then $\hat{\sigma}^{PA}((oc, \rho)|g) = (0, \underline{e})$ in that range of beliefs. Although accommodating terrorism influences the Israelis to vote for the leftist party when $\rho > \rho^*$, such an action is not always profitable for the PA. The PA accommodates terrorism in this range of beliefs when its cost satisfies the constraint below:

$$c \leq \beta(p_l - p_r) \left[\frac{w^{PA}(em, 0, \underline{e})}{1 - \beta} - V^{PA}(oc, \rho) \right]; \quad (3.5)$$

that is, the PA doesn't suppress 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.¹⁶

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

¹⁶Note that the PA accommodates terrorists even if Hamas is responsible for the terrorist attacks. Hence the decision whether to suppress or accommodate terrorism does not reveal the identity of the group responsible for terrorist attacks.

Proposition 1. *Suppose that conditions (3.3), (3.4) and (3.5) hold. There exists a unique pure strategy Markov perfect equilibrium such that, if the territories are under Israeli occupation:*

1. *For $\rho < \rho^*$ the PA suppress terrorism and never exerts a high effort in the pursuit of terrorist attacks. Israelis elect the rightist party to hold office irrespective of the PA self-policing action.*

2. *For $\rho \geq \rho^*$, the PA accommodates terrorism but exerts low effort in the pursuit of terrorist attacks. Israelis elect the leftist party to hold office whenever the PA accommodates terrorism, whereas they elect the rightist party to hold office when the PA clamps down on terrorism.*

If the territories were emancipated in the past, the PA suppress terrorism and exerts low effort in the pursuit of terrorist activity and Israelis elect either the rightist or the leftist party to hold office, irrespective of the PA's self-policing decision.

In every case beliefs are updated according to Bayes rule.

There are two precise empirical implications to be drawn from Proposition 1. First, repeated realizations of a high level of terrorism increase the Israelis' beliefs that Hamas is the Palestinian organization behind the attacks. These beliefs induce the Israeli electorate to shift rightward. That is, the theoretical model predicts that the public support for the rightist party increases after periods with high levels of terrorism and decreases after relatively calm periods. Second, perhaps paradoxically, the model predicts that,

while the territories are under Israeli occupation, the equilibrium expected level of terrorism is higher during the leftist party's term in office compared to the expected level of terrorism during the rightist party's term in office. The reason behind this result is that Israelis elect a rightist government when they believe that there is a high probability that Hamas is behind the terrorist attacks. Given these beliefs, the optimal strategy for the PA is to try to lower the expected level of terrorism as much as possible, choosing $\hat{\sigma}^{PA}(S|g) = (0, \underline{e})$. On the contrary, when Israelis believe that the PA controls the level of terrorism, the PA doesn't suppress terrorism in order to increase the expected level of terrorist attacks, thereby decreasing the Israelis' benefits from occupation. As continuing the occupation is no longer enticing for the Israelis given the PA's strategy, they elect for office a leftist government to increase the probability of granting emancipation.

The next section empirically assesses the validity of the two theoretical results.

4. Empirical Analysis

This section tests the implications of the theoretical model presented above using public opinion polls and a newly culled data set on terrorist attacks in Israel and the occupied territories between 1990 and 2003.

4.1. Data

Definitions of terrorism vary widely. A certain act can be defined as a terror act in the views of one person, and at the same time be defined as a “fight for freedom” in the views of another. The particular definition of terrorist attacks that we use for the construction of our data set is the one stated by the US State Department, contained in Title 22 of the United States Code, Section 2656f(d). Accordingly,

“– The term ‘terrorism’ means premeditated, politically motivated violence perpetrated against noncombatant targets by sub national groups or clandestine agents, usually intended to influence an audience.

– The term ‘international terrorism’ means terrorism involving citizens or the territory of more than one country.

– The term ‘terrorist group’ means any group practicing, or that has significant subgroups that practice, international terrorism.”

Specifically, our data set on terrorists’ attacks contains daily information on each and every *fatal* terrorist attack against *noncombatants* that occurred on *Israeli soil* from October 31, 1990 until May 31, 2003.¹⁷ Several explanations on the used definition of terrorist attack are in order.

a. Fatal: Due to the collection procedure constraints, only attacks in which someone

¹⁷Our available data expands to 1949. The reason we use data just from 1990 onwards is because our theoretical model fits only the period after the beginning of the peace process.

besides the terrorist died were included.

b. Noncombatants: This term is interpreted to include, in addition to civilians, military personnel who at the time of the incident are unarmed and/or not on duty.

c. Israeli Soil: This includes 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 two newspapers archives (Ma'ariv and Ha'aretz).¹⁸ To the best of our knowledge, this is the most accurate and comprehensive unclassified data set regarding fatal terrorist attacks against noncombatants on Israeli soil. The data are depicted in Figure 1. Summary statistics appear in Table 1.

To test the impact of terrorism on the Israeli electorate we gathered data on public opinion polls about the intent of voting of Israeli citizens. We collected all the polls published by Ma'ariv, a leading Israeli newspaper, during the studied time period. The published polls were first conducted by Gallup Israel. Later on, the polls published by Ma'ariv were conducted by Market Watch, and since November 2002 the published polls are conducted 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 terrorist attacks only indicate attacks in which someone besides the terrorist died. Thus, foiled attacks as well as “unsuccessful” attacks in terms of producing fatalities

¹⁸See Berrebi (2003) for a detailed description of the data set and its sources.

are not included. Terrorist attacks outside Israeli soil were not included either. Since the just mentioned types of attacks might impact the Israeli electorate's views we might be omitting relevant terrorist events. Second, the collected data on public opinion polls doesn't appear on a regular basis with a high frequency of observations before scheduled elections, and long intervals without observations right after the elections. Additionally, Ma'ariv (the newspaper we extracted the data from) used several different polling companies during the studied period. This may introduce additional noise to the results as different companies may use different methods to collect and analyze the data. Finally, the persistence of individuals' political preferences reflected in public opinion polls is likely to cause problems of serial correlation.

Besides the problems just outlined, we must pay particular attention as well to the electoral system in Israel. Israel has an electoral system 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 but instead the president nominates a prime minister who has to obtain the support of a majority of the parliament members in a confirmation vote.¹⁹ Elections are supposed to take place every four years but the

¹⁹Beginning with the elections in 1999 the Israeli parliament introduced a system of direct elections for the prime minister in which voters voted for individual prime minister candidates separate from the vote for parties vying for seats in the parliament. Given the short and turbulent terms of the two prime ministers elected under this system, the direct elections concept was discontinued in 2001 and the previous system was restored.

parliament can decide by an ordinary majority to dissolve itself and call for unscheduled early elections.²⁰ This means that the timing of elections is endogenous to the political environment. In fact, the elections for all the Knessets in the studied time period were held before the original scheduled date. In 1992, 1996, 1999 and 2001 the parliament called for early elections, while the elections for the sixteenth (2003) Knesset were brought forward by the initiative of the prime minister.

The endogeneity of the electoral schedule introduces another complication to our empirical analysis. In the theoretical model the timing of events within a period is exogenous to the realization of terrorist attacks. In practice, however, we expect that the level of terrorism is not only a function of the ideology of the current government, but also of the perceived stability of that government. Palestinians may increase the level of terrorism to bring the collapse of a government that they dislike, or 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 this particular problem we restrict the part of our empirical analysis that estimates the effect of the Israeli government's ideology on the level of terrorist attacks to the period between the fall of a government and the scheduled elections for the appointment of a new one. During that period we can treat upcoming elections as exogenously given since their date is announced together

²⁰Under the direct vote for prime minister system, the prime minister, as well as the parliament, could notify the president of early elections. After the abolishment of that system, the prime minister can recommend to the president to call for early elections, but the parliament can block that initiative.

with the collapse of a government.

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

4.2. Empirical Strategy and Results

4.2.1. 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 rightist party increases during periods with high levels of terrorism and decreases during periods of relative calm.

A simple count of deaths from terrorist attacks several months before every election in the studied period is quite revealing. Figure 2 presents the number of deaths from terrorist attacks 150 days prior to elections together with the outcome of the elections. From this circumstantial evidence follows that the leftist party (Labor) won every election when less than 12 people died from terrorist attacks during the five months that preceded the election. In contrast, the rightist party (Likud) won the elections when the number of fatal casualties from attacks during the five months that preceded the election was 48 or higher. This evidence, obviously, is far from conclusive as we cannot conduct a meaningful statistical analysis with only five observations.

To increase the number of observations we collected the results of public opinion polls on the intent of voting of the Israeli electorate. The results of these polls act

as a proxy to electorate outcomes and help us overcome the difficulty created by the simultaneous relation between terrorism and electoral outcomes. Panel (a) of Figure 3 displays the basic data. This figure shows the right party’s percentage share of the two party vote and the numbers of fatal casualties from terrorist attacks 30 days before the poll administration date.²¹ These data indicate some patterned relation between the two variables of interest. Most notably, the Israeli electorate’s support for the rightist party increases in violent periods and decreases in quiet ones.

To conduct a formal statistical analysis we use the Prais-Winsten estimator. This estimator corrects the first-order serially correlated residuals existent in the data according to standard diagnostic tools.²²

Table 3 depicts the results of the estimation. From this table follows that a marginal increase in the number of fatal casualties from terrorist attacks causes an increase in the support for the Likud party of 0.4 percent evaluated at the averages. This result is not affected by the identity of the party holding office. Moreover, the results are not affected even if the prime minister at the time of the attack belongs to this party.²³ Using different lengths of time to calculate the total number of deaths from terrorism does not affect the results.

²¹In panel (b) we average the available polls administrated within the same month. This is to create a series of evenly spaced observations, which we use to overcome the existent serial correlation problem in the data.

²²Both the Breusch-Godfrey test and the Durbin’s alternative test statistic indicate that the residuals follow an AR(1) process.

²³We don’t present in Table 3 the model that includes the interaction variable because the coefficient of this variable is not statistically significant.

Given some of the already mentioned problems with the collected data (namely, the polls don't appear on a regular basis and several different polling companies conducted the collected surveys during the studied period), a significant part of the observed variability might be a consequence of noise produced by sampling error and not a reflection of true movements in public opinion. To accurately separate movements 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 the one developed by Green et al. (1999) is that we incorporate a covariate (deaths from terrorist attacks) that influences the equilibrium public support ratio for the rightist party.

The algorithm known as the Kalman filter consists, in practice, of a set of algorithms that allows us to optimally separate true movements in public opinions from noise, reducing the amount of measurement error by accumulating information across surveys and smoothing the time series. The Kalman filter delivers, under some regularity assumptions, smoothed estimates that have the smallest mean squared error of any linear weighting scheme applicable to a sequence of polls (Hamilton, 1994). In addition, this methodology allows us to interpolate missing observations and calculate the standard error of these interpolations, gauging the state of opinion during periods when polls were not conducted. This is especially important in our estimation given the available data set, with a high frequency of observations around electoral periods and long intervals

without observations as we move farther away from scheduled elections.

Formally, we want to estimate the impact of terrorism on the true support ratio for the rightist party at any point in time, TS_t . Following our theoretical framework we suppose that the true support for the rightist party is mainly influenced by its prior support and the level of terrorism in the immediate past. The resulting specification is given by

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

where τ_t is the total number of fatal casualties from terrorist attacks 30 days before the poll administration date, and ε_t is the white noise produced by random fluctuations in public opinion. The constant θ_0 allows for the possibility of the existence of a trend in the relative public support for the rightist party.

The additional noise introduced by sampling error is reflected in the fact that we don't observe the true political support ratio, but only the polls' estimated support, PSR_t , where

$$PSR_t = TS_t + \nu_t,$$

with ν_t being the noise of the measurement process.

Following the Kalman filter algorithms, we generate two alternative series of the public support for the rightist party based on the observed opinion polls: the first series consists of filtered observations while the second series consists of smoothed observations.

To generate filtered estimates we move forward in time, iterating the polls until the last one available in our data set. In particular, we set the first filtered observation, F_1 , equal to the polls' estimated support, PSR_1 , and adjust succeeding filtered observations according to

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

where W_t is an estimator of the public support ratio's mean squared error at time t .²⁴ For periods with missing observations the filtered value is given by

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

On the contrary, to obtain smoothed estimates we use the filtered estimate and 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 ω_t is, as W_t , an estimator of the public support ratio's mean squared error.²⁵

²⁴The estimator W_t depends on the current uncertainty about the true support for the rightist party (partly influenced by $Var(\varepsilon)$) and on the random sampling error of the current poll ($Var(\nu_t)$). See Green et al. (1999) for the complete characterization of W_t .

²⁵Unlike W_t , the specification of ω_t takes into account the uncertainty about the true support for the rightist party and the random sampling error of the polls for all the available observations. The full

Panels (c) and (d) of Figure 3 depict the filtered and smoothed series, respectively. We again use the Prais-Winsten estimator to assess the impact of terrorist attacks to the popular support ratio for the rightist party, now applied to the modified data. Table 4 presents the results using the filtered data and Table 5 presents the results for the smoothed data. As it is readily seen from these two tables, the reached conclusions using raw data are maintained. In particular, the effect of fatal casualties on the popular support ratio is still positively significant. Although its coefficient is not as large as before, the observed decrease is not significant. From Tables 4 and 5 follows that a marginal increase in the number of fatal casualties from terrorist attacks causes an increase in the support for the Likud party in the order of 0.3 to 0.35 percent evaluated at the averages, instead of 0.4 percent as obtained according to Table 3.

4.2.2. Impact of the Elected Israeli Government on the Level of Terrorism

A direct implication from our theoretical model is that the level of terrorism and the political environment are simultaneously determined. This introduces the first difficulty while testing the second hypothesis. Additionally, our empirical estimation needs to take into account that not only electoral outcomes, but also the elections' timing, are endogenous to the level of terrorism. As a consequence, we can't use an ordinary regression model to test the effect of the elected Israeli government on the level of

derivation of ω_t can be found at Green et al. (1999).

terrorism. Those are the reasons that lead us to use a combination of event study methods together with more conventional likelihood ratio tests to assess the validity of the second hypothesis.

We adapt event study methods to analyze the impact 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 this event on the realizations of a variable of interest.²⁶ In our case, by taking electoral outcomes as the event of interest, we are able to measure their impact on the level of terrorism.

As already discussed above, elections' dates in Israel are not always exogenously determined. In fact, only during the period between the fall of a government and the scheduled elections for the appointment of a new one we can treat the date of the upcoming election as exogenous, known both by the Israeli electorate and terrorists alike. Therefore, these are the periods that we use for our analysis.²⁷

Another advantage of the used statistical method is that it allows us to perform pairwise comparisons between contiguous governments, thereby distinguishing between governments from the same political party in different time periods. Immediate history has a significant role both in our theoretical model and in Israeli politics. Thus, it would

²⁶See Campbell et al. (1997) for a general description of event study methods and Abadie and Gardeazabal (2003) for an application of this method to study the impact of terrorism on stock returns in Spain.

²⁷We obtain similar results when we ignore the fact that elections' dates are endogenous and carry the analysis for the entire term in office for every government.

be a mistake to attribute the same effect to leftist governments in different periods, as well as to different rightist governments.

To conduct an event study analysis, we take the day when the date of the forthcoming elections is announced as the day of the event. We define $t = 0$ as the event day. There are four events in our sample. For every event, we choose two different periods as estimation windows, $[T_0, T_1]$. We take for the first period the year preceding October 31, 1991 and compute the average number of fatal casualties from terrorist attacks during that year. We believe this statistic is a good proxy for τ_0 . The second period taken for the estimation windows is the event window during the preceding government. This period provides a proxy for τ_{t-1} . According to the theoretical model, the relevant statistic is a convex combination of the two.²⁸ If the analysis delivers 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 determined by the inauguration date of a new government.

For each event we compute the average number of weekly fatal casualties from attacks during the estimation window, $\bar{\tau}$. For every week between 0 and T_2 we calculate the abnormal number of deaths from terrorist attacks, AD_t , defined as the observed number

²⁸In principle all the information needed should already be included in τ_{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 minus $\bar{\tau}$; that is,

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

We interpret the abnormal number of deaths from attacks over 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,

$$CAD_T = \sum_{t=T'_1}^T AD_t.$$

If CAD_T oscillates around zero, then the studied event has no effect on the level of terrorism. On the contrary, when CAD_T is significantly different from zero we must conclude that the event has an impact on the level of terrorism. In particular, if the theoretical predictions are correct, then the CAD_T should be positive and increasing for a leftist government following a rightist government, and negative and decreasing for a rightist government that follows a leftist government. When compared to τ_0 , CAD_T should be positive for a leftist government and negative for a rightist government.

Figures 4 and 5 plot the cumulative abnormal deaths for every government in the studied period when compared to τ_0 and τ_{t-1} . The obtained CAD_T s are, for the most part, consistent with the theoretical analysis. The evidence supports the hypothesis that

the level of terrorism increases during the tenure of a left wing government both when compared to τ_0 and to τ_{t-1} that corresponds to the preceding right wing government. Opposing results are obtained, for the most part, for right wing governments. These trends are especially evident for the governments of Peres, Nethanyahu, and Barak. The CAD_T corresponding to the unity coalition government led by Sharon between 2001 and 2003 shows a pattern contrary to the one expected for a rightist government. We relate to this finding cautiously though, given that this government is atypical for the reasons already stated 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 given that deaths from terrorist attacks are count data best described by a Poisson distribution. Therefore, we carry the more conventional likelihood ratio test assuming that deaths from terrorist attacks follow a Poisson distribution. For the purposes of this test we carry pairwise comparisons of realizations of τ between 0 and T_2 of contiguous governments, as well as a comparison of every government with the realization of τ between October 31, 1990 and October 30, 1991. Our null hypothesis is that the two compared samples are drawn from a Poisson distribution with the same λ .

The results appear in Table 6. These results support the conclusions reached by the event study analysis. In particular, the likelihood ratio test shows that the level of terrorism is significantly higher during the leftist party tenure in office compared to the

level before the beginning of the peace process and to the level of the preceding rightist party. The opposite conclusion is reached for the rightist government of Benjamin Netanyahu. All these results are in accordance with the suggestions of the theoretical model. As before, the unity coalition government led by Sharon exhibits a higher level of terrorism compared to both the exogenous level and the level of terrorism observed during its predecessor leftist government.

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 the rightist party in Israel increases after periods with high levels of terrorism, and that the expected level of terrorism is higher during the leftist party's tenure in office. We tested the predictions above combining data on the Israeli electorate's intent of voting with a newly culled data set on terrorist attacks in Israel. The findings of the empirical analysis support the theoretical predictions. Namely, we observe that a marginal increase in the number of fatal casualties from terrorism causes a significant increase in the relative support for the rightist party. Moreover, event study analysis and likelihood ratio tests show that, in general, the level of terrorism increases during the leftist party's tenure in office and decreases during the rightist party's tenure.

A justification is in order with regard to the chosen modeling strategy. The model

presents the conflict asymmetrically. Accordingly, Palestinians commit terrorist attacks and Israelis elect governments. A more accurate reflection of the conflict would take into account that Israeli violence and state terrorism against Palestinians also influence the political preferences of the Palestinians as well as their chosen retaliatory strategy. Although such a model seems plausible theoretically, several difficulties would preclude us from being able to estimate its predictions. The most important is perhaps the absence of a political system in the territories under Palestinian control that would allow for a democratic election of a political party different from 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. In any event, the empirical results in Goldstein et al. (2001) show that while Israel reciprocated Palestinian cooperation and conflict during the 1990s, Palestinians did not reciprocate Israel's. This finding casts a serious doubt on the empirical validity of this alternative approach.

We also must be cautious while interpreting our empirical findings. These findings are also consistent with an alternative model that focuses on terrorism-deterrence technology. Accordingly, terrorist groups want to maximize the number of terrorist attacks irrespective of the political environment in Israel. We observe a lower number of attacks when the right wing party is holding office simply because this party implements tougher antiterrorism policies. It is then natural to expect that the electorate's preferences shift

rightward during periods with high levels of terrorism.

That deterrence policies have an effect on terrorism fluctuations is an empirical fact (Enders and Sandler, 1993 and 2002; Brophy-Baermann and Conybeare, 1994). We are somewhat skeptical of embedding the terrorism-deterrence argument in an electoral cycles framework, however, because of the implications of such a model on the behavior of the political parties. In particular, this alternative approach renders that political parties do not value holding office. As already pointed out, our results show that the support for the right wing party increases in periods with high level of terrorism, even if the right party is holding office during those periods. From these findings follows that the leftist party has greater incentives than the rightist party to lower the number of fatal casualties from terrorism. This effect should certainly induce the left wing party to enact deterrence policies that lower as much as possible the expected number of victims.²⁹ If indeed the leftist party adopts tougher policies then the increase in the level of terrorism can only be explained by focusing on the terrorists' strategies.³⁰

In summary, 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. On top of that, it delivers precise

²⁹There is no reason to believe that one party is more efficient in terrorism deterrence than the other. The Israeli Defense Forces are not influenced by the party holding power and the feasible policy options are the same regardless of the ideology of the governing party.

³⁰Pape (2003) also stresses the importance of terrorists' strategies in an empirical study of all the suicide terrorist attacks worldwide from 1980 to 2001.

empirical predictions that are supported by the available data. Clearly, much further work remains to be done if we are to understand the connection between terrorism and electoral outcomes. It is our hope that a broader understanding of the dynamic interaction between terrorism and the political environment is a first step towards peaceful and just solutions to violent conflicts.

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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)

[illegible]

Table 3: Prais-Winsten Estimates for the Political Support Ration between Likud (right) and Labor (left) Parties (PSR_t)[†]

Political Support Ratio (Monthly Averages)				
Intercept	0.5398 ^{***} (0.0337)	0.5279 ^{***} (0.0295)	-0.1061 (0.2699)	-0.0559 (0.2773)
Deaths _t	0.0009 ^{**} (0.0004)	0.0012 ^{***} (0.0004)	0.0012 ^{***} (0.0004)	0.0011 ^{**} (0.0004)
Pollster Dummy		0.0940 ^{***} (0.0346)	0.0858 ^{**} (0.0349)	0.0836 ^{**} (0.0348)
Time Trend			0.0014 ^{**} (0.0006)	0.0012 ^{**} (0.0006)
No Left dummy (yes = 1)				0.0413 (0.0365)
Rho	0.9343	0.9182	0.8867	0.8907
Num. of Obs.	86	86	86	86
Adj. R-squared	0.6092	0.6634	0.7123	0.7099

[†] 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.

*** coefficient is significant at 1% level.

** coefficient is significant at 5% level.

* coefficient is significant at 10% level.

Table 4: Prais-Winsten Estimates for the Political Support Ration between Likud (right) and Labor (left) Parties (PSR_t) – Filtered Series[†]

Political Support Ratio (Monthly Averages)				
Intercept	0.5151*** (0.0479)	0.5105*** (0.0432)	0.0151 (0.3228)	0.0174 (0.3228)
Deaths _t	0.0007** (0.0003)	0.0008*** (0.0003)	0.0008*** (0.0003)	0.0008*** (0.0003)
Pollster Dummy		0.0475*** (0.0182)	0.0478*** (0.0184)	0.0479*** (0.0184)
Time Trend			0.0011 (0.0007)	0.0011 (0.0007)
No Left dummy (yes = 1)				0.0023 (0.0176)
Rho	0.9420	0.9364	0.9097	0.9091
Num. of Obs.	132	132	132	132
Adj. R-squared	0.1268	0.1700	0.2052	0.1998

[†] 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.

*** coefficient is significant at 1% level.

** coefficient is significant at 5% level.

* coefficient is significant at 10% level.

Table 5: Prais-Winsten Estimates for the Political Support Ration between Likud (right) and Labor (left) Parties (PSR_t) – Smoothed Series[†]

Political Support Ratio (Monthly Averages)				
Intercept	0.5209*** (0.0619)	0.5175*** (0.0579)	-0.0086 (0.3870)	-0.0071 (0.3863)
Deaths _t	0.0003 (0.0002)	0.0005** (0.0002)	0.0005** (0.0002)	0.0005** (0.0002)
Pollster Dummy		0.0380** (0.0150)	0.0382** (0.0151)	0.03821** (0.0151)
Time Trend			0.0012 (0.0008)	0.0012 (0.0008)
No Left dummy (yes = 1)				0.0030 (0.0147)
Rho	0.9651	0.9632	0.9451	0.9447
Num. of Obs.	132	132	132	132
Adj. R-squared	0.1012	0.1410	0.1778	0.1725

[†] 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.

*** coefficient is significant at 1% level.

** coefficient is significant at 5% level.

* coefficient is significant at 10% level.

Table 6: Likelihood Ratio Tests[†]

Primer Minister	Event Window	MLE	Joint MLE			
			With pre-MPC [*] MLE	LR	With Predecessor 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 led by Prime Minister Yitzhak Shamir preceded the one led by Peres. Shamir government's MLE is 0.5769.

Figure 1: Deaths from terrorist attacks

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.)