



Samuel Neaman Institute  
FOR ADVANCED STUDIES IN SCIENCE AND TECHNOLOGY



Technion  
Israel Institute of Technology

# ARE VOTERS SENSITIVE TO TERRORISM? DIRECT EVIDENCE FROM THE ISRAELI ELECTORATE

CLAUDE BERREBI • ESTEBAN F. KLOR

4

WORKING PAPER SERIES - ECONOMICS OF NATIONAL SECURITY

# ABOUT THE INSTITUTE

The Samuel Neaman Institute for Advanced Studies in Science and Technology is an independent public-policy research institute, established in 1978 to assist in the search for solutions to national problems in science and technology, education, economy and industry, and social development. As an interdisciplinary think-tank, the Institute draws on the faculty and staff of the Technion, on scientists from other institutions in Israel, and on specialists abroad. The Institute serves as a bridge between academia and decision makers in government, public institutions and industry, through research, workshops and publications.

The main emphasis in the professional activity of the Samuel Neaman Institute is in the interface between science, technology, economy and society. Therefore the natural location for the Institute is at the Technion, which is the leading technological university in Israel, covering all the areas of science and engineering. This multi-disciplinary research activity is more important today than ever before, since science and technology are the driving forces for growth and economic prosperity, and they have a significant influence on the quality of life and a variety of social aspects.

The Institute pursues a policy of inquiry and analysis designed to identify significant public policy problems, to determine possible courses of action to deal with the problems, and to evaluate the consequences of the identified courses of action.

As an independent not-for-profit research organization, the Institute does not advocate any specific policy or embrace any particular social philosophy. As befits a democratic society, the choices among policy alternatives are the prerogative and responsibility of the elected representatives of the citizenry. The Samuel Neaman Institute endeavors to contribute to a climate of informed choice.

The Institute undertakes sponsored research, organizes workshops and implements continuing education activities on topics of significance for the development of the State of Israel, and maintains a publications program for the dissemination of research and workshop findings. Specific topics for research may be initiated by the Institute, researchers, government agencies, foundations, industry or other concerned institutions. Each research program undertaken by the Institute is designed to be a significant scholarly study worthy of publication and public attention.

## Origins

The initiative for establishing this Institute in Israel was undertaken by Mr. Samuel Neaman. He nurtured the concept to fruition with an agreement signed in 1975 between himself, the Noon Foundation, the American Society for Technion, and Technion. It was ratified in 1978 by the Senate of the Technion. Mr. Neaman, a prominent U.S. businessman noted for his insightful managerial concepts and innovative thinking, as well as for his success in bringing struggling enterprises to positions of fiscal and marketing strength, devoted his time to the activities of the Institute, until he passed away in 2002.

## Organization

The Director of the Samuel Neaman Institute, appointed jointly by the President of the Technion and by the Chairman of the Institute Board, is responsible for formulating and coordinating policies, recommending projects and appointing staff. The current Director is Professor Nadav Liron. The Institute Board of directors is chaired by Prof. Zehev Tadmor. The Board is responsible for general supervision of the Institute, including overall policy, approval of research programs and overseeing financial affairs. An Advisory Council made up of members of the Technion Senate and distinguished public representatives, reviews research proposals and consults on program development.

# Are Voters Sensitive to Terrorism?

## Direct Evidence from the Israeli Electorate<sup>\*</sup>

Claude Berrebi<sup>†</sup> and Esteban F. Klor<sup>§</sup>

June 2007

**Abstract:** This paper relies on the variation of terror attacks across time and space as an instrument to identify the causal effects of terrorism on the preferences of the Israeli electorate. We find that the occurrence of a terror attack within three months of the elections is associated with a 1.35 percentage points increase on the local support for the right bloc of political parties out of the two blocs vote. This effect is of a significant political magnitude given the level of terrorism in Israel and the fact that its electorate is closely split between the right and left blocs. Moreover, a terror fatality has important electoral effects beyond the locality where the attack is perpetrated, and its electoral impact is stronger the closer to the elections it occurs. Interestingly, the observed political effects occur mainly on left-leaning localities and are not affected by the identity of the party holding office. Hence, terrorism does not cause the ideological polarization of the electorate. These results provide strong empirical support for the hypothesis that the electorate shows a highly sensitive reaction to terrorism.

---

<sup>\*</sup> We are grateful to Eli Berman, Haggai Etkes, Stian Ludvigsen, Tamir Sheafer and especially to M. Daniele Paserman for very helpful comments, suggestions and discussions. The article also benefited from the comments of audiences at seminars and conferences too many to mention. Yaron Aronshtam and Hernan Meller provided invaluable help in the construction of the data sets and Mike Tseng provided outstanding programming assistance with Geographic Information System (GIS). Esteban Klor thanks the Samuel Neeman Institute for financial support.

This document has not been subject to formal review by the RAND Corporation. The opinions and conclusions are solely those of the authors and do not necessarily represent the opinions or policy of the RAND Corporation or its research clients and sponsors.

<sup>†</sup> Rand Corporation, Santa Monica, California. E-mail: [ClaudeBerrebi@rand.org](mailto:ClaudeBerrebi@rand.org); <http://www.rand.org/methodology/econ/berrebi.html>

<sup>§</sup> Department of Economics, The Hebrew University of Jerusalem, Israel and Centre for Economic Policy Research. E-mail: [eklor@mscc.huji.ac.il](mailto:eklor@mscc.huji.ac.il); <http://economics.huji.ac.il/faculty/klor/klor.htm>

## 1. Introduction

It is by now well established that terror organizations have clearly stated ultimate objectives and a well devised strategy in the pursuit of those goals (Berman and Laitin, 2005; Kydd and Walter, 2006), to the point that they carefully assign terrorists to targets based on the terrorists and targets characteristics (Benmelech and Berrebi, 2007). We have also a good understanding of the economic determinants of terrorism (Bueno de Mesquita, 2005; Krueger and Maleckova, 2003).

Much less is known regarding the political characteristics of regimes targeted by terrorists. Pape (2003, 2005) argues, in a series of recent comprehensive studies of suicide terrorism, that terror organizations especially target liberal democracies because these regimes are more prone to make territorial concessions. This claim is based on the hypothesis that the electorate shows a highly sensitive reaction to terrorism. Since in a democratic regime the electorate may have the ability to influence state policy, voters may induce democratic leaders to make concessions to the terrorist factions.

Some scholars dispute that a clear correlation between political regime and terrorism exists. Whereas several studies show that democratic countries appear somewhat more likely to be the targets of terrorism (Krueger and Laitin, 2003; Piazza, 2006), other studies argue that the conclusions depend on the proxy used to measure political freedom (Jackson and Reiter, 2006). Finally, Abadie (2006) suggests that a non-monotonic relationship between terrorism and political regime exists, whereby countries in an intermediate range of political freedom are the ones particularly suffering from terrorism. All the studies above are based on cross national data sets. Hence, they cannot explore the basic underlying mechanism that induces democracies to grant concessions. In other words, these studies are not suitable to examine whether or not voters' sensitivity to terror attacks plays a role in any correlation that we might observe between terrorism and political freedom.<sup>1</sup> This is an important shortcoming since the sensitivity of the electorate to terror fatalities has yet to be clearly established and quantified.<sup>2</sup>

---

<sup>1</sup> A simple positive association between terrorism and political freedom would hardly be conclusive evidence that terror organizations exploit the electoral sensitivity of the electorate as hypothesized. An alternative hypothesis is that political freedom provides an easier environment in which terrorists can operate. It is crucial to differentiate between these two hypotheses because of their different policy implications.

<sup>2</sup> Recent studies empirically established a correlation between terrorism (or the threat thereof) and the electorate's political preferences. This correlation was documented using data from Israel (Berrebi and

This paper develops a specially designed econometric framework combined with a unique data set to carefully estimate the magnitude of the impact of terrorism on the electorate's preferences. We focus on the Israeli-Palestinian conflict and use the variation of terror attacks across time and space as an instrument to identify the causal electoral effects of terrorism. This approach helps us determine whether or not the sensitivity of the electorate to terrorism, i.e. the mechanism underlying the connection between political freedom and terrorism, is supported by the empirical evidence.

A fundamental problem that arises in any attempt to quantify the effect of terrorism on the electorate's preferences is that the estimates obtained may be biased due to a plausible interaction between the two variables: terror attacks may influence the electorate's preferences, but terrorism may also be a reaction to those preferences. This interaction precludes researchers from identifying the impact of terrorism from other shocks to the voters' preferences by using only the variation across time. That is, the observed correlation between terrorism and the electorate's preferences cannot be interpreted as a measure of the magnitude of the electoral effects of terrorism. Adding to the analysis the variation across space allows us to overcome the intrinsic difficulty of the task at hand. Note, however, that the variation across space would not be an appropriate instrument if terrorists condition the location of their attacks on the political preferences of the locality suffering the attack. In fact, such a strategy would imply that the causal relation is on the opposite direction. We use a falsification approach to dismiss this possibility.

Our results strongly support the assumption that the electorate is highly sensitive to terror fatalities. Notably, the occurrence of a terror attack within three months of the elections is associated with an increase of about 1.35 percentage points on the local support for the right bloc of political parties out of the two blocs vote. This effect is significantly stronger in localities that, on average, show a lower support for the right bloc of parties. The electoral effect of terror attacks is of an important political magnitude given the level of terrorism in Israel and the fact that its electorate is closely split between the right and left blocs. Moreover, the results show that a terror fatality has important electoral effects beyond the locality where the attack is perpetrated, and the electoral impact of terror attacks is stronger the closer to the

---

Klor, 2006; Fielding and Penny, 2006; Ludvigsen, 2005; Sheafer, 2004), Spain (Bali, 2005), and the U.S. (Davis and Silver, 2004; Guilmartin, 2004; Shambaugh and Josiger, 2004). All these studies focus exclusively on the variation over time of the variables of interest and use time series analysis to elucidate any connection between terrorism and electoral preferences.

elections they occur. Interestingly, the observed political effects are not affected by the identity of the party holding office.

At first glance our results seem paradoxical: Terror attacks cause an increase on the support for the right bloc of political parties, the bloc of parties that is associated with a more intransigent position toward terrorism and territorial concessions. In other words, terror attacks supposedly undermine the terror faction's goal. We disagree with this simplistic interpretation. Terror factions are complex organizations that tend to have a number of objectives (Kydd and Walter, 2007). Under some circumstances, these organizations face trade-offs between their main objectives, and a chosen strategy in pursuit of some of them may undermine the likelihood of achieving others.

There exist a number of alternative rational explanations behind terror campaigns. An interesting approach focuses on the impact of internal political considerations. For example, Bloom (2004, 2005) posits that terror attacks are a consequence of the internal political competition between Palestinian factions. This approach is consistent with the empirical evidence presented by Jaeger and Paserman (2006a) showing that terror factions indeed react to each other. Furthermore, extremists may perpetrate terror attacks with the goal to provoke the Israeli government into a forceful response against the Palestinian population. Accordingly, terrorists expect that a forceful Israeli retaliation radicalizes the population and increases the overall support for extremist factions (Bueno de Mesquita and Dickson, 2006; Jaeger and Paserman, 2006b; Siqueira and Sandler, 2006).

Other approaches focus more closely on the interaction between terrorism and political processes. Kydd and Walter (2002) argue that terror attacks are a consequence of extremist factions trying to sabotage peace processes. On the other hand, Bueno de Mesquita (2005) claims that terrorism increases after peace agreements because only moderates militants accept those agreements, leaving extremists militants in full charge of the terror campaign. Finally, Berrebi and Klor (2006) argue that terrorism is intended to impose a cost for the occupation on the Israeli voters and induce them to support territorial concessions. According to Berrebi and Klor's approach it is possible that, even if the electorate's support for the right bloc increases as a consequence of terror attacks, the political position of the right bloc (while still more hawkish than that of the left bloc) may be affected as well, and become less intransigent over time.

The theories just presented not only rationalize the behavior of terrorist factions but that of the Israeli electorate (or Israeli government) as well. Basically, these theories posit that the Israeli electorate does not perfectly know the actual division of power between the moderate and extremist factions. In this setup, a terror attack provides new information to the electorate. That is, terrorism tends to persuade the Israeli electorate that the moderate faction is unwilling or unable to stop terrorism and hence cannot be trusted. This rationalizes the overall increase on the support for the right bloc after terror attacks.

Alternatively, the behavior of the Israeli electorate can be explained by the theory of policy voting (Kiewiet, 1981). Accordingly, Israeli voters increase their support for the right bloc after the occurrence of terror attacks because they believe that this bloc places a higher emphasis on terror deterrence compared to the left bloc. We directly test the hypothesis that emanates from policy voting theory against the alternative theory of partisan voting. The results are consistent with the theory of policy voting. That is, voters increase their support for the right bloc after terror attacks because they believe that this bloc is more capable or willing to enact policies that are conducive to bring an immediate appeasement of the terror campaign.

The remainder of the paper proceeds as follows. The next section develops the econometric model used to estimate the effect of terrorism on the electorate's political preferences. Section 3 discusses our data and its sources and Section 4 presents our main results. Section 5 shows that the location of a terror attack is not chosen as a reaction to the political views of any particular locality's electorate. The last section concludes.

## 2. Empirical Strategy

This section describes our main empirical strategy used to identify the causal electoral effects of terrorism. This strategy is based on a difference-in-differences approach that uses the variation of terror fatalities across time and space in order to control for possible time or location specific effects.

Formally, the model we propose for the identification of the effect of terrorism on electoral outcomes can be specified as a fixed-effect linear regression model:

$$(Right\ Bloc\ Share)_{i,t} = \alpha(Terror\ Fatalities)_{i,t} + \beta(Total\ Fatalities)_t + \gamma X_{i,t} + \mu_i + \varepsilon_{i,t} \quad (1)$$

where  $(Right\ Bloc\ Share)_{i,t}$  is the right-bloc share of the two-blocs vote in locality  $i$  in elections  $t$ ;  $(Terror\ Fatalities)_{i,t}$  is the number of fatalities in locality  $i$  before the elections in  $t$ ;  $(Total\ Fatalities)_t$  is the total number of terror fatalities in Israel before elections  $t$ .  $X_{i,t}$  is a vector of political, socio-economic and demographic control variables that vary across localities and time. Finally,  $\mu_i$  is a fixed effect unique to locality  $i$ .

Note that the chosen econometric specification includes several variables that control for each locality's characteristics as well as a locality fixed effect. This is crucial since some of the locality's characteristics may be correlated simultaneously with higher terror fatalities and higher support for the right bloc. Thus, omitting them could lead to spurious statistical correlations.<sup>3</sup>

The proposed econometric specification is intended to identify the value of  $\alpha$ , the estimate of the local effect of terror fatalities on the voters' preferences. Since the model controls for the country-wide effect of terror fatalities, the parameter  $\alpha$  captures only the effect of terror fatalities in locality  $i$  on the preferences of voters living in this locality. For example, if the number of terror fatalities in locality  $i$  increases by one, the share of the right bloc from the two party vote in this locality changes by  $\alpha$ .

We expect  $\alpha$  to be positive according to some anecdotal evidence (*Yediot Aharonot*, January 10 2003) and a related theoretical analysis (Berrebi and Klor, 2006). We believe that we may observe a local effect of terror fatalities for a variety of reasons. First, a terror attack triggers residents of a locality to alter their daily routine as a consequence of a change in their perceived personal security, affecting their attitude toward peace (Gordon and Arian, 2001). Terror attacks may also affect the locality's economy and its residents' expected future income. These two effects may strongly antagonize the locality's residents and predispose them against any type of concessions to the Palestinian Authority. Second, the occurrence of a terror attack directly affects the salience of the conflict in the affected locality, and may affect the probability that its residents attach to a peaceful solution to the conflict differently than in the other localities. This effect is amplified by the coverage of the local media (Sheafer et al., 2007).<sup>4</sup> If, on the other hand, the estimate of the local effect of terror

---

<sup>3</sup> As noted by Bertrand et al. (2002), failing to account for serial correlation when computing standard errors may lead to over-rejection of the null hypothesis. We allow for correlated errors within localities over time by clustering all the regressions at the locality level.

<sup>4</sup> The information and salience effect of American soldiers killed in action was shown to affect local perceptions of the Vietnam war (Gartner et al., 1997) and the Iraq war (Karol and Miguel, 2007).



fatalities on the voters' preferences is negative, this would provide direct empirical evidence in support of Papes' conclusions even in the very short run. That is, a negative estimate for  $\alpha$  implies that terror attacks drive an immediate shift of the electorate in favor of granting concessions.

Another coefficient of interest is the one that measures the local electoral impact of terror attacks committed in other localities. The sign of this coefficient is a priori undetermined. If  $\beta$  is positive it might be because the policies proposed by parties in the right bloc won it new supporters after terror attacks. If this coefficient is negative we might conclude that national casualties from terrorism and voter disapproval of the chosen policy proposed by the right bloc led to an erosion of its support.

The model above is flexible enough to allow us to address other interesting questions regarding the electoral effect of terrorism. Most notably, we use the model to examine how the impact of terror fatalities varies according to the ideology of the political party holding office, and whether or not terrorism polarizes the electorate.

The next section presents a detailed description of the available data.

### **3. Data**

To implement our empirical framework we combined the necessary data on electoral outcomes and terror fatalities with data on demographic, economic and geographic indicators that are available at the locality level in Israel.

#### **3.a. Data on Electoral Outcomes**

Our main variable of interest is the vote share for the different political parties during the last five national parliamentary elections in Israel. The available electoral data, provided by the Central Bureau of Statistics (CBS), include the total number of eligible voters, voter turnout, and the support for each political party in the parliamentary elections of 1988, 1992, 1996, 1999 and 2003. All this information is available at the level of the polling station.

We aggregate the electoral data according to the municipal status of each geographical area, following the division of the country defined by the CBS. For the most part, each geographical area is defined by the presence of a single major city that holds administrative sway over the space of this area. These are classified as either municipalities or local councils. In other cases, several smaller villages are grouped together according to their location into a contiguous area called a regional council.

This paper's unit of interest consists of municipalities, local councils, and regional councils. The areas spanned by these three disjoint geographical units completely cover the Israeli territory.

The number of observations changes over time together with changes in the number of municipalities, local councils and regional councils. There were 953 disjoint geographical areas in 1988. Sixty-four of them were defined as municipalities, 106 were defined as local councils and the rest were grouped into 54 regional councils—this gives us 224 observations for the 1988's elections. In 2003 there were 1160 geographical areas divided into 70 municipalities, 117 local councils and 55 regional councils—that is, 242 localities.

To measure the political preferences of each locality's electorate we divide the political parties with representatives in the parliament into right-left bloc vote following closely the division set forth by Shamir and Arian (1999). Accordingly, the left bloc includes all the Arab parties, Meretz, Labor and Am Echad. The right bloc includes Likud, all the religious parties, all the nationalist parties (Tzomet, Moledet, National Union), and parties identified with Russians immigrants. All the centrist parties (the Center Party, the Third Way and Shinui) were not included in any of the blocs.<sup>5</sup>

We choose to divide the Parliament into right and left blocs to neutralize the effects that the different electoral systems in place may have had on the voters' strategies. Contrary to the other elections, the parliamentary elections of 1996 and 1999 allowed for split-ticket voting, whereby each voter cast a ballot in support of a political party for the parliamentary elections and a different ballot for the elections for Prime Minister. This different system may have had an effect on the relative support obtained by the different parties. Consequently, the results of these elections may not be directly comparable at the party level to the results of the parliamentary elections of 1988, 1992 and 2003. These concerns are no longer relevant when we divide the parliament into two main blocs.<sup>6</sup>

---

<sup>5</sup> As a robustness test, we conduct our econometric analysis for other specifications of the right bloc as well. The alternative specifications omit from the right bloc of parties the ultra orthodox Jewish parties and the Russians' parties. Although these parties were active members of every right wing government during the studied time period, they were members of the leftist governments of Yitzhak Rabin and Ehud Barak as well.

<sup>6</sup> All the regressions below include a dummy variable to account for any effects that split-ticket elections may have had on the voters' preferences. In addition to our focus on right and left blocs, the inclusion of the dummy variable helps us further neutralize the effects of the different voting systems.

### 3.b. Data on Terror Fatalities

We measure the level of terrorism using data on the number of noncombatant Israeli fatalities from terror attacks assembled by Berrebi (2003) and updated by Berrebi and Klor (2005). Specifically, the available data set on terror attacks contains daily information on each and every *fatal* terror attack against *noncombatants* that occurred on *Israeli soil* between July 13, 1984, the day of the elections for the 11<sup>th</sup> Israeli parliament, and June 30, 2004. 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*).

We assign each attack in the database to one of the localities, according to the geographic location of the attack, using Geographic Information System (GIS).<sup>7</sup> To the best of our knowledge, the combination of the political data set with the data set used by Berrebi and Lakdawalla (2007) comprises the most accurate and comprehensive unclassified data set that exists on fatal terror attacks against noncombatants on Israeli soil since 1984.<sup>8</sup>

The geographical distribution of terror attacks during the time period of interest appears in Figure 1. This figure also provides the partition of Israel into localities in effect in 2004. The figure shows that, despite the higher concentration of attacks in certain areas, there is still enough geographical variability across localities to conduct a meaningful econometric estimation.

[Figure 1 about here]

We calculate for each locality its mean relative support for the right bloc of parties over the five parliamentary elections at issue. This measure provides a glimpse of the localities' electorate preferences. Figure 2 depicts the distribution of the localities' mean relative support for the right bloc. An interesting pattern that emerges from this figure is the extant heterogeneity of the localities' preferences. Besides an apparent bunching of localities with a low relative support for the right bloc, the rest

---

<sup>7</sup> Berrebi and Lakdawalla (2007) provide a detailed explanation of this matching.

<sup>8</sup> Our data set on terrorist attacks dates back to 1949. We start our empirical analysis after the elections of 1984 because the electoral data is available only for the elections of 1988 onwards.

of the range shows a distribution close to uniform, with localities spanning the entire range.

[Figure 2 about here]

Table 1 presents summary statistics for the variables described above. The table distinguishes between localities that suffered at least one terror fatality between two consecutive elections and the rest.

[Table 1 about here]

This table exhibits some extent of a patterned difference in terms of the support for the right bloc of parties between localities that were attacked and the rest. Namely, localities that suffered at least one terror fatality before the elections show a larger support for the right bloc than the rest of the localities. The difference in the mean share of the vote for the right bloc varies from almost four percentage points in the 1988 elections (before terrorism became a major issue dimension for Israeli voters) to over 26 percentage points in the 1999 elections. These patterns of support do not change qualitatively when we restrict our attention to localities that were not occupied by Israel in 1967.

Regarding the frequency of terror fatalities, the table illustrates the great variation observed on terror attacks over time. Although terrorism is not a new phenomenon in Israel, the number of terror fatalities was relatively low before the elections of 1988. There is an important increase in the frequency of terrorist attacks up to the elections of 1996, and a step decrease afterwards until the eruption of the second Palestinian uprising in September 2000. The significant increase in the number of terror fatalities before the elections of 2003 reflects the widespread use of terrorism by several Palestinian factions during the first three years of the second uprising.

The marked fluctuations on the number of terror fatalities for the entire period between every two consecutive elections pale, percentage wise, compared to the fluctuations on the number of terror fatalities during shorter periods preceding the elections. For example, a comparison for the elections of 1996 to the elections of 1992 reveals that the number of fatalities in the year leading to the elections increased by almost 450 percent whereas the number of fatalities for the entire period increased by

less than 250 percent. The same pattern obtains for the rest of the elections. It is worth noting that comparing the elections of 1999 and 2003 the number of fatalities for the entire period increased tenfold whereas the number of fatalities during the year that preceded the elections increase by over 40 times.

An analysis of the severity of the terror campaign before the elections has to take into account some particularities of the Israeli electoral system. The Israeli system is based on a parliamentary democracy with elections that are supposed to take place every four years. The parliament, however, may decide by an ordinary majority to dissolve itself and call for unscheduled early elections.<sup>9</sup> This means that the timing of elections is endogenous to the political environment. In fact, except for the elections of 1988, all other Knesset elections during the period at issue preceded their original scheduled dates. In 1992, 1996, and 1999 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.

Since the timing of the elections in Israel is not entirely predetermined, the terror campaign may not be geared to affect the political preferences of the electorate but a consequence thereof. Simply put, terrorists may use terror attacks to topple a government that seems unstable and they dislike. On the contrary, terrorists may refrain from attacks to help a government of their liking to remain in power. As a consequence, we cannot conclude that there is a casual relation between terrorism and political preferences solely on the basis of the extant correlation between these two variables over time. Thus, it is crucial for identification purposes to add to the analysis the spatial variation of these two variables.

### **3.c Other Variables of Interest**

To estimate the model as specified above we incorporate into the analysis additional political, socio-economic and demographic variables.

The analysis includes the locality's size, its distance to the closest terrorist home base (see Figure 1 for the exact location of home bases during the period at issue), and

---

<sup>9</sup> During the parliamentary elections of 1996 and 1999 the electoral system included 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. When this system was in place (until the elections of 2003) 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.

dummy variables for localities that serve as regional capitals and localities that have an international border. These variables, fixed over time, were obtained from Berrebi and Lackdawalla (2007) and were all measured in 2004.<sup>10</sup> Additionally, we collected from the CBS data on the yearly average wage and net migration for each locality. These variables are only available for the years 1995 onwards. For the purposes of this paper we focus on these variables during the year prior to the elections; that is, 1995, 1998 and 2002. We normalize the average wage using the consumer price index with 2002 as the base year.<sup>11</sup> Net migration is defined as the total number of citizens that moved to a locality (including new immigrants) minus the total number of citizens that left the locality in a given year. We normalize this variable by the locality's total population.

Summary statistics describing these variables appear in Table 2.

[Table 2 about here]

Table 2 presents an intuitive picture concerning the correlation between terror fatalities and the control variables of interest. As expected, we observe that on average terror attacks occur in localities that are closer to the terrorist factions' home bases, more established localities (in the sense that they function as regional capitals), and wealthier localities. There seems to be no clear correlation between having an international border or the size of the locality and terror fatalities. Additionally, citizens do not overwhelmingly move away from localities that tend to suffer from terrorism.

#### **4. The Effect of Terror Fatalities on the Preferences of the Electorate**

##### **4.a Benchmark Specification**

Table 3 presents the estimation of the effects of terror fatalities on the preferences of the electorate as specified in model (1). Column 1 reports the results of a specification

---

<sup>10</sup> Berrebi and Lakdawalla (2007) determine the location of a home base of a terror faction at a given time based on several sources. Basically, a location is considered to be a home base for a terror faction at a specific time if one of their sources (either a news outlet or an institute specializing in the study of terrorism) determined after an attack that this location was used for bomb-making, training, and/or preparations. See Berrebi and Lakdawalla (2007) for a more detailed explanation of these variables.

<sup>11</sup> The average wage at the locality level is not available for all the localities during the time period of interest. In particular, there are 35 missing values for 1996, 13 missing values for 1999 and 9 missing values for 2003.

using the whole sample and including no covariates except for localities fixed effects. We find that the occurrence of a terror fatality within three months of the elections is associated with a 0.45 percentage points increase in the locality's relative electoral support for the right bloc of political parties. This effect is not only highly statistically significant but is also of a significant political magnitude. A terror attack causes, on average, almost three fatalities during the time period at issue. Thus, one terror attack causes roughly an increase of 1.35 percentage points in the relative support for the right bloc. Given that the Israeli electorate is closely split between the right and left blocs, the occurrence of a terror attack before an election (or the lack thereof) can clearly determine the electoral outcome. In particular, the localities' average relative support for the right bloc on the elections during the time period at issue is in the order of 47 percent. Thus, an increase by two on the average number of attacks would be almost enough to decide the elections in favor of the right bloc of political parties in an average locality.

[Table 3 about here]

A terror fatality has important electorate effects beyond the locality where it is perpetrated. Column 2 presents the full effect of a terror fatality, both in the locality where the attack was perpetrated and its repercussions in the other localities. Once we control for the effect of the fatality on other localities the local effect is in the order of 0.23 percentage points. On top of that effect, a terror fatality within three months of the elections causes an increase of 0.06 percentage points on the relative support for the right bloc in each of the rest of the localities.

One concern is that there may be characteristics of a locality that vary across time and space and that are correlated with the occurrence of a terror attack and the support for the right bloc.<sup>12</sup> For example, it could be that the distance of a locality to the home base of a terrorist faction, or the importance of the locality as measured by whether it acts as a regional capital, may determine the political preferences of its inhabitants and the likelihood of a terrorist attack. Therefore, in Columns 3 and 4 we directly control for a number of observed characteristics of the localities.

---

<sup>12</sup> The next section provides evidence consistent with the notion that terror attacks are driven by fixed characteristics and not by the observed time-varying variables. This suggests that terror attacks are also less likely to be correlated with time-varying locality-specific unobserved shocks.

Column 3 controls for characteristics that vary across space but are constant over time.<sup>13</sup> This column shows that the magnitude of the effect of a terror fatality does not change when the localities' characteristics are taken into account. The effect of the other covariates is intuitive. The electoral support for the right bloc decreases with the distance of the locality to the terror factions' home bases and the distance to international borders. The support for the right bloc increases in regional capitals. According to the estimation's results, the size of the locality and the Jerusalem dummy do not affect the preferences of the electorate.

Column 4 adds to the econometric model variables that vary across space and time. In addition to all the covariates used in Column 3, the specification in Column 4 includes each locality's standard deviation from the national average wage measured separately for every year considered in the analysis, and each locality's net migration share of its total population.<sup>14</sup> Since these two variables are available at the locality level only from 1995 onwards, we restrict our estimation to the elections of 1996, 1999 and 2003 when they are included as covariates. The inclusion of the average wage at the locality level helps us control for possible effects of economic conditions on the relative support for the right-wing party, as predicted by the economic voter hypothesis. [See Lewis-Beck and Stegmaier (2000) for a thorough review of this literature.] The inclusion of the net migration share of the population is meant to control for the Tiebout hypothesis, whereby voters sort themselves out between the different localities according to their preferences. That is, our results could be a consequence of left-wing voters migrating from localities that tend to suffer from terrorism to localities that tend not to suffer from terror attacks, without any voter actually changing her preferences. Adding the net migration share of each locality's population as a covariate allows us to differentiate the Tiebout hypothesis from the hypothesis stating that voters change their preferences.

The results show that the average wage's standard deviation has a statistically significant positive impact on the electorate's preferences. Quantitatively, we obtain that a one-standard deviation increase of a locality's average wage increases the

---

<sup>13</sup> Covariates that are time invariant are perfectly correlated with the localities fixed effects. Therefore, we do not include fixed effects into the econometric model whenever we estimate a model that contains these covariates.

<sup>14</sup> Formally, the standard deviation from the national average wage for a locality  $i$  whose average wage rate at time  $t$  is  $w_{it}$  is defined as  $(w_{it} - w_t)/\sigma_t$ , where  $w_t$  is the national average wage and  $\sigma_t$  is its standard deviation, both measured at time  $t$ . This specification of the wage rate delivers a coefficient that is unit free without affecting its significance level.



support for the right bloc by slightly over 2 percentage points. Note that a one-standard deviation is roughly equivalent to a third of the average wage. Hence, the effect of this variable is so small that the results support the prevailing view that states that the security-peace dimension is by far the most influential dimension for Israeli voters (Shamir and Arian, 1999; Sheaffer, 2004). Contrary to the average wage, net migration does not significantly affect the preferences of the electorate or the electoral impact of terror fatalities. This establishes that the electoral effect of terror fatalities is not driven by voters changing their locality of residence. Rather, it is caused by voters changing their preferences.

Columns 5 to 8 in the table repeat the same empirical exercise excluding from the data sample the set of localities in territories that Israel occupied after the war in 1967. This is an important robustness test since the territories occupied in 1967 are characterized by higher levels of terror fatalities and an electorate that shows a higher support for the right bloc.<sup>15</sup> Therefore, their inclusion may lead us to observe a confounding correlation between the two variables of interest.

Columns 5 to 8 make it evident that restricting the sample does not qualitatively affect the results. Although we observe a slight decrease in the political effects of terror fatalities, both locally and nationally, this decrease is not of a significant magnitude. That is, the positive effect of terror fatalities on the relative support for the right bloc of parties is maintained in this restricted sample of localities.

Contrary to the effects of terror fatalities, the effects of some of the other covariates are significantly affected by the exclusion of localities occupied in 1967. The negative effect of the distance to the terrorist factions' home bases and of having an international border completely disappears in the restricted sample. Naturally, localities in territories occupied in 1967 are closer to terrorists' home bases (which are located either in limiting countries or in the occupied territories) and are less likely to have an international border. In these particular localities we observe a relatively higher support for the right bloc of parties, and thus the correlation between these three variables. The fact that this correlation ceases to exist in the restricted sample shows that the connection between the relative support for the right bloc of parties and these two variables, i.e. distance to home bases and international border, is not causal

---

<sup>15</sup> During the studied time period, localities in territories occupied in 1967 suffered, on average, over 1.5 fatalities between two consecutive elections. These localities showed, on average, a relative support for the right bloc equal to 0.84. The average number of fatalities between two consecutive elections for the rest of the localities is 0.69. These localities average relative support for the right bloc is 0.43.

in nature. Note that the remaining covariates were not qualitatively affected by the exclusion of the localities occupied in 1967.

#### **4.b An Analysis of Policy versus Partisan Voting**

Our econometric estimation, so far, implicitly assumed that the political effect of a terror fatality is the same for all the prime ministers holding office during the period at issue. This view is in accordance with the policy voting hypothesis. Accordingly, parties benefit from the salience of issues to which they are generally viewed as attaching highest priority (Kiewiet, 1981). This hypothesis implies that the Israeli electorate increases its support for the right bloc of political parties after a terror attack because this bloc is identified with a higher emphasis on terrorism deterrence. In other words, since the right bloc has a policy that places more weight on security related issues, terror attacks during the tenure of a prime minister from the right bloc may be perceived as inevitable, whereas terror attacks during the tenure of a prime minister from the left bloc may be perceived as preventable by using stronger deterrence policies.

On the contrary, the partisan theory of voting predicts the opposite effect. Accordingly, parties are evaluated most heavily in terms of their performance on the issues to which they attach a high priority (Powell and Whitten, 1993). Therefore, repeated terror attacks may cause a decrease on the support for the right bloc under a rightist incumbent, and may not have a significant effect on the electorate's preferences under a leftist incumbent. We test these two alternative approaches in Table 4.

[Table 4 about here]

As shown in the table for the full and restricted sample, respectively, the electoral effect of a terror fatality is not affected by the identity of the party holding office. Although there is evidence of a significant incumbency effect on the relative support for the right bloc of parties, the electoral impact of terror fatalities does not depend on whether or not the prime minister at the time of the attacks belongs to the right bloc. Hence, the empirical evidence supports the policy voting hypothesis, whereby terror attacks cause an increase on the support for the right bloc regardless of the political affiliation of the incumbent prime minister.

#### **4.c Does Terrorism Polarize the Electorate?**

The previous subsections focused on the entire electorate to establish the direct effects of terrorism on voters' preferences. This subsection focuses on sub-samples of localities, grouped according to their political preferences, to analyze the extent to which left and right leaning localities exhibit a similar reaction to terror fatalities.

To the best of our knowledge, there is not a clear theoretical prediction regarding the effects of terrorism on the ideological polarization of the electorate. It is nevertheless important to empirically explore this issue given the vast ramifications that polarization has on a country's political system. As argued in Sartori's (1976) seminal work, polarization causes centrifugal pressure that shifts away the support for centrist parties and inhibits the formation of stable parliamentary majorities. This directly leads to fragmentation and destabilization of democratic regimes. Additionally, the polarization of the population is likely to cause social conflict as well as marked fluctuations of public policies, thus undermining the country's political and economic performance. Consequently, if indeed terrorism causes the polarization of the population, it follows that terrorism does not simply bring an overall increase on the support for the right bloc but, in fact, has important structural political, social and economic effects.

To test whether terrorism polarizes the electorate we take advantage of the heterogeneity of the localities' preferences shown in Figure 2, and estimate the regression model that appears in Column (3) of Table 3 for sub-samples of the localities. These sub-samples are determined according to the localities' mean relative support for the right bloc over the elections during the time period at issue. The results of the estimations appear in Table 5.<sup>16</sup>

[Table 5 about here]

Interestingly, terror fatalities do not move left-leaning localities further to the left and right-leaning localities further to the right. Rather, the effect of terror fatalities on the relative support for the right bloc gradually increases the more left-leaning the

---

<sup>16</sup> The coefficients for the other covariates are not reported to simplify the exposition. These estimates are very similar to the ones reported in Table 3. The complete results are available from the authors upon request.

localities are. Whereas the local effect of terror fatalities in localities with a mean support for the right bloc below 0.5 is almost double the one observed for all the localities, this effect increases more than tenfold in localities with a mean support for the right bloc of parties below 0.2. On the contrary, terror fatalities do not have a significant effect on right-leaning localities.

The estimate for total terror fatalities in Israel is almost the mirror image of that for local terror fatalities. The support for the right bloc of parties in left-leaning localities shows a significant decrease with terror fatalities elsewhere, but it significantly increases in right-leaning localities. It seems, therefore, that total fatalities tend to polarize the electorate. We obtain the same qualitatively conclusions when we exclude from our sample localities in territories occupied in 1967.

Summarizing, the empirical evidence does not provide clear support for the hypothesis that terrorism causes an ideological polarization of the electorate. In fact, according to the magnitudes of the coefficients, among localities with a mean relative support for the right bloc below 0.4, a local terror fatality increases the support for the right bloc by 0.025 percentage points whereas a terror fatality elsewhere decreases the support for the right bloc by 0.0008 percentage points. Hence, only those localities that suffered less than one local terror fatality for every 31 total fatalities decrease their support for the right bloc of parties. On the contrary, all other localities increase their support for the right bloc of parties. Similar results are obtained when we base our conclusions on the regressions for localities with a different mean relative support for the right bloc.

#### **4.d Robustness Tests**

This subsection presents two robustness tests performed to the main results presented in Table 3. First, we show that alternative divisions of the electorate into right and left blocs do not affect the estimated impact of terrorism on voters' preferences. Secondly, we observe a similar electoral effect of terror fatalities when these fatalities are measured in different time spans.

Table 6 studies the effects of terrorism on two different definitions of the right bloc of parties. These definitions alternatively exclude from the right bloc the parties that represent the Russians immigrants and the ultra orthodox Jews. These parties,

even though identified with the right bloc, at times joined coalitional governments lead by the Labor party.

[Table 6 about here]

The table shows that the results are robust to these alternative definitions. In fact, we observe an important increase in the local effect of terror fatalities when we exclude the ultra-orthodox parties from the analysis. To understand this increase, note that supporters of the ultra orthodox parties are extremely unlikely to vote for a different party. Hence, excluding these voters from the analysis simply increases the sensitivity of the effect of terrorism, as we focus now only on voters that are more likely to shift alliances between the two blocs.<sup>17</sup>

Our second robustness test uses different time spans to measure terror fatalities. The estimations so far took into account only terror fatalities within three months of the elections. This choice seems arbitrary and leaves out of the analysis important information. Table 7 extends the analysis to alternative time spans. That is, the different estimations presented on this table study the effect of the timing of the terror fatalities on the preferences of the electorate. The first column shows the effects of terror fatalities that occurred within three months of the elections and every subsequent column includes into the analysis terror fatalities that occurred farther away from the elections.<sup>18</sup>

[Table 7 about here]

The results of this exercise are conclusive: the electoral impact of terror fatalities does not qualitatively change for the different time spans used to measure terror fatalities. Quantitatively, there is a decrease on the electoral impact of terrorism the farther away the fatality occurs from the elections. The gradual decrease of the effect occurs both at the local and national level. At the local level, we observe that a terror fatality more than a year before the elections loses half of its electoral impact

---

<sup>17</sup> All the estimations presented in the paper were also performed for the alternative definitions of right bloc. We do not report these results because they are very similar to the ones reported in the text. They are, of course, available from the authors upon request.

<sup>18</sup> Columns 1 and 5 in the table simply reproduce the evidence presented in Columns 3 and 7 of Table 3, respectively. Consistently with Table 3, Columns 1 to 4 in Table 7 provide evidence for the entire sample of localities whereas Columns 5 to 8 exclude localities in territories occupied in 1967.

on the electorate's preferences. Interestingly, the decrease is more pronounced at the national level where the terror attack is not as salient for the voters. For example, a terror fatality over a year before the elections loses over 85 percent of its impact on an average locality that did not suffer directly the attack. Almost identical conclusions are reached in Columns 5 to 8 with a restricted sample that excludes localities occupied in 1967.

These results are consistent with several theoretical models that posit that not only terror fatalities convey messages that may affect the preferences of the electorate, but also the lack of terror attacks should, in principle, have an effect on the voters' beliefs and preferences (Kydd and Walter, 2002; Bueno de Mesquita, 2005; Berrebi and Klor, 2006). Accordingly, we should expect that terror fatalities have a stronger electoral impact the closer to the elections they occur. Unfortunately, we are not able to directly test this hypothesis because terror fatalities at the locality level are strongly correlated over time. Therefore, it is not possible to separate the individual effects of terror fatalities measured over different time spans when included on the same regression model.

### **5. Testing for Reverse Causality: Do Political Preferences Influence the Location of Terror Attacks?**

A major methodological concern regarding our identification strategy is that terrorists may choose the location of their attacks strategically, and that this choice may not be orthogonal to the political preferences of the localities' electorate. To dissipate this concern we need to establish that, even if the political preferences of the Israeli electorate may affect the terror organizations' decision on whether or not to perpetrate an attack, the location of the attack is not chosen as a reaction to the political views of any particular locality's electorate. This section uses a falsification exercise to provide evidence in support of the assumption behind our identification strategy.

Our analysis adds to Berrebi and Lakdawalla (2007) the political preferences of the Israeli electorate at the locality level. Berrebi and Lakdawalla study the determinants of terrorism's risk in Israel. They assess the success of different factors on explaining the location of terror attacks using data on the location and the timing of terror attacks in Israel from 1949 to the present. Their econometric analysis focuses on six covariates, all measured in 2004: the locality's population, size, percent of Jewish population, distance to the closest terrorist home base, whether the locality

serves as a regional capital, and whether it has an international border. They also add a Jerusalem dummy to account for the unique position of this city as an attractive and accessible target of terrorism.

This section replicates their econometric estimation using the same data set but including the vote share for the right-bloc of parties as an additional covariate. Formally, the adopted econometric specification is

$$(Terror\ Fatalities)_i = \alpha + \beta(Right\ Bloc\ Share)_i + \gamma X_i + \nu_i \quad (2)$$

where  $(Terror\ Fatalities)_i$  is the number of fatalities in locality  $i$  between every two successive elections;  $(Right\ Bloc\ Share)_i$  denotes the share of the two-bloc vote in support of the right bloc in locality  $i$ ; and  $X_i$  is the vector of covariates used by Berrebi and Lakdawalla (2007). Namely,  $X_i$  includes locality's  $i$  population; its size (in square kilometers); the percent of Jews in the local population; the distance between locality  $i$  and the closest terrorist home base; and three dummy variables: one for Jerusalem, the second one for localities that have an international border, and the last one for localities that serve as a regional capital.<sup>19</sup>

We estimate the equation above for every election during the time period at issue. Table 8 presents the results of the estimation.<sup>20</sup> Each column in this table presents the estimated coefficients from a separate Poisson regression for each election. For example, the column entitled 1988 presents the results of the regression above based on terror fatalities between the parliamentary elections on November 1, 1988 and the parliamentary elections on June 23, 1992, combined with the electoral results of the 1988 elections.<sup>21</sup> The respective cells in that table contain the estimated coefficients with their corresponding robust  $t$ -statistics (in parenthesis) and elasticities (in brackets).<sup>22</sup>

[Table 8 about here]

---

<sup>19</sup> A similar falsification approach was used by Karol and Miguel (2006) in their study of the impact of Iraq war casualties on the political preferences of American voters.

<sup>20</sup> The coefficients for the constant term as well as the vector of covariates used by Berrebi and Lakdawalla (2007) are not reported to simplify the exposition.

<sup>21</sup> Note that our data set includes terror fatalities only until June 2004. Hence, the estimation for the elections of 2003 is based on terror fatalities up until that date and not until the elections of 2006.

<sup>22</sup> The elasticities are calculated around the means of the independent variables.

The results show that there is not a significant relationship between a locality's terror fatalities after an election and the locality's share of the vote for the right bloc. For all the regressions the  $t$ -statistics are well below 2, indicating that essentially we can not statistically reject the hypothesis that there is no correlation between these two variables. These results are consistent with the main logic behind the Israeli electoral system. This system is characterized by nationwide proportional representation. That is, every vote has the same electoral power, regardless of the voters' location or the preferences of the localities' electorate. Consequently, except for the message that terror attacks may potentially send to the electorate, there is not an electoral incentive to choose the location of the attacks based on the localities' preferences.

Panel B of Table 8 presents the results of the same estimation but excluding from our data sample localities in territories occupied by Israel in 1967. As expected, the results are even more conclusive than the ones observed using the full sample. Not only are most of the coefficients for the share of the vote for the right bloc statistically insignificant, but additionally a majority of these coefficients are even negative.

The other covariates included in the regressions are consistent with the results of Berrebi and Lakdawalla (2007). The main determinants of the location of a terror attack are whether the locality serves as a regional capital, the locality's population, and its percent of Jews.<sup>23</sup>

One final comment is due on the effect of the distance to terror factions' home bases on the number of terror fatalities. Whereas this covariate has a significant negative effect on the number of terror fatalities for the elections of 1988, 1992 and 1999, its effect for the elections of 2003 is not only positive but highly statistically significant.<sup>24</sup> We conjecture that this striking change on the effect of this covariate is due partly to the construction of the separation fence between several localities under the rule of the Palestinian Authority and localities in Israel. In its first phase, the fence was built around Palestinian localities housing home bases of terror factions. We believe that as a consequence of this additional obstacle terror factions began to send their operatives into Israeli territory to commit attacks not directly from their home bases, but from more accessible locations. Thus, not only the strong positive connection between a locality's closeness to a terror home base and terror fatalities

---

<sup>23</sup> The exact estimates for these covariates can be obtained from the authors upon request.

<sup>24</sup> The robust  $t$ -statistics for this covariate using the entire sample are -1.04 (for the elections of 1988), -2.59 (for 1992), -0.6 (for 1996), -2.11 (for 1999) and 2.15 for the elections of 2003. Similar results are obtained using the restricted sample.



ceased to exist, but it even becomes negative as the fence shifted terror attacks to localities further away from these home bases.<sup>25</sup>

To sum up, the results of this section confirm the crucial assumption of the proposed identification strategy. Namely, the political preferences of a locality's electorate does not seem to affect the number of terror fatalities suffered by this locality once we control for other factors that influence the location of a terror attack.

## 6. Conclusions

This paper documented that terrorism has a strong effect on the political preferences of the electorate. We have shown that the occurrence of a terror attack causes an increase in the order of 1.35 percentage points on the relative electoral support for the right bloc of political parties. This effect is significantly higher in localities with lower support for the right bloc of political parties. Consequently terrorism does not cause the ideological polarization of the electorate. Moreover, the results show that a terror fatality has important electoral effects beyond the locality where the attack is perpetrated, and the electoral impact of terror attacks is stronger the closer to the elections they are perpetrated. Finally, the observed political effects are not affected by the identity of the party holding office.

We focused on the Israeli-Palestinian conflict as the case study of interest for several reasons. First, terrorism is one of Israel's most salient issues. Over five hundred terror attacks resulted in more than a thousand and two hundred Israeli fatalities since July 1984, the date of the elections for the 11<sup>th</sup> Israeli Parliament. This provided us with enough observations to be able to conduct a rigorous empirical analysis. Furthermore, the political positions of the Israeli political parties regarding terrorism and the occupation are fairly well known to voters and terrorists alike, allowing us to provide a clear interpretation of our results.

The particularities of the Israeli case notwithstanding, the revealed empirical evidence on the consequences of terror fatalities may describe similar patterns elsewhere. This case study may teach us general lessons based on over fifty years of dealing with terrorism. These lessons show that terror attacks affect the electorate, substantiating the hypothesis that democracies are especially susceptible to be

---

<sup>25</sup> We refer to this effect as the spatial substitution effect of the separation fence. This effect is similar to the substitution effect of other antiterrorism policies that cause terror organizations to shift between different attacks modes (Enders and Sandler, 1993).

targeted by terror organizations. Democratic governments should take note of these political implications of terrorism when they devise counter-terrorism policies. In general, the implementation of counter-terrorism policies is accompanied by an increase on the salience of terrorism, due partly to public statements made by policy makers. Our results imply that an increase in the salience of terrorism as an important issue dimension has a negative effect that may encourage terrorists to intensify their campaign. On the contrary, policies that diminish the electorate's sensitivity to terrorism may be very efficient in lowering its threat as well.

In addition to estimating the electoral effects of terrorism, this paper provided a contribution to the existing literature studying the causes and consequences of terrorism. The proposed approach showed that it is crucial to take into account spatial and temporal variability in the level of terrorism to be able to identify its effects. Hopefully, researchers will use the proposed methodology to further our understanding of terror organizations' modus operandi.

#### **References:**

Abadie, Alberto. 2006. "Poverty, Political Freedom and the Roots of Terrorism," *American Economic Review* 96 (2): 50-56.

Bali, Valentina A. 2005. "Terror and Elections: Lessons from Spain." Unpublished manuscript, Michigan State University.

Benmelech, Efraim and Berrebi, Claude. 2007. "Human Capital and the Productivity of Suicide Bombers," *Journal of Economic Perspectives*, forthcoming.

Berman, Eli and Laitin, David D. 2005. "Hard Targets: Evidence on the Tactical Use of Suicide Attacks," Working Paper 11740, National Bureau of Economic Research.

Berrebi, Claude. 2003. "Evidence about the Link between Education, Poverty and Terrorism among Palestinians." IRS Working Paper 477, Princeton University.

Berrebi, Claude and Klor, Esteban F. 2005. "The Impact of Terrorism Across Industries: An Empirical Study," Discussion Paper 5360, Centre for Economic Policy Research.

Berrebi, Claude and Klor, Esteban F. 2006. "On Terrorism and Electoral Outcomes: Theory and Evidence from the Israeli-Palestinian Conflict," *Journal of Conflict Resolution*, 50(6): 899-925.

Berrebi, Claude and Lakdawalla, Darius. 2007. "How Does Terrorism Risk Vary Across Space and Time? An Analysis Based on the Israeli Experience," *Defense and Peace Economics*, 18(2): 113-131.

Bertrand, Marianne, Duflo, Esther and Mullainathan, Sendhil. 2004. "How Much Should We Trust Difference-in-Differences Estimates?" *The Quarterly Journal of Economics*, 119(1): 249-275.

Bloom, Mia. 2004. "Palestinian Suicide Bombing: Public Support, Market Share, and Outbidding," *Political Science Quarterly*, 119(1): 61-88.

Bloom, Mia. 2005. *Dying to Kill: The Allure of Suicide Terrorism*. New York: Columbia University Press.

Bueno de Mesquita, Ethan. 2005. "Conciliation, Counterterrorism and Patterns of Terrorist Violence," *International Organization*, 59 (1): 145-176.

Bueno de Mesquita, Ethan. 2005. "The Quality of Terror," *American Journal of Political Science*, 49(3): 515-530.

Bueno de Mesquita, Ethan and Dickson, Eric. 2006. "The Propaganda of the Deed: Terrorism, Counterterrorism and Mobilization," *American Journal of Political Science*, 51(2): forthcoming.

Davis, Darren W. and Silver, Brian D. 2004. "The Threat of Terrorism, Presidential Approval, and the 2004 Election," unpublished manuscript, Michigan State University.

Enders, Walter and Sandler, Todd. 1993. "The Effectiveness of Antiterrorism Policies: A Vector Autoregression Intervention Analysis," *American Political Science Review*, 87(4): 829-844.

Fielding, David and Penny, Madeline. 2006. "What Causes Changes in Opinion about the Israeli-Palestinian Peace Process?" Economics Discussion Papers No. 0601, University of Otago.

Gartner, Scott Sigmund, Segura, Gary M. and Wilkening, Michael. 1997. "All Politics are Local: Local Losses and Individual Attitudes toward the Vietnam War," *Journal of Conflict Resolution*, 41(5): 669-694.

Gordon, Carol and Arian, Asher. 2001. "Threat and Decision Making," *Journal of Conflict Resolution*, 45(2): 196-215.

Guilmartin, Eugenia. 2004. "Terrorist Attacks and Presidential Approval from 1949-2002," unpublished manuscript, United States Military Academy.

How Many Parliament Seats is a Terrorist Attack Worth? 2003. *Yediot Aharonot*, January 10.

Jackson, Sara E. and Reiter, Dan. 2006. "Does Democracy Matter? Regime Type and Suicide Terrorism," Unpublished manuscript, Emory University.

Jaeger, David A. and Paserman, M. Daniele. 2006a. "Israel, the Palestinian Factions, and the Cycle of Violence," *American Economic Review* 96 (2): 45-49.

Jaeger, David A. and Paserman, M. Daniele. 2006b. "The Cycle of Violence? An Empirical Analysis of Fatalities in the Palestinian-Israeli Conflict?" Unpublished manuscript, The Hebrew University of Jerusalem.

Karol, David and Miguel, Edward. 2007. "Iraq War Casualties and the 2004 U.S. Presidential Election," *Journal of Politics*, forthcoming.

Kiewiet, D. Roderick. 1981. "Policy-Oriented Voting in Response to Economic Issues," *American Political Science Review* 75 (2): 448-459.

Krueger, Alan B. and Laitin, David D. 2003. "Kto Kogo?: A Cross-Country Study of the Origins and Targets of Terrorism," Unpublished manuscript, Princeton University.

Kydd, Andrew, and Walter, Barbara F. 2002. "Sabotaging the Peace: The Politics of Extremist Violence," *International Organization*, 56 (2): 263-96.

Kydd, Andrew H. and Walter, Barbara F. 2006. "The Strategies of Terrorism," *International Security* 31 (1): 49-80.

Lewis-Beck, Michael S., and Mary Stegmaier. 2000. "Economics Determinants of Electoral Outcomes," *Annual Review of Political Science*, 3: 183-219.

Ludvigsen, Stian Skar. 2005. "The Cost of Ruling Israel: Measuring the Political Cost of Terrorism," Unpublished manuscript, University of Bergen.

Pape, Robert A. 2003. "The Strategic Logic of Suicide Terrorism," *American Political Science Review* 97 (3): 343-361.

Pape, Robert A. 2005. *Dying to Win: The Strategic Logic of Suicide Terrorism*. New York: Random House.

Piazza, James A. 2006. "Rooted in Poverty?: Terrorism, Poor Economic Development, and Social Cleavages," *Terrorism and Political Violence* 18 (1): 159-177.

Powell Jr., G. Bingham and Whitten, Guy D. 1993. "A Cross-National Analysis of Economic Voting: Taking Account of the Political Context," *American Journal of Political Science* 37 (2): 391-414.

Sartori, Giovanni. 1976. *Parties and Party Systems: A Framework for Analysis*. Cambridge: Cambridge University Press.

Shambaugh, George and Josiger, William. 2004. "Public Prudence, the Policy Salience of Terrorism and Presidential Approval Following Terrorist Incidents," Unpublished manuscript, Georgetown University.

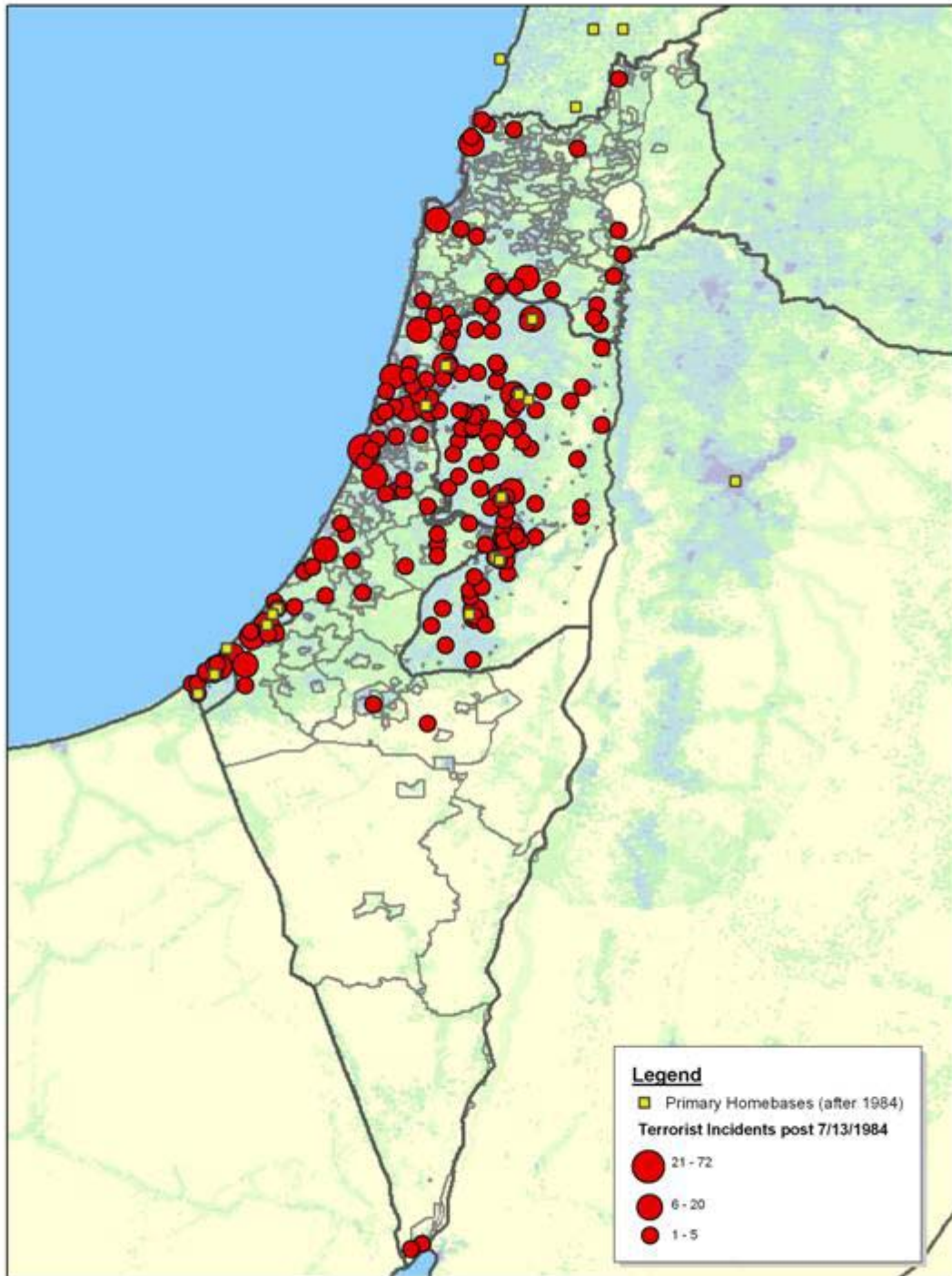
Shamir, Michal and Arian, Asher. 1999. "Collective Identity and Electoral Competition in Israel," *American Political Science Review*, 93 (2): 265-277.

Sheafer, Tamir. 2004. "Economic and Security Voting in Israel, 1949-2003," unpublished manuscript, The Hebrew University of Jerusalem.

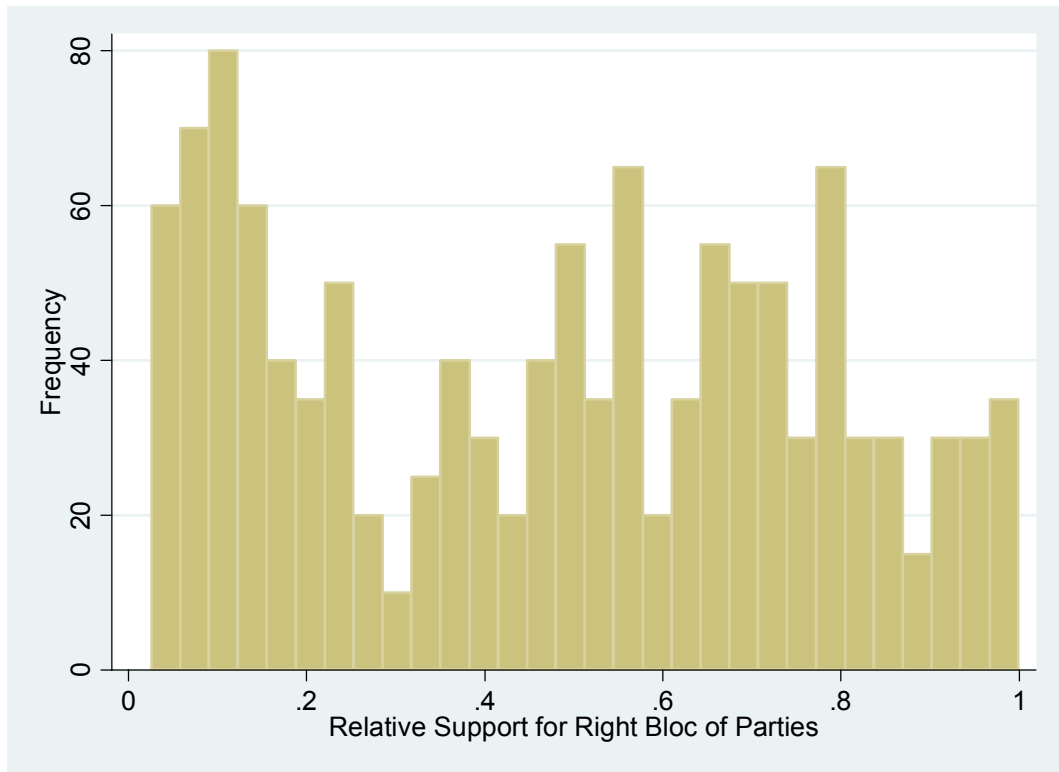
Sheafer, Tamir, Dvir, Shira, and Poran, Gitit. 2006. "Media and Attitudes Toward Peace: Framing, Associative Networks, and Public Opinion," unpublished manuscript, The Hebrew University of Jerusalem.

Siqueira, Kevin and Sandler, Todd. "Terrorists versus the Government: Strategic Interaction, Support and Sponsorship," *Journal of Conflict Resolution*, 50(6): 878-898.

**Figure 1:** Geographic Location of Terror Attacks and of Terror Factions' Home Bases



**Figure 2:** Distribution of Localities' Mean Relative Support for the Right Bloc



**Table 1:** Summary Statistics

	1988	1992	1996	1999	2003
	Localities that did not suffer terror fatalities since the previous parliamentary elections				
Number of Localities	211	210	201	228	204
Mean Vote Share for Right Bloc	0.4708 (0.2917)	0.4533 (0.2608)	0.4220 (0.3199)	0.4436 (0.2781)	0.4774 (0.3284)
	Localities that suffered a positive number of terror fatalities since the previous parliamentary elections				
Number of Localities	13	22	34	12	38
Mean Vote Share for Right Bloc	0.5088 (0.3080)	0.6075 (0.1831)	0.6227 (0.2343)	0.7047 (0.1748)	0.6876 (0.2706)
Total Fatalities since previous election	28	91	221	53	543
Total Fatalities one year before the election	6	17	76	8	348
Total Fatalities 6 months before the election	4	11	61	2	116

Entries in the table represent the means of the relevant variable. Standard deviations are in parentheses.



**Table 2:** Summary Statistics of Additional Covariates

	1988	1992	1996	1999	2003
Localities that did not suffer terror fatalities					
Distance to HB (km)	20.414 (13.085)	20.477 (11.816)	21.126 (11.743)	20.603 (13.122)	21.764 (13.112)
Regional Capital	0.0641 (0.2455)	0.04 (0.1964)	0.0189 (0.1364)	0.0511 (0.2206)	0.0239 (0.1532)
International Border	0.0641 (0.2455)	0.0533 (0.2252)	0.0613 (0.2405)	0.0638 (0.2450)	0.0478 (0.2139)
Size (1000 sq km)	84.538 (371.54)	74.905 (334.60)	72.576 (340.29)	84.473 (369.81)	83.575 (388.72)
Monthly Average Wage (NIS)			6044 (2150)	5185 (1753)	5569 (2067)
Net Migration			0.0231 (0.0748)	0.0175 (0.0733)	0.0098 (0.0314)
Localities that suffered a positive number of terror fatalities					
Distance to HB (km)	13.004 (13.060)	15.391 (22.703)	13.349 (18.552)	8.689 (7.989)	10.457 (8.615)
Regional Capital	0.2308 (0.4385)	0.4091 (0.5032)	0.4 (0.4971)	0.5 (0.5222)	0.3421 (0.4808)
International Border	0	0.1364 (0.3513)	0.0572 (0.2355)	0	0.1316 (0.3426)
Size (1000 sq km)	68.914 (78.16)	173.719 (575.97)	151.121 (473.47)	68.689 (146.56)	84.427 (148.03)
Monthly Average Wage (NIS)			6709 (1379)	5853 (1003)	5860 (1212)
Net Migration			0.0194 (0.0368)	0.0192 (0.0251)	-0.0009 (0.0346)

Entries in the table represent the means of the relevant variable. Standard deviations are in parentheses. The localities' monthly average wage and net migration correspond to the year that preceded the elections; that is, 1995, 1998 and 2002 respectively. The monthly average wage is normalized using the consumer price index with 2002 serving as the base year. Net migration is presented as a share of each locality's population.

**Table 3:** The Effect of Terror Fatalities on the Preferences of the Israeli Electorate

Dependent variable: Right-bloc vote share out of the vote share of the two blocs.

	Full Sample				Excluding Localities Occupied in 1967			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Locality's Fatalities within 3 months of the elections	0.0045 (3.91)	0.0023 (2.65)	0.0023 (2.45)	0.0013 (2.49)	0.0039 (4.69)	0.0022 (2.96)	0.0022 (2.63)	0.0014 (3.26)
Total Terror Fatalities in Israel		0.0006 (5.07)	0.0005 (3.99)	0.0006 (2.34)		0.0005 (4.13)	0.0005 (3.18)	0.0007 (2.81)
Regional Capital			0.2175 (5.50)	0.2462 (5.84)			0.2277 (6.43)	0.2569 (6.38)
Distance to Home Base			-0.0038 (-2.48)	-0.0036 (-2.29)			-0.0007 (-0.53)	-0.0006 (-0.39)
International Border			-0.1418 (-2.07)	-0.1225 (-1.55)			-0.0865 (-1.22)	-0.0723 (-0.87)
Size (1000 sq km)			0.0001 (0.84)	0.0001 (0.90)			0.0001 (0.22)	0.0001 (0.34)
Jerusalem			-0.0387 (-0.82)	-0.0462 (-0.95)			0.0576 (1.28)	0.0472 (0.98)
Split-Ticket Elections			-0.0244 (-5.72)	-0.0833 (-7.78)			-0.0234 (-5.17)	-0.0869 (-8.04)
Dev. Average Wage				0.0321 (3.90)				0.0321 (4.00)
Net Migration				-0.0995 (-0.67)				-0.0764 (-0.44)
$R^2$	0.0030	0.0034	0.0762	0.1146	0.0023	0.0033	0.0579	0.1085
Observations	1173	1173	1173	651	1058	1058	1058	594

Notes: Each column reports the estimated coefficients of a separate Ordinary least squares (OLS) regression model in which the dependent variable is the relative support for the right bloc of parties. Robust  $t$ -statistics (adjusted for clustering at the locality level) are in parentheses. The regressions in columns (1), (2), (5) and (6) include locality fixed effects.

**Table 4:** The effects of terror fatalities on the support for the incumbent prime minister

Dependent variable: right-bloc vote share out of the vote share of the two blocs.

	Full Sample	Excluding Localities Occupied in 1967
Locality's Fatalities within 3 months of the elections	0.0022 (5.89)	0.0024 (6.24)
Total Terror Fatalities in Israel	0.0007 (5.02)	0.0006 (4.37)
Right Incumbent	0.0268 (4.59)	0.0326 (4.37)
Right Incumbent * Local Fatalities	0.0001 (0.10)	-0.0002 (-0.12)
Regional Capital	0.2177 (5.51)	0.2279 (6.43)
Distance to Home Base	-0.0038 (-2.48)	-0.0007 (-0.52)
International Border	-0.1415 (-2.06)	-0.0862 (-1.21)
Size (1000 sq km)	0.0001 (0.84)	0.0001 (0.22)
Jerusalem	-0.0384 (-0.83)	0.0571 (1.29)
Split-Ticket Elections	-0.0094 (-1.49)	-0.0053 (-0.78)
No. Observations	1173	1058
$R^2$	0.0770	0.0590

Notes: Each column reports the estimated coefficients of a separate Ordinary Least Squares (OLS) regression model. Robust  $t$ -statistics (adjusted for clustering at the locality level) are in parentheses.

**Table 5:** The Effect of Terror Fatalities on Localities According to their Electoral Preferences  
 Dependent variable: Right-bloc vote share out of the vote share of the two blocs.

	For localities with a mean right-bloc vote share below				For localities with a mean right-bloc vote share above			
	0.5	0.4	0.3	0.2	0.5	0.6	0.7	0.8
Locality's Fatalities within 3 months of the elections	0.0045 (3.59)	0.0250 (2.63)	0.0322 (2.65)	0.0343 (3.48)	-0.0002 (-0.25)	0.0002 (0.35)	0.0009 (1.49)	0.0027 (1.25)
Total Terror Fatalities in Israel	-0.0004 (-2.14)	-0.0008 (-4.10)	-0.0011 (-5.26)	-0.0012 (-6.59)	0.0015 (12.45)	0.0014 (12.67)	0.0012 (9.88)	0.0008 (6.75)
$R^2$	0.1195	0.0466	0.1122	0.1902	0.1061	0.1969	0.2544	0.3525
Observations	595	488	404	316	578	443	313	178

Notes: Each column reports the estimated coefficients of a separate Ordinary least squares (OLS) regression model in which the dependent variable is the relative support for the right bloc of parties. Each regression includes the same covariates presented in Table 3. Robust  $t$ -statistics (adjusted for clustering at the locality level) are in parentheses.

**Table 6:** The Effect of Terror Fatalities on the Preferences of the Israeli Electorate

Dependent variable: Two alternative definitions of right-bloc vote share out of the vote share of the two blocs.

	Excluding the Russian Party		Excluding the Ultra Orthodox Parties	
	Full Sample	Excl. Territories	Full Sample	Excl. Territories
Locality's Fatalities within 3 months of the elections	0.0021 (2.40)	0.0022 (2.60)	0.0027 (1.61)	0.0029 (1.65)
Total Terror Fatalities in Israel	0.0005 (3.70)	0.0004 (2.88)	0.0008 (6.63)	0.0008 (5.69)
Regional Capital	0.2111 (5.22)	0.2206 (6.15)	0.2175 (5.50)	0.2256 (6.69)
Distance to Home Base	-0.0040 (-2.56)	-0.0008 (-0.60)	-0.0038 (-2.48)	-0.0007 (-0.53)
International Border	-0.1380 (-2.01)	-0.0821 (-1.16)	-0.1418 (-2.07)	-0.0708 (-1.11)
Size (1000 sq km)	0.0001 (0.79)	0.0001 (0.18)	0.0001 (0.84)	0.0001 (0.25)
Jerusalem	-0.0327 (-0.69)	0.0650 (1.45)	-0.0387 (-0.82)	-0.0181 (-0.40)
Split-Ticket Elections	-0.0370 (-9.34)	-0.0370 (-8.84)	-0.0244 (-5.72)	-0.0460 (-9.15)
$R^2$	0.0786	0.0590	0.0872	0.0686
Observations	1173	1058	1173	1058

Notes: Each column reports the estimated coefficients of a separate Ordinary least squares (OLS) regression model. In the first two columns the dependent variable is the relative support for the right bloc of parties excluding the Russian party. In the last two columns the dependent variable is the relative support for the right bloc of parties excluding the ultra orthodox parties. Robust *t*-statistics (adjusted for clustering at the locality level) are in parentheses.

**Table 7:** The Effect of Terror Fatalities on Electoral Preferences using Different Time Spans  
 Dependent variable: Right-bloc vote share out of the vote share of the two blocs.

	Full Sample				Excluding Localities Occupied in 1967			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Locality's Fatalities within:								
- 3 months of the elections	0.0023 (2.45)				0.0022 (2.63)			
- 6 months of the elections		0.0015 (3.53)				0.0014 (4.00)		
- one year of the elections			0.0013 (3.04)				0.0015 (2.90)	
- since the previous elections				0.0012 (3.12)				0.0013 (3.00)
Total Terror Fatalities in Israel	0.0005 (3.99)	0.0003 (4.05)	0.0001 (4.51)	0.00007 (4.20)	0.0005 (3.18)	0.00024 (3.24)	0.00009 (3.82)	0.00006 (3.50)
Regional Capital	0.2175 (5.50)	0.2177 (5.51)	0.2166 (5.46)	0.2142 (5.37)	0.2277 (6.43)	0.2279 (6.44)	0.2264 (6.35)	0.2238 (6.23)
Distance to Home Base	-0.0038 (-2.48)	-0.0038 (-2.48)	-0.0038 (-2.48)	-0.0038 (-2.47)	-0.0007 (-0.53)	-0.0007 (-0.53)	-0.0007 (-0.52)	-0.0007 (-0.52)
International Border	-0.1418 (-2.07)	-0.1420 (-2.08)	-0.1420 (-2.08)	-0.1416 (-2.07)	-0.0865 (-1.22)	-0.0867 (-1.22)	-0.0866 (-1.22)	-0.0864 (-1.22)
Size (1000 sq km)	0.0001 (0.84)	0.0001 (0.84)	0.0001 (0.85)	0.0001 (0.84)	0.0001 (0.22)	0.0001 (0.22)	0.0001 (0.23)	0.0001 (0.22)
Jerusalem	-0.0387 (-0.82)	-0.0447 (-0.95)	-0.0602 (-1.28)	-0.0773 (-1.54)	0.0576 (1.28)	0.0524 (1.17)	0.0323 (0.70)	0.0147 (0.29)
Split-Ticket Elections	-0.0244 (-5.72)	-0.0249 (-5.94)	-0.0191 (-3.90)	-0.0231 (-5.26)	-0.0234 (-5.17)	-0.0238 (-5.38)	-0.0183 (-3.48)	-0.0220 (-4.73)
$R^2$	0.0762	0.0765	0.0772	0.0759	0.0579	0.0563	0.0586	0.0583
Observations	1173	1173	1173	1173	1058	1058	1058	1058

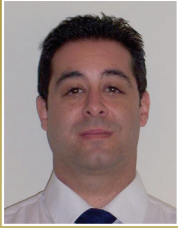
Notes: Each column reports the estimated coefficients of a separate Ordinary least squares (OLS) regression model in which the dependent variable is the relative support for the right bloc of parties. Robust  $t$ -statistics (adjusted for clustering at the locality level) are in parentheses.

**Table 8:** Testing for Reverse Causality

Panel A: Full Sample					
	1988	1992	1996	1999	2003
Right Bloc Share	1.686 (0.95) [0.797]	1.9089 (1.79) [0.893]	2.0057 (1.03) [0.905]	1.3786 (0.77) [0.629]	-0.5178 (-0.27) [-0.264]
Pseudo R-squared	0.5544	0.6240	0.6794	0.4505	0.7250
No. Observations	224	232	235	240	242

Panel B: Excluding Localities Occupied in 1967					
	1988	1992	1996	1999	2003
Right Bloc Share	0.0644 (0.06) [0.028]	0.7071 (0.59) [0.303]	-1.8364 (-0.71) [-0.750]	-3.5752 (-1.51) [-1.500]	-3.9709 (-2.82) [-1.855]
Pseudo R-squared	0.6134	0.6675	0.7730	0.5528	0.8098
No. Observations	203	209	212	216	218

Each column presents the coefficients from separate Poisson regressions where the dependent variable is the number of terror fatalities between two successive national parliamentary elections starting on the date of the election indicated in the column's title and the independent variables are as specified in model (2) above. Robust *t*-statistics are in parentheses. Elasticities evaluated at the means appear in brackets.



**Dr. Claude Berrebi** is an economist at RAND and an affiliate member of the Pardee-RAND Graduate School faculty. Dr. Berrebi's work on terrorism has been published in *Defence and Peace Economics*, the *Journal of Conflict Resolution*, the *Journal of Economic Perspectives*, and *Peace Economics, Peace Science and Public Policy* among others. Dr. Berrebi's terrorism research has been featured extensively in media outlets such as the ABC News, the Atlantic Monthly, CNN fortune, the Daily Times, the Daily Tribune, the Jerusalem Post, the New-York Times, Newsweek, and the Observer among others. Dr. Berrebi received a Ph.D. in economics from Princeton University in 2005. He holds B.A. and MA degrees in economics, both Summa Cum Laude, from The Hebrew University, an MBA in finance Cum Laude from the Hebrew University Business School, and a second Masters degree in Applied Microeconomics from Princeton University.



**Dr. Esteban F. Klor** is a faculty member of the Economics Department at The Hebrew University of Jerusalem since 2003 and is a Research Affiliate at the Centre for Economic Policy Research (CEPR). He specializes in Political Economy and Public Economics. His work has been published in *The Journal of Conflict Resolution*, *The Journal of Public Economics* and the *International Journal of Game Theory*, among others. Dr. Klor received a Ph.D. in economics from New York University in 2002. He holds B.A. and MA degrees in economics from The Hebrew University. Prior to joining the department of economics at The Hebrew University, Dr. Klor was a post-doctoral fellow at The Wallis Institute for Political Economy at The University of Rochester.

The ENS Program, established in late 2003, is an inter-mural program aiming to initiate, encourage, and facilitate high quality academic research and policy position papers on the interconnections between economics and defense. The close links between economic strength and development on one hand, and defense capabilities and security on the other are well recognized. Nevertheless, there is little theoretical and empirical research on these links by the academic community in Israel available to support policy making in these critically important matters. The Program holds periodic research meetings, organizes workshops on defense economics, and provides financial support on a competitive basis to proposals by researchers and graduate students submitted in response to widely circulated Calls for Proposals. Program participants include economists and researchers in other disciplines from various universities in Israel, research departments in the Bank of Israel and other government agencies, and some current and past officials in government and defense related organizations and industries. The Program Director is Prof. Dan Peled and the Coordinator is Col. (Res.) Moshe Elad.



**Samuel Neaman Institute**  
for Advanced Studies in Science and Technology  
**Technion-Israel Institute of Technology**  
Technion City, Haifa 32000, Israel  
Tel: 04-8292329, Fax: 04-8231889  
[www.neaman.org.il](http://www.neaman.org.il)