Suicide Bombing As A Strategic Instrument of Protest: An Empirical Investigation

I. Introduction

It would elicit little debate to state that since the non-violence protest movements of Mohandas Gandhi, Martin Luther King Jr., and Nelson Mandela, the acts of suicide bombings, more than any other single form of political protest, have left their greatest imprint on global politics during the past two decades. Although acts of self-sacrifice for a larger cause have been around since the earliest times of recorded history, the events of September 11 riveted the world's attention to the unprecedented threat.[1] Facing unconventional nature of attack, the popular press (Cohen, 2002) as well the political decision-makers quickly resorted to the image of irrational fanatics carrying out desperate acts. John Warner, the Chairman of the Senate Armed Services Committee, for instance, stressed the need for preemptive military action, since, "those who would commit suicide in their assault on the free world are not rational (Atran, 2003)." The purpose of this study is to empirically demonstrate that 1) the terrorist groups choose their acts with a great deal of deliberation, reflecting their ideology, opportunity, and expertise, and 2) the suicide attacks in Israel and the Palestinian territories can be explained with the help of a behavioral model, indicating a similar deliberateness of their use as strategic weapons. Based on our findings, we propose a number of policy recommendations.

Acts of terrorism, particularly where the actor accepts her/his demise as certainty assault our notion of human rationality to the core. Facing the conundrum, a number of scholars have attempted to understand this extreme behavior by looking for clues in the a) psychological profiles of the suicide bombers, b) in the external conditions of poverty or other economic woes, or c) have sought explanation in the chaotic discourse of religious beliefs and ideology. Those who have attempted to develop psychological profile of a typical bomber have failed to discover any definite pattern that can be profitably used by policy-makers (Andoni, 1997, Sprinzak, 2000). Psychological investigations have also produced a mixed bag of tangible outcomes. For instance, Sarraj (2002), a noted Palestinian psychologist, argues that the primary motivations behind suicide bombing are a mix of guilt, shame, and an overwhelming desire to avenge the perceived injustice wrought to their land by the Israeli authorities.[2] Others have found evidence of repressed sexual fantasies in the young men (Konet 2001) and women (Morgan, 2002) in their decision to participate in the acts of self-immolation. Krueger and Maleckova (2002) show that contrary to the popular notion, poverty, lack of education and other factors of economic opportunities are not directly linked with the bomber's sample profiles. A number of other scholars have concentrated on religious teachings and the process of socialization in preparing the mindset of a prospective suicide bomber (Juergensmeyer, 2000; Benjamin and Simon, 2002; Kelsay, 2002).

In this study, we do not explore the rationality of individual actors and instead concentrate on the use of suicide bombings as strategic weapons by the political leadership of the rebel groups. In the past, a number of econometric studies have analyzed incidents data concerning different aspects of violent protest to peer into the strategic decision-making mode of the dissident groups (Enders and Sandler,1993; Enders, 1995; Moore, 1998). However, none of these studies include suicide bombings. The dearth of empirical research on suicide bombing can surely be accounted for by the paucity of systematic data, since suicide bombings as a form of sustained strategic action are of relatively recent origin.[3] Although the Tamil Tigers (LTTE) created a mayhem with these acts within and outside of Sri Lanka in the 1980's (Hellmann-

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[1] For a history of terrorism see, Laqueur (2001).

[2] On this also see Butler (2002).

[3] Although suicide attacks have been known since antiquity, few groups have attempted to use it over a long period of time in the past with the possible exception of the Kamikaze attacks by the Japanese pilots during the WWII (Axel 2002; Ohnuki-Tierney 2002).

Rajanyagam, 1993; Narayan Swamy, 1994, Ganguly and McDuff, 2003), the last two decades have witnessed its systematic use within the political boundaries of Israel and the territories of governed by the Palestinian Authorities (PA). Fortunately for the empirical researchers, of late, a number of outfits are collecting data, which can facilitate econometric analyses into the causes of these events.

In this study, we will offer an explanation for the incidents of suicide bombings by the two leading Palestinian dissident organizations, the Islamic Resistance Group (Hamas) and the Palestinian Islamic Jihad (PIJ), covering a twelve-year span of 1991-2002.[4] The following section presents the data used in this research and, by taking a look at some of the most active dissident groups around the world, broadly establishes that these groups choose their weapons of violence with a great deal of deliberation reflecting their organizational goals, ideology, and cultural environment within which they operate. This section also provide a thumbnail sketch of the dissident political organizations active within Israel, the West Bank and the Gaza Strip, which explains the basis of our econometric model. The third section offers an empirical model and tests the relevant hypotheses. The concluding section discusses political and policy implications of our findings.

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[4] It is generally recognized that there is no general official definition of terrorism, although there are many functional descriptions. For instance, Wilikinson (2001: 206) describes it as a special form of political violence with five characteristics:

"1. It is premeditated and aims to create a climate of extreme fear or terror.
2. It is directed at a wider audience or target than the immediate victims of the violence.
3. It inherently involves attacks on random and symbolic targets, including civilians.
4. The acts of violence committed are seen by the society in which they occur as extra-normal, in the literal sense that they breach social norms, thus causing a sense of outrage; and
5. Terrorism is generally used to try to influence political behaviour in some way: for example, to force opponents into conceding some or all of the perpetrators demands, to provoke an over-reaction, to serve as a catalyst for more general conflict or to publicise a political or religious cause, to inspire followers to emulate violent attacks, to give vent to deep hatred and the thirst for revenge, and to help undermine governments and institutions designate as enemies by the terrorists."

II. The Global Pattern of Violent Protest

This study uses data collected by the Israeli-based International Policy Institute for Counter Terrorism (ICT). These data are available in the public domain at http://www.ict.org.il/. Based on this dataset we have presented terrorist activities of a number of important rebel organizations around the world in Table 1. The cells of the Table show each activity as a percentage of the group's total activities. The last row presents the sum of the three most prevalent acts of violence as a percentage of each group's total activities. From this list one can discern the specialized nature of these groups. Thus, the Basque Homeland and Freedom Party (ETA) and the Irish Republican Army's activities are primarily concentrated on bombings, car bombings, and shootings (96 percent and 94 percent of their total activities). The Peruvian group Sendero Luminoso (the Shining Path) prefers car bombing, shooting, and hostage taking (90%). The Islamic rebel group of the Philippines, the Abu Sayyaf group and the Revolutionary Armed Forces of Colombia (FARC) on the other hand specialize in kidnapping and hostage taking. They comprise 91 percent and 82 percent of their respective activities. Only a handful of the world's terrorist organizations engage in suicide bombings. Of the 52 major groups listed by the ICT, only nine engage in suicide bombings. Of them, the ones that are active in the Middle East (8 out of 9) have committed 89 percent of all suicide bombings during the 12-year study period, from 1991 to 2002. Hamas and the PIJ follow the path of violence concentrating on suicide bombings, shootings, and knife attacks. Thus, it is clear that violent opposition groups do not choose their weapons of terror in a random fashion but are guided by their internal organizational logic.

[Table 1 about here]

In order to empirically test the hypothesis that the terrorist groups choose their acts, which reflect their specific ideology, opportunity, and skill, we performed a principal component analysis for the data of 16 most active groups in the world.[5] The results, shown in Table 2 support our hypothesis. We have arranged the components according to their highest loading in the five categories by examining the direction of correlation with the latent variables. This Table offers further evidence toward the hypothesis that dissident groups do not choose their activities randomly, but do so with careful consideration; they pick those, which are closest to their ideology, expertise, opportunity, and the general *modus operandi*. Let us look at the logic of association of violent activities as identified by principal component analysis. The first category consists of shooting attacks, knifing attacks, grenade attacks and suicide bombings. These attacks are characterized by the fact they require the assailants to accept the certainty of their death or be extremely close to their victims. We call the participants of this category of attacks, *ideological terrorists* since, from their assumption of extreme risk we can conjecture that they are primarily inspired by ideological fervor, religious extremism (Hamas, the PIJ and the Al-Qaida) and/or personal charisma of a leader (the LTTE). We call these groups "ideological" because apart from the technical know how and complex logistical needs to carry out a successful suicide attack, these acts require supremely dedicated cadres who would be willing to sacrifice their lives for their cause. Similarly if we examine the other activities within this factor, we see that shootings and grenade attacks also demand physical proximity to the target, which indicates the assumption of extreme personal risk by the attacker(s).

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[5] These groups include, the Abu Sayyaf Group (the Philippines), Al-Aqsa Brigade, Al-Qaida, Basque Homeland and Freedom Party (ETA: Spain), Fatah, Fatah-Tanzim, Front for the Liberation of Palestine (PFLP), Hamas, Hizballah, Irish Republican Army (IRA), Kurdish Workers' Party (PKK:Turkey), Lashkar-e-Toiba (Kashmiri Separatist group), Liberation Tigers of Tamil Elam (LTTE: Sri Lanka), Palestine Islamic Jihad (PIJ), Revolutionary Armed Forces of Columbia (FARC), Sendero Luminoso (Shining Path: Peru).

[Table 2 about here]

The second category of attacks is designed for groups with high levels of professional expertise, which does not necessarily call for self-immolation. This category includes bombings, car bombings, letter bombing, mortar and rocket attacks. All of these involve a number of specialized skills. These attacks allow the attackers time to escape or carry them out anonymously. The IRA and the ETA fall in this category (Cragin and Chalk, 2003; Alexander, Swetnam and Levine, 2001). We would call these groups *Professional Terrorists*. Although these groups may use religion or other ideologies as their tool, the participants are, perhaps, less motivated by acts of zealotry.

The third category of activities are undertaken primarily by the groups in order to make financial gains. These groups' (e.g., FARC, the Abu Sayyaf Group)[6] preferred weapons include hostage taking and kidnapping. Since the hostages are held for ransom, and usually for quite a large amount, we may conjecture that those taking part in these are motivated primarily by their pecuniary considerations. We may call them *anomic terrorists*, since they attempt to operate within an environment of anomie or lawlessness and thrive in failed states or in nations with weakened central control.

We call the fourth group *hooligan terrorists*, since their activities (arson and vandalism) do not usually require specialized skill or disciplined self-sacrifice. Although, in the factor analysis, they formed a separate category, we find no group in our list, which depends primarily of these activities.

The fifth group consists of two separate components, each with a single activity, lynching and stoning. We can conceptually consider them to be expressions of a single type, which we call *vigilante terrorists*. These activities require a large number of participants resembling more of mob violence than acts of covert planning and execution by a small band of people, typical of other terrorist acts.

II.2 The Middle Eastern Politics and the Political Profiles of the Dissident Groups

This article is specifically focused on Hamas and the PIJ groups as case studies for suicide bombing. Therefore, before proceeding further, we would like to present a thumbnail sketch of the various radical groups and their interrelationships, operating within Israel and the Palestinian territories.

The history of Palestinian nationalism began with the rise of the Palestine Liberation Organization (PLO) in the mid 1960's as a distinctive nationalistic movement (Al-Shuaibi, 1980; Arafat, 1982; Nassar, 1991; Nofal, et al. 1998; Sela and Ma'oz, 1997). The early Palestinian struggle was subsumed within the broader Arab identity promoted by Gamal Abdel Nasser and the Baath Party of Syria. However, the devastating war of 1967 and the success of a small band of fighters in inflicting heavy damage to a column of Israeli armed forces in the village of Karameh created an intense feeling of Palestinian pride separate from the wounded Arab identity. As a result of the ensuing political dynamics, a number of groups, such as the Fatah, the Syrian sponsored Saiqa, the Popular Front for the Liberation of Palestine (PFLP) and its offshoot, Popular Democratic Front for the Liberation of Palestine (PDLFP), with diverse ideological orientation, merged under the umbrella of the PLO.[7]

Among the various groups under the PLO, the Fatah is the largest. Although, the PLO is largely secular, the Fatah's cultural ethos is distinctly Sunni Islamic. Fatah also carries the largest number of cadres and resources and, during the study period, was dominated by Yasir Arafat and his group of Palestinians who lived in exile before 1994 and then located in the Gaza strip and the

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[6] See, for instance, Pulido and Alberto (1996),

[7] See for example, Jamal R. Nassar (1991)

West Bank regions.[8] The Fatah's ideology being highly nationalistic, it quickly charted a course that is distinct from the interests of other Arab nations. Thus, the Fatah considers itself as the most mainstream Palestinian organization and as such, is entitled to "speak for the Palestinian question" (Said, 1979: 160).

The Popular Front for the Liberation of Palestinian (PFLP) is a Marxist-Leninist group founded in 1967 by George Habash. In its ideology, the PFLP sees itself as the representative of the working class Palestinians and aims at liberating all of Palestine and establishing a democratic socialist state (Hudson, 1972). Although the PFLP was one of the original members of the PLO, it withdrew itself from the umbrella organization in 1993 in protest of Yassir Arafat's peace accord with Israel and joined the Alliance of Palestinian Force to oppose the Oslo Agreement. However, this alliance proved to be short lived. In 1996 the PFLP split from the Alliance and its ideological brethren, the Democratic Front for the Liberation of Palestine (DFLP).[9] Also, after the breakdown of the Oslo peace process and Arafat taking a more radical approach toward Israel, the recent years of the study period saw a closer cooperation between the PFLP and the PLO.

The Palestinian national identity -- similar to that of most other Islamic nations -- collides and yet often comfortably coexists with the other overarching identity, the Islamic identity. While the PLO was following a mostly secular path and was rising in popularity, the prospect of a peaceful settlement with the Jewish state brought about violent disagreements within the Palestinian community. It pitted the largely secular and increasingly accommodating PLO against those holding a strong Islamic identity along with the ideology of not acceding even a "thimble full" of Palestinian sand to Israel. Hence, challenges to the PLO, in general, and Arafat, in particular, came primarily from two groups, Hamas and the Islamic Jihad. In January 1988 the PLO and the leadership of the *Intifada* movement issued a fourteen-point declaration calling for a Palestinian state to coexist with Israel. A month later Hamas was officially founded.[10]

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[8] It is important to note here that in this article, we are using the term PLO, although after 1994, the organization transformed itself into the Palestinian Authority (PA).

[9] Although the DFLP was, like the PFLP, a pro-Soviet socialist group, it broke with the latter over its agenda of creating a class struggle among the poor and working class Palestinians.

The name Hamas is an abbreviation of *Harakat al-Muqawama al-Islamiyya* (Islamic resistance movement). It emerged as an Islamic alternative to the PLO during the first *Intifada* uprising in the Gaza Strip and the West Bank. In its ideology, Hamas is opposed to the secular character of the PLO[11] and its program of creating a separate Palestinian state in the Gaza Strip and the West Bank.[12] By the placing the issue in the religious Islamic context, meaning, and imagery, Hamas has been able to successfully put together a mass political movement that directly challenges the power and authority of the PLO and Arafat. The rise of Hamas is further attributed to the frustration of the Palestinian populace regarding the inability of the Palestinian

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[10] Before this date, Hamas was more of a charitable organization, serving the poor Palestinians primarily in the Gaza Strip.

[11] The Article 1 of its Charter proclaims, “The basis of the Islamic Resistance Movement is Islam. From Islam it derives its ideas and its fundamental precepts and views of life, the universe, and humanity; and it judges all its actions according to Islam and is inspired by Islam to correct its errors.” (Mishal and Sela, 2000, 177). And it adds the Muslim Brotherhood moto in Article 5, “Allah is its (Hamas’s) goal, the Prophet is its model, and the Qur’an is its constitution” (ibid: 178).

[12] The Article 11 states: “the Islamic Resistance Movement believes that the land of Palestine is an Islamic *Waqf* [endowed] to all Muslim generations until the day of resurrection. It is not right to give it up or any part of it. Neither a single Arab state nor all Arab states, neither a king nor a president, not all the kings and presidents, nor any organization or all of them – be they Palestinian or Arab – have such authority, because the land of Palestine is an Islamic Waqf [endowed] to all Muslim generations until the day of resurrection.” (ibid: 181).

Authority (PA) to deliver a transparent, democratic, and efficient administration. Furthermore, since the peace process began in 1993, the PA emerged to the world as the sole representative of the Palestinian people. As the successive Israeli governments negotiated with the PA, Hamas saw itself being increasingly marginalized. Therefore, Hamas maintained a delicate balance among its professed political radicalism, its myriad social service delivery programs, and its opposition to the PA through a shrewd use of controlled violence that not only confronts the Israeli government but also challenges the PA's dominance among the Palestinians. In the process, inspired perhaps by the success of Hizballah in Lebanon, the tactic of suicide bombing emerged as a strategic weapon of choice for the group. Without being spontaneous expressions of frustration, Hamas learned to use them to further its own political agendas. Mishal and Sela (2000: 3) having done a comprehensive study of Hamas and its ideology, point out that: "… Hamas's decision-making processes have been markedly balanced, combining realistic considerations with traditional beliefs and arguments, emphasizing visionary goals but also immediate needs." The Hamas leaders orchestrated the sacrifices of their young followers through preaching in the mosques, published leaflets and directives, and through the socializing influence, which permeates nearly every aspect of life in the oppressive Gaza Strip and the West Bank.

Political ideology through the fundamentalist interpretation of Islam, however, is not a monopoly of Hamas. In fact, its professed nationalism is in direct conflict with the pan-Islamic transnational identity professed in the Qur'an (Huband, 1998) where all other identities are rejected in favor of an all-encompassing *ummah* (the Islamic community). Hence, it comes as no surprise to know, that Hamas's mixture of the two identities (Palestinian and Islamic) would be in conflict with a stricter interpretation of Islam. This came from the group, the PIJ.

Although both Hamas and the PIJ trace their origin to the Muslim Brotherhood movement in Egypt, there is a clear distinction in the order of priorities set forth by the two groups, particularly, regarding the question of Jihad. The Muslim Brotherhood, like many other fundamentalist Islamic movements, saw Jihad as a general duty of all Muslims and proposed that first "proper Islam" should be established throughout the Muslim world. Only after this primary goal is achieved, violent Jihad should be directed against Israel. In contrast, the irredentist Hamas movement switched the two priorities. It maintained that first, Jihad should be directed at liberating all of Palestine and then, the Muslims should direct their attention to the goal of restoring the "true faith" to the rest of the Islamic world. However, both groups absolutely reject any political arrangement that would result in the relinquishment of any part of Palestine to the non-believers.

Although a number of small radical Islamic Palestinian groups have been active under the general title of the PIJ (*Harkat al-Jihad al-Islami al-Filastini*), among them the Fathi Shqaqi faction is the most prominent. These groups are inspired more by the Pan-Islamic ideology of restoring Islam to its old glory than by the nationalistic fervor of creating a Palestinian state in Israel, despite the fact that they hold Israel as the "Zionist Jewish" state and the first target of their collective wrath. Dismayed by the lack of radicalism of the Islamic Brotherhood, specifically toward Israel, Fathi Abd al-Aziz Shqaqi a Palestinian born in the Gaza Strip and an Egyptian trained physician along with Abd al-Aziz Odah and Bashir Musa established their own Jihadi umbrella organization around 1979. The group was particularly inspired by the revolutionary success of Aytollah Khomeini in Iran. Even though adherence to a single Imam is inimical to the Sunni tradition, Shqaqi penned an admiring tract profiling the Ayatollah, which prompted his expulsion from Egypt. Because of the PIJ's emphasis on Pan Islamic ideology, the group maintained a close contact with the radical groups in Israel as well in Syria, Lebanon and Iran. Over the years, the PIJ has developed its base among intellectuals and students, primarily in the Gaza Strip. The assassination of Shqaqi, in October 1995 in Malta,[13] robbed the PIJ of it charismatic leader and, after Hamas switched to suicide attacks, the two groups started cooperating closely with each other.[14]

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[13] Although the murder of Mr. Shqaqi remains unsolved, there is a strong, but unfound suspicion that it was the work of the Israeli Intelligence agency, Mossad.

The byproduct of the Oslo Peace Agreement was the strengthening of the PLO as the sole representative of the Palestinian people, a prospect that threatened its ideological rivals. In response, Hamas and the PIJ stepped up their violent campaign against the Israeli government. In particular, they discovered the power of suicide attacks. These attacks succeeded in inflicting deep damage not only on the Israeli politics but also, for the first time, the cruel equation of relative losses, measured in terms of lives lost turned against the Israelis (Radlauer 2002). Facing this unprecedented level of violence, Israel reacted sharply by imposing new punitive measures based on collective guilt, which further alienated and radicalized a large segment of the Palestinian population, to whom any peaceful coexistence with the Jewish state lost its appeal. This process of disenchantment was also aided by the corruption and ineptitude of the Palestinian Authorities to set up an efficient government. Finally, its inability to secure an independent Palestinian state from the increasingly recalcitrant Labor Party government of Ehud Barak exposed the futility of cooperative strategy of the PA and the fundamental weaknesses of the Oslo peace process.[15] Amidst heightened tension created by the symbolic incursion of Sharon to the Al Aqsa Mosque and the consequent spate of attacks by the radical Palestinian groups dealt the final death knell to the peace process. Ehud Barak's defeat and the election of Ariel Sharon saw the formal end of the process of a negotiated peace. Seeing the prospect of losing the global recognition of being the sole representative of the Palestinian people as well as losing political clout among its constituents, a number of factions within the PLO umbrella organization started following the path drawn by Hamas and the PIJ and decided to carry out the most successful of the violent strategies, suicide bombings.[16]

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[14] See, http://www.ict.org.il/.

[15] Although the PLO had officially eschewed violence against Israel, the entire time period saw continued armed attacks by the PLO affiliated groups, although they did not stage any suicide attack before the peace process came to an end.

By the time it became evident that the Oslo peace process between Israel and the PLO has failed, the Tanzim group, the armed wing of the Fatah faction started its campaign of suicide bombing. This paramilitary wing of the Fatah played a major role in October 2000 when it was becoming apparent that peace talks were at a dead end, and the incendiary Ariel Sharon decided to make a symbolic visit to the *Haram-al-Sharif* (the Al-Aqsa Mosque). The breakdown of the last ditch Camp David meeting, coupled with Sharon's direct affront to the Islamic as well as Palestinian identity, saw the formation of yet another PLO affiliated radical group, the Martyrs of Al Aqsa (or the Al-Aqsa Brigade). This group was founded by a group of radicals in the Balata refugee section of Nablus. Many of the leaders of the group are the former child participants of the first *Intifada* of 1987. Along with the Tanzim and the Al-Aqsa Brigade the PFLP redoubled their efforts to achieve the dual goals of retaliating the actions by the Israeli government as well as attempting to curb the growing influence of the ultra-religious Hamas and the PIJ, especially among the disaffected youth.

Our brief sketch of the Palestinian rebel groups must include the Syrian and Iranian backed radical Shi-ite group, the Hizballa (the Party of God). Established during the Lebanese political chaos of 1982 with the ideological guidance of Ayatollah Khomeini, the Hizballah quickly established its radical credentials through a series of spectacular acts. However, for our current study, the Hizballah holds limited interest since it has been involved in only one suicide attack within the political boundaries of Israel and the territories controlled by the Palestinian Authorities during the study period and also because of its history and ethnic composition, it follows a different cycle than do Hamas and the PIJ, the central focus of this study.

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[16] By this time, an overwhelming portion of the Palestinians was supportive of the suicide attacks against the Jewish state (see Luft, 2002).

Figure 1 presents the time series of half-yearly data on suicide bombings. In this diagram, we have combined the total number of incidents of suicide bombings of the four affiliated PLO groups under one category. They are: the Al-Aqsa Brigade, the Fatah, the Fatah-Tanzim, and the PFLP. The plotting of this time-series data quite clearly narrates the story of suicide bombing within Israel.

[Figure 1 about here]

III. Model of Suicide Bombing and Operationalization of Variables

Why does an organization take a particular decision to engage in acts of violence? Based on the standard rational actor model of organizations, we can hypothesize that an organization takes decisions to maximize its ideological as well as organizational goals. Thus, these actions reveal the group's preference for maximizing its ideological aim as well as its need to compete for power and prestige within the general client groups. In fact, looking at this aspect of terrorism, it is akin to a firm wanting to increase its market share. Further, the groups also engage in violent acts of rebellion in order to retaliate the coercive actions taken by the authorities. Thus, we can hypothesize that a terrorist group's activities are the results of four broad categories of motivation and a measure of its organizational capabilities to carry out the suicide missions: a) retaliatory actions against its adversaries b) ideological aims of destroying the middle ground of compromise c) competition for support within its prospective support groups, and d) organizational capabilities of the groups to continue with the bombing campaign.

In the model, we have used the six-monthly incidents of suicide bombings of Hamas and the PIJ as our dependent variables.[17] We chose to use the number of incidents and not the number of Israelis killed because the latter is the result of a number of other extraneous factors, such as the time of the day, place of explosion, etc, while the former reflects the revealed choice of the two groups.

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[17] Although the estimated equations with quarterly data show very similar patterns, we decided to use biannual data since, in our judgment the bi-annual data provided us with a clearer picture.

a) Retaliation to Israeli action

We hypothesize that reaction to Israeli action by Hamas and the PIJ can be seen through three variables. The effects of some of these are likely to be positive on the incidents of suicide bombings, while the others will reduce the probability of a future attack.

(i) The hypothesize that a rebel organization engages in anti-systemic activities in reaction to the actions taken by the authorities, in this case the Israelis, has a long history in political science literature. Gurr (1970), for instance, argued that to push back when pushed is part of human beings' biological makeup. Since the government also calibrates its actions to the dissident group by the group's action, we can see that it lends itself to a model based on simultaneous difference equations. Thus, Gupta (1990) hypothesized that a dissident group's action in the current period (D_p) is a function of the government's action of the previous period (G_{p-1}), while the government's current action (G_p) is a reaction to the dissident group's actions in the previous period (D_{p-1}). In symbolic terms, it can be written as:

$$D_p = \alpha + \alpha'(G_{p-1}) \tag{1}$$

$$G_p = \beta + \beta'(D_{p-1}) \tag{2}$$

By substituting (2) into (1), we obtain:

$$D_p = \alpha^* + \alpha^{*\prime}(D_{p-2}) \tag{1a}$$

Where, $\alpha^* = (\alpha + \alpha'\beta)$ and

$\alpha^{*\prime} = \alpha'\beta'$

p = reaction period, or the time it takes for a rebel group or the authorities to mount a counter attack.

Thus, the composite coefficient $\alpha^{*\prime}$ reflects the direction of this action-reaction interrelation between the rebel group and the authorities. If the size of the coefficient is positive and is greater than 1, the cycle of violence exhibits an explosive cycle, with the conflict moving into an everhigher plane of violence. If it is equal to 1, the conflict remains at a constant level. This is typical of many low-level conflicts around the world, which fester in rhythmic regularity of tit-for-tat violence, each careful not to broach the upper limits of tolerance of the other. A coefficient <1 signifies a slowly dissipating cycle of violence. A negative coefficient indicates the ability of the authorities to clamp down on the dissident activities. In our model, we have, therefore, used the lagged values of the incidents of suicide bombings for the two groups (Hamas and the PIJ) as the explanatory variable for this simultaneous relationship between the rebel groups and the Israeli authorities. However, there is no a-priori way of determining the exact span of the reaction period (p). Therefore, we have treated it as an empirical question. Our experiments with the data demonstrated that last semi-annual lag provided the best result. Hence, for the model, we assumed that the reaction period in half of the period, or 3 months.

(ii) In this group of variables we have added a dummy variable, reflecting the Palestinian reaction to provocative actions taken by the Israeli authorities or its citizens. We call it "provocation" (*Provocation*). "Provocations" are primarily symbolic actions, which inflame passion among the Palestinians, particularly among the followers of Hamas and the PIJ. We identified these incidents from the chronology of significant events provided by Smith (2001) along with a number of incidents that took place since the book's publication.[18] This binary variable includes the following acts (=1 for the period, =0, otherwise):

September 1993 The signing of the Oslo Peace Accord between the PLO and the Israeli government

February 1994 Israeli settler kills 29 Palestinians in Hebron mosque

May 1996 Likud Candidate Benyamin Netanyahu elected Israeli Prime Minister

October 1998 Israel and the PLO sign Wye River Memorandum

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[18] See Charles Smith (2001)

October 2000 Likud Party leader Ariel Sharon makes a symbolic visit to the *Haram al-Sharif* (the Al-Aqsa mosque)

January 2001 Ariel Sharon elected Prime Minister of Israel

February 2001-December 2002 Sharon Administration takes highly provocative stance against the Palestinians

(iii) Not all of the Israeli actions are likely to increase the incidents of suicide bombings. Israeli punitive actions, which vary from the closer of its borders to the West Bank and the Gaza Strip, destroying family homes of the suicide bombers, along with overt and covert military actions against the rebel groups, are designed to discourage future suicide attacks. Since they are too numerous and diverse to operationalize, we hypothesize that they are functions of the shocks delivered to the Israeli society by these attacks. Hence, for this variable, we included the number of Israelis killed (*Totalkill*) in the previous six-month period. We hypothesize that in the immediate aftermath of Israeli casualties the increased security measures will decrease the incidents of suicide attacks. Further, the greater is the loss of life, the more severe is the Israeli counter-action to tighten security and exact revenge on the groups responsible for the attack. Thus, we would expect a negative correlation between the independent variable *Totalkill* and the dependent variable.

(b) Destroying the Middle Ground of Compromise: Israeli Elections

By drawing upon the work of Arrow (1957), we posit that the ideological aims of an extremist group -- particularly one which does not command the support of the majority of the population -- can be advanced only through polarization and fragmentation of the polity, which, without such radical actions, might otherwise find a compromise solution. A corollary to Arrow's Impossibility Theorem demonstrates that a minority group can exert power far beyond its numerical strength by disrupting the process of choice, where the society might have exhibited single- peaked preference. Their actions are, in fact, strategic moves designed to destroy the middle ground of compromise and split the prospective uni-modal national consensus into a multi-modal preference pattern typical of a divided society. Thus, radical groups attempt to achieve this goal in a democracy, such as in Israel, by the timing their campaign of violence to coincide with the national elections. Since a middle ground based on compromise is utterly unacceptable to the radical groups, their actions are designed to undermine the peace process; the more atrocious are the acts, the more likely it is for the electorate to be radicalized and choose candidates who are least likely to compromise. Hence, we can hypothesize that suicide bombings by Hamas and the PIJ will be correlated with the Israeli elections.[19]

(c) Rivalry and Cooperation Among the Palestinian Dissident Groups

As we have discussed above, the number of incidents of suicide bombings are the outcomes of differing allegiance and alliances of the major Palestinian dissident groups among themselves. Thus, the Hams and the PIJ are profoundly affected by the politics of the PA. Similarly, they themselves are competing for their own influence among their client groups with the Palestinian community. In order to capture this intricate interrelationship, we introduce the following variables:

(i) We hypothesize that since both Hamas and the PIJ have deep ideological differences with the Palestinian Authority (PA), they feel threatened by the prospect of the later gaining in power and prestige. The sources of this power and prestige rest with the fact that the Oslo peace process with the Israelis that started in a clandestine fashion accorded the PA an opportunity to be recognized as the sole representative of the Palestinians to Israel and the rest of the world. As a result, the radical Islamic groups felt marginalized. In order to capture the effects of this perceived growing strength of the PA and the peace process, we introduce a monotonically increasing function starting with the announcement of the Accord in 1992 and ending with its demise in 2001. Sincere there are 20 bi-annual observations during this 10-year process, in our model we introduce the variable $Oslo_t$ as 1/20 in 1992:1, 2/20 in 1992:2, 3/20 in 1993:1 etc. The peace process reached its zenith (20/20=1) during the second half of 2001. The variable takes the value 0 before and after the span of the peace process.

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[19] Israeli elections took place in June, 1992, May 1996. Then an early election was called in May 1999, where Ehud Barak was elected. His government failed in February 2001, when a special election was held only to elect the prime minister. The Israeli citizens chose Ariel Sharon and his Likud Party. However, facing increasing challenges from the opposition Labor Party, Sharon called for a general election in January 2003.

(ii) We assumed that these three groups compete for influence among their potential clientele and therefore, we introduced interactive terms to capture this aspect of their decision-making process. Therefore, we introduced the lagged incidents of Hamas suicide bombings as an independent variable in the equation for the PIJ and vice versa. Similarly, we also hypothesized that the lagged values of these two groups will be influenced by the shooting incidents by the PLO affiliated groups (*PLOshoot*), just as the activities by the PLO affiliated groups will be influenced by the suicide bombings by Hamas and the PIJ.

d) Change in Organizational Capabilities

The final group of variables used in the model measures the organizational capabilities of Hamas and the PIJ to deliver attacks on its adversaries. This capability depends on two aspects. First, the groups must be able to constantly supply willing volunteers to undertake such operations. Second, it must be able to provide the involved logistical support to carry on the attacks.

Although one cannot directly measure organization capability, we hypothesize that the assassination of master bomb-maker Yayha Ayyash, known as the “Engineer” in January 1996, put a dent in the capability of Hamas to sustain suicide attacks. However, with time, new leaders emerged to fill in this organizational gap (Jarbawi, 1996). Similarly, we also hypothesize that the assassination of the spiritual leader, Fathi Shqaqi in October 1995 while in exile in Malta dealt a similar blow to the organizational capabilities of the PIJ. Since they were watershed events in the history of the two dissident groups, we have used intercept dummies to discern their impacts on the organizations' capabilities to continue with the campaign of suicide bombings. We call these two variables, *Engineer* and *Sqaqi*. The dummy *Engineer* represents the death of Abu Ayyash in Hamas specification (= 0 for the period 1991-1995 and =1 afterwards) and *Shqaqi* represents the assassination of the PIJ's spiritual leader, Fathi Shqaqi (= 0 for the period 1991-1995:1 and =1 afterwards) in the PIJ specification.

III. Empirical Analysis

III.1 Specification

The estimation of equations explaining the incidents of suicide bombings by Hamas and the PIJ poses an important methodological problem. Since these groups are competing and sometime collaborating with one another, their actions are contemporaneously correlated. Furthermore, as can be discerned from the explanation of Figure 1, the activities of the two groups are intimately linked to the activities of the PLO. Therefore, any attempt at understanding the strategic use of suicide bombings by Hamas and the PIJ must be seen as a part of an interactive system. In order to control for the activities of the PLO affiliated groups within Israel during this period, we included a separate equation for the activities of the PLO affiliated groups, the Fathah, Fatah-Tanzim, the PFLP, and the Al-Aqsa Brigade.[20] The problem of including the PLO affiliated groups is that they did not engage in suicide attacks until the Oslo peace process was decidedly destroyed in 2001. Since, we had only a few observations of suicide attacks by the PLO affiliated groups as the dependent variable, we decided to use the number of shooting incidents by these groups. The choice of this variable is justified by the fact that the incidents of shooting have the highest loading after suicide bombings within their factor (see Table 2). Thus, we can write the system composed of the incidents of suicide bombing by Hamas and PIJ for the period 1991 to 2002 and *PLOshoot* capturing the activities of the PLO-affiliated group as follows:

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[20] It is important to keep in mind that the PA and Mr. Arafat consistently denied having any role in attacks against the Jewish state and its citizens, while the Israeli government held them responsible. Without taking any stand in this controversy, we simply referring to these groups as "PLO affiliated."

$$\begin{aligned} \mathit{Hamas}_t = {} & \alpha_0 + \alpha_1 \mathit{Hamas}_{t-1} + \alpha_2\ \mathit{Election}_{t+1} + \alpha_3 \mathrm{Pr}\mathit{ovocation}_t + \alpha_4\ \mathit{Totalkill}_{t-1} + \alpha_5\ \mathit{PIJ}_{t-1} \\ & + \alpha_6\ \mathit{PLOshoot}_{t-1} + \alpha_7\ \mathit{Oslo}_t + \alpha_8\ \mathit{Engineer} + \varepsilon_{Ht} \end{aligned} \tag{3}$$

$$\begin{aligned} \mathit{PIJ}_t = {} & \beta_0 + \beta_1 \mathit{PIJ}_{t-1} + \beta_2\ \mathit{Election}_{t+1} + \beta_3 \mathrm{Pr}\mathit{ovocation}_t + \beta_4 \mathit{Totalkill}_{t-1} \\ & + \beta_5\ \mathit{PLOshoot}_{t-1} + \beta_6 \mathit{Oslo}_t + \beta_7\ \mathit{Shqaqi} + \beta_8 \mathit{Hamas}_{t-1} + \varepsilon_{It} \end{aligned} \tag{4}$$

$$\begin{aligned} \mathit{PLOshoot}_t = {} & \gamma_0 + \gamma_1 \mathit{PLOshoot}_{t-1} + \gamma_2\ \mathit{Election}_{t+1} + \gamma_3 \mathrm{Pr}\mathit{ovocation}_t \\ & + \gamma_4 \mathit{Totalkill}_{t-1} + \gamma_5 \mathit{Hamas}_{t-1} + \gamma_6\ \mathit{PIJ}_{t-1} + \gamma_7 \mathit{Election}_{t+1} + \varepsilon_{Pt} \end{aligned} \tag{5}$$

The errors in the above specification ε_{Ht}, ε_{It}, and ε_{Pt} are contemporaneously and serially correlated. Hence, the above system can be considered as a generalized Vector Auto Regressive (VAR) process, and is estimated by using *Seemingly Unrelated Regression* (SUR) (Greene, 2003; Zellner, 1962; and Berndt, 1991). All the data series used in the above system were tested for unit-root by using augmented Dickey-Fuller tests, and none of them were found to be non-stationary. The diagnostics on the above model included using Ljung-Box Q statistic to check for significant serial correlation in the residuals.

III.2 Estimation and Interpretation of Results

The system of equations presented in equations 3, 4, and 5 may be over-parameterized. In order to obtain a more parsimonious s model, we use the Granger Causality test. We have presented our findings in Table 3.

[Table 3 about here]

The Granger-causality results present an intriguing picture where the arrows of causality run from the largest and the most influential group to the least. Thus, we can see that the PLOs shooting incidents of the previous period prompts Hamas and the PIJ to undertake suicide attacks, but not vice versa. Similarly, the previous period's attack by Hamas followers cause attacks by those of the PIJ in the current period, but not vice versa. Based on these results, we ran the parsimonious system of three equations given below. The estimated coefficients of this system are presented in Table 4.

$$Hamas_t = \alpha_0 + \alpha_1 Hamas_{t-1} + \alpha_2\ Election_{t+1} + \alpha_3\ \mathrm{Pr}ovocation_t + \alpha_4\ Totalkill_{t-1}$$

$$+\alpha_5\ PLOshoot_{t-1} + \alpha_6\ Oslo_t + \alpha_7\ Engineer + \varepsilon_{Ht} \qquad (3a)$$

$$PIJ_t = \beta_0 + \beta_1 PIJ_{t-1} + \beta_2\ Election_{t+1} + \beta_3\ \mathrm{Pr}ovocation_t + \beta_4 Totalkill_{t-1}$$

$$+\beta_5\ PLOshoot_{t-1} + \beta_6 Oslo_t + \beta_7\ Shqaqi + \beta_8 Hamas_{t-1} + \varepsilon_{It} \qquad (4a)$$

$$PLOshoot_t = \gamma_0 + \gamma_1 PLOshoot_{t-1} + \gamma_2\ Election_{t+1} + \gamma_3\ \mathrm{Pr}ovocation_t$$

$$+\gamma_4 Totalkill_{t-1} + \gamma_5 Election_{t+1} + \varepsilon_{Pt} \qquad (5a)$$

Since the system is estimated jointly, the results of each coefficient should be viewed in the context of simultaneous interaction between the dependent and independent variables. To begin with, the model, taken in its entirety explains the incidents of suicide bombings by Hamas and the PIJ extremely well. For Hamas, it explains (R^2) 77% of the variations, while for the PIJ, 87%. The closeness of adjusted R^2 values also indicates a lack of significant misspecification of the model.

[Table 4 about here]

Let us now consider the individual independent variables. However, before discussing the effects of each independent variable on the dependent variable, we should remember that being part of a dynamic interactive system, the actual impact of a single variable may turn out to be different from the estimated value of it coefficient, since the total effect of a specific variable would play out through various interrelated paths over a number of periods of time.

The results indicate that the reaction to Israeli counteraction, estimated by the coefficients of the autoregressive variables, proposed by Gupta (1990) (see equation 1a) is positive for Hamas and the PLO, but is negative for the PIJ. The results might be interpreted as follows: while Israeli policy of retribution may be ineffective against a well-entrenched and better-organized Hamas, it is more successful in containing PIJ’s suicide attacks.

The visual inspection of actual data (Figure 1) might imply that the attacks went down in the immediate aftermath of the assassination, particularly of Mr. Ayyash (Engineer). However, over the next decade, it did not show any long-term adverse effect. Perhaps, because of this, the coefficient is not statistically significant for Hamas. In contrast, the coefficient for Mr. Sqaqi's assassination is highly significant for attacks by the PIJ. These results tend to support the conclusion that while the death of Mr. Ayyash left only a technical void, the assassination of Mr. Sqaqi dealt a deeper blow to the followers the charismatic leader, prompting them to renew their effort in the name of a new martyr.

The impact of external acts of provocation is positive for each of the three equations, particularly for the shooting attacks by the PLO affiliated groups. Since their actions get reflected through the lagged effects on the actions of Hamas, which, in turn, provides impetus for attacks by the PIJ, the total impact of these provocative events can be significant and long lasting.

Among the estimated coefficients the variable *Election* and *Oslo* show some apparently counter-intuitive results. While it the sign of the coefficient for *Election* positive and significant for Hamas, it is negative and insignificant for the PIJ. Similarly, the coefficient for the Oslo peace process (Oslo) is positive for Hamas but is negative for the PIJ. The theoretical model would predict a positive relationship between both of these two independent variables and the incidents of suicide bombings. Hence, negative coefficients for the PIJ may be puzzling. However, the negative coefficient of the PIJ may reflect the extremely strong regressive relationship between its activities and those of Hamas. Thus, at the prospect of an impending election or the strengthening of the peace accord, Hamas would step up on its bombing campaign to radicalize the Israeli electorate, which will be closely mimicked by the PIJ in the following period.

The PLOshoot variable demonstrates its importance to both the groups in influencing their behavior. It is positive and statistically significant for both of them.

Finally, we can see that the variable *Totalkill* fails to attain statistical significant for either Hamas or the PIJ. In other words, the highly publicized broad-ranging security measures along with collective punishments in the aftermath of suicide bombings did not show significant impact on the attacks during the study period.

The estimated system does a credible job in forecasting within the sample the incidents of suicide attacks by the two radical Palestinian groups. We have presented the plots of the number of actual attacks against the predicted in Figure 2 by rounding off the predicted values to their nearest integer.

[Figure 2 about here]

III.3 Results of Dynamic Simulation

In a simultaneous equation system with time lag an individual regression coefficient or its normalized value (Beta coefficient) may not convey its full impact on the dependent variable, as in the case of a single-equation model. This is because its impact is filtered through a number of interrelated paths over time. In order to investigate the effect of various independent variables we simulate the system given by 3a, 4a, and 5a, and conduct a within-sample forecast our dependent variables: incidents of suicide bombing by Hamas, and the PIJ. For the sake of brevity and, since we are using the series *PLOshoot* as a control variable, we are not discussing the results of its simulated values.[21] The results are given in Table 5.

[Table 5 about here]

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[21] It should be noted that the results of the forecasts shown in Figures 3 and 4 above were obtained by using a static simulation, where the actual lagged values were used. In contrast, the dynamic simulation took the forecasted values for the previous period as the lagged independent variables of the current period. The Gauss program was used for dynamic simulation, which can be obtained from the authors.

We have arranged the results of the simulation in four groups of factors. The first group of factors represents the policies of negative sanctions taken by the Israeli authorities in retaliation of suicide bombings by $Hamas_t$ and the PIJ_t. Since it is impossible to enumerate all the repressive countermeasures taken by Israel, we will approximate them by the autoregressive terms of $Hamas_{t-1}$ on Hamas, and PIJ_{t-1} on the PIJ. Also, we assumed that the Israeli countermeasures would be proportional to the outrage of such killings by making them an implicit function of the number of Israeli killed (*Totalkill*) in the attacks. Further, the assassinations of Abu Ayyash (*Engineer*) and Fathi Sqaqi (*Sqaqi*) constitute another aspect of Israeli repression.[22] The second group of variables includes those undertaken by the two dissident groups to oppose the development of any compromise between the PA and the Israeli authorities. This group includes the strategic use of suicide bombings during the elections (*election*) and the progress of the Oslo peace process (*Oslo*). The third set of variables consists of the interactive terms among the three groups revealing rivalry and cooperation among them. And finally, the fourth group is comprised of a single variable of external influence, *Provocation*.

Table 5 shows the results of the dynamic simulation by isolating the effects of each of the independent variables. The Table lists the number of incidents of suicide attacks that are forecasted by the simulation based on the estimated models for two groups. Thus, the results indicate that the punitive measures taken by the Israeli authorities in the immediate aftermath of a suicide killing (Totalkill) seem to only add to the violence; the total number of incidents of attacks without its effects are 35 for Hamas and 21 for the PIJ, which translates into a slight increase (3.5%) in the total number of actual attacks. It is interesting to note that without such reprisals, Hamas would have staged 10% fewer attacks from their actual 39, while the PIJ would have carried out 10.5% more from their actual of 19 attacks. The same story is repeated for the other variables indicating Israeli counteractions. The autoregressive term of Hamas signify the fact that without the Israeli sanctions there would have been 35 incidents by Hamas and 21 by the PIJ. The simulated results show that the assassination of Abu Ayayash has significantly increased the incidents of suicide attacks by Hamas (23%), but the death of Sqaqi had no discernable impact on the behavior of the PIJ. In sum, the results indicate that during the 12-year study period, the punitive measures taken by the Israeli authorities have been counterproductive against the socially well-entrenched Hamas but have may been somewhat more effective against the PIJ.

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[22] We are mindful of the fact that Israeli culpability in these two assassinations has not been fully established, particularly, with regard to Mr. Sqaqi's death. However, whatever the fact might be, most importantly for us, the Palestinian perception, by and large, hold the Israeli secret service responsible for the assassinations.

The next set of variables measures the two dissident groups' effort to subvert the peace process and the Palestinian accommodation of the Jewish state. The biggest contributors to the incidents of suicide attacks are the Israeli elections. They contribute nearly 44% of the attacks by Hamas. Similarly, the Oslo peace process has also contributed to Hamas's zeal to send out waves of suicide bombers (15% more).

The variables showing rivalry and cooperation among the Palestinian dissident groups demonstrate the extent of influence Hamas exerts over the PIJ. Without this unidirectional linkage, the attacks by the PIJ would diminish by more than 84%. The strength of this time-dependent relationship explains some of the puzzling contemporaneous dampening effects on PIJ, especially during the Israeli elections as well as the progress of the peace process . Although the violent activities by the PLO affiliated groups also contributed to the number of attacks by Hamas, the strength of this link is considerably less than that between Hamas and the PIJ.

Finally, both Hamas and the PIJ are affected by the acts of "provocation." In this case, the PIJ does not seem to take its cue from Hamas and respond immediately by staging its own assaults.

IV. Discussion and Policy Implications

We started out by attempting to develop a behavioral model of suicide bombing from the perspective of the two dissident Palestinian groups, Hamas and the PIJ. The inquiry leads to three broad-ranging policy implications.

In the Western nations, the popular press has coined the term "suicide bombings," while in the Islamic world they are characterized as "martyrdom." Political and contextual differences between the two terms are as wide as the chasm between the two worlds. The former term implies a sense of despondence and perhaps, some inner sense of extreme emotion and irrationality. The evidence presented in this study leaves no doubt about the deliberateness of these acts. These attacks are well-timed strategic use of human sacrifice for specific nationalistic and religious causes by the two dissident groups. The reason Hamas and the PIJ have been able to sustain their relentless campaigns is because they have found a ready supply of young men and women to carry out their political agenda. Journalist Nasra Hassan, after extensively interviewing captured activists on suicide missions has documented the incredible effort at socialization, which produces a mindset for the ultimate sacrifice (Hassan, 2001). Based on our analysis, we cannot comment on the rationality of the individual participants, however, the ability of our empirical model in explaining such a large variance of the revealed preference of the two groups firmly establishes the fact that the campaign of suicide bombings is a part of a rational strategic choice by Hamas and the PIJ.[23] In fact, the choice of suicide bombings makes sense as a strategy, which does not aim at a military victory but takes aim at sowing the greatest amount of mistrust among Jews and Palestinians.[24] Suicide bombings accomplish this in several ways. The randomness of the attacks inculcates a deep and universal sense of insecurity in the country. By sending young men and women to kill and maim noncombatant civilians, the two radical groups succeed in deepening the worst suspicion and prejudice held by the Jews about the Arabs, which makes any possibility of a compromise nearly impossible. The media coverage of the grisly scenes with panic and fear in the faces of the survivors and the rescue workers spreads fear and outrage, which strengthen those in Israeli politics who reject any compromise with the Palestinians. The resulting extreme actions by the Israeli authorities, in turn, further provoke the extremist sentiments among the Palestinians. A number of opinion surveys have consistently shown strong support for suicide bombings among the Palestinians. This public approval stems from the perception that this is the only method of violent protest that tends to equalize the death-ratio between the Palestinians and the Israelis (Luft, 2002).

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[23] Muth (1961) defined "rationality" as the ability to explain actual behavior with a set of independent variables.

[24] For a discussion of Palestinian view of suicide bombing as a strategic instrument of protest, see, Allen (2002)

Taken together, these above factors explain the second set of findings on the basis of the simulation model. In our model, we have used a number of surrogate variables to capture the multi-pronged character of Israeli punitive actions against suicide attacks. They indicate that these countermeasures have largely failed to stop suicide bombings and, perhaps, have even exacerbated the situation.

Third, and perhaps the most important finding of our model is the pivotal role played by Hamas in determining the overall picture of suicide attacks within Israel and the PA territories. Since none of the Israeli punitive actions have been highly effective, the results indicate the need to draw Hamas into the larger negotiation process. In fact, if we draw upon the experience of Sri Lanka, it appears that only way the government in Colombo has been able to stop suicide attacks is by coming to a political accommodation with the Tamil Tigers. In the case of Israel, the problem is compounded by the fact that while the Tamil Tigers are pursuing their own irredentist agenda, which can theoretically be addressed by the partition of the country, the goals of Hamas and the PIJ leave no room for the Jewish state. In such a situation, the question of a political settlement becomes impossible. However, we may be reminded that before the Oslo Agreement, even the PLO's Constitution included the irreconcilable goal of the destruction of Israel.[25]

Facing the cycle of escalating violence, the results of this study support Horowitz's (1990) contention that the only way to resolve domestic political conflict in deeply divided societies is by nurturing the middle ground of moderation. This may imply the resistance on the part of Israeli authorities to give in to the temptation of carrying out immediate and severe punishments that affect the entire Palestinian community. Similarly, it also requires the Palestinian Authorities to make serious efforts at suppressing the factories of suicide bombs and stop suicide attacks.

Rapoport (2001) shows that global terrorism takes place in waves. Today the Western world is locked in an armed struggle with the militant extremists of Islam. The wave of suicide bombings is becoming increasingly common in many parts of the world. Facing its menace, it is easy fall into trap of quick emotional responses. Terrorism expert Brian Jenkins (2001: 2) points out that "Cold blooded mass murder requires cold-blooded analysis." In order to counter this rapidly growing threat we must develop appropriate analytical capabilities to distinguish among terrorist groups, their motivations, ideologies, and tactics.

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[25] Roy (2003) points out that the Hamas leadership is well aware of their central role in the Palestinian politics, particularly in view of the weakening role of the PA. Roy argues that while an Islamic alternative is still unacceptable to the majority Palestinians, Islamic movement has shown pragmatism, which may allow its inclusion in the peace process.

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Figure 1

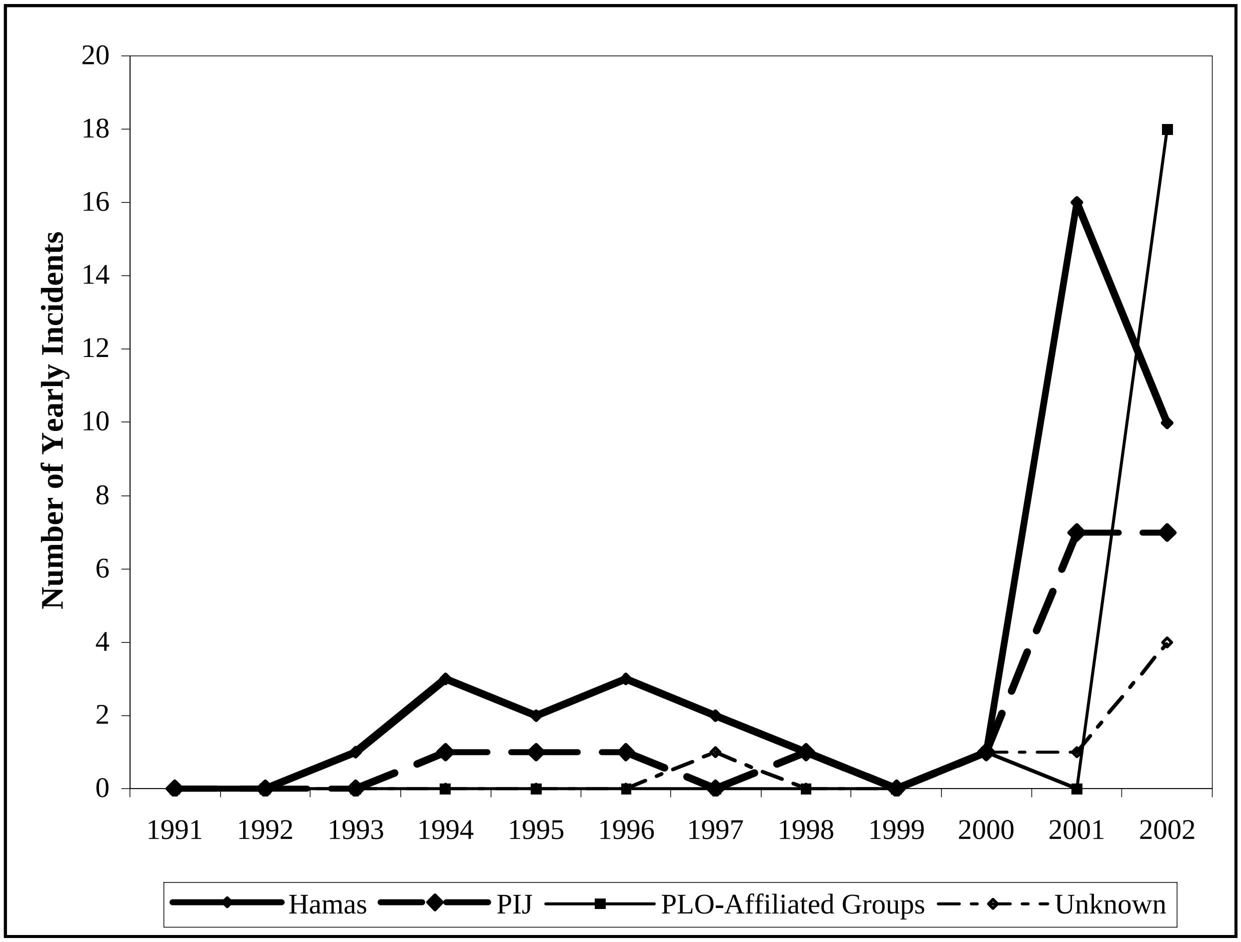

Number of Yearly Incidents
20
18
16
14
12
10
8
6
4
2
0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
Hamas
PIJ
PLO-Affiliated Groups
Unknown

Table 1
Comparison of Profiles of Hamas and PIJ with other Groups
(Percent of total activities, 1980-2002)

Activities	Hamas	Abu Sayyaf Group (ASG)	Al-Qaida	Basque Homeland and Freedom (ETA)	Rev. Armed Forces of Colombia (FARC)	Liberation Tigers of Tamil Eelam (LTTE)	Palestinian Islamic Jihad (PIJ)	Irish Rep. Army (IRA)	Kurdishtan Workers' Party (PKK)	Sendero Lumonoso (Shining Path)
Bombing	6.1	**27.3**	**13.3**	**37.3**	**7.9**	**20.7**	9.3	**25.0**	**27.6**	5.0
Car Bomb	4,3	0	**33.3**	**35.3**	**5.3**	10.3	18.5	**37.5**	0	**45.0**
Hand Grenade	2.6	0	6.7	2.0	0	0	1.9	0	3.4	0
High jacking	0	0	6.7	0	2.6	0	0	0	3.4	0
Hostage taking	0	**18.2**	0	0	7.9	0	0	0	0	5.0
Incendiary devices	0	9.1	0	0	0	0	0	0	10.3	0
Kidnapping	5.2	**45.5**	0	0	**65.8**	6.9	1.9	0	**20.7**	**10.0**
Knife attack	**7.8**	0	0	0	0	3.4	**1.9**	0	0	0
Letter bomb	0	0	0	2.0	0	0	1.9	0	0	0
Mortar attack	0	0	0	0	5.3	3.4	0	6.2	0	0
Rocket attack	0	0	6.7	0	2.6	3.4	0	0	0	0
Shooting	**37.4**	0	6.7	**23.5**	2.6	**10.3**	**27.8**	**31.5**	**13.8**	**35.0**
Suicide bombing	**34.8**	0	**26.7**	0	0	**41.4**	**35.2**	0	13.8	0
Vandalism	0	0	0	0	0	0	0	0	3.4	0
Arson	0	0	0	0	0	0	0	0	3.4	0
Chemical attack	0	0	0	0	0	0	0	0	0	0
Stoning	0	0	0	0	0	0	1.9	0	0	0
Vehicle attack	1.7	0	0	0	0	0	0	0	0	0
Lynching	0	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100
Top three activities as a percent of the total	**83.6**	**91.0**	**73.3**	**95.6**	**81.6**	**72.4**	**82.0**	**94.0**	**62.1**	**90.0**

Source: www.ict.org.il/

Table 2
Factor Analysis of Violent Activities by Selected Terrorist Groups
(1991-2002)

	Component Factors					
Activities	**Ideological terrorists**	**Professional terrorists**	**Anomic terrorists**	**Hooligan terrorists**	**Vigilante terrorists**	
Shooting	**.759**	-.228	.338	.050	.414	.242
Knifing attack	**.698**	.71	.599	.083	-.236	-.084
Grenade attack	**.678**	.377	.302	.391	-.187	-.062
Vehicle attack	**.661**	.284	.650	.156	-.039	-.045
Suicide bombing	**.659**	.128	.502	.052	.179	.021
Bombing	.274	**.631**	-.444	.307	.313	-.099
Car bombing	.403	**.621**	-.590	-.112	.204	-.135
Letter bombing	.358	**.452**	-.698	-.021	.195	.275
Mortar attack	-.561	**.384**	.308	-.438	.191	.066
Rocket attack	-.459	**.364**	.301	-.362	.110	-.230
Kidnapping	-.519	.257	**.528**	-.107	.184	.400
Hostage taking	-.601	.246	**.308**	-.338	-.044	.303
Arson	-.331	-.005	.017	**.928**	.076	.046
Vandalism	-.331	-.005	.017	**.928**	.076	.046
Incendiary devices	-.387	-.005	.012	**.887**	.004	.060
Lynching	.129	-.631	.100	-.112	**.726**	.123
Stoning	.271	-.062	-.329	.062	-.349	**.729**
Percentage of Variance	**26.91**	**18.81**	**16.68**	**13.12**	**6.83**	**5.78**
Cumulative percentage	**26.91**	**45.72**	**62.40**	**75.52**	**82.34**	**88.12**

Table 3
Granger Causality Table

Null Hypothesis	**F-statistic**	**Probability**	**Result**
Hamas does not cause PIJ	85.15	0.000	Reject at 1% level of significance
PIJ does not causeHamas	0.304	0.588	Fail to reject
PLOshoot does not cause Hamas	25.50	0.000	Reject at 1% level of significance
Hamas does not cause PLOshoot	0.524	0.478	Fail to reject
PLOSHOOT does not cause PIJ	29.275	0.000	Reject at 1% level of significance
PIJ does not cause PLOshoot	0.171	0.684	Fail to reject

Table 4

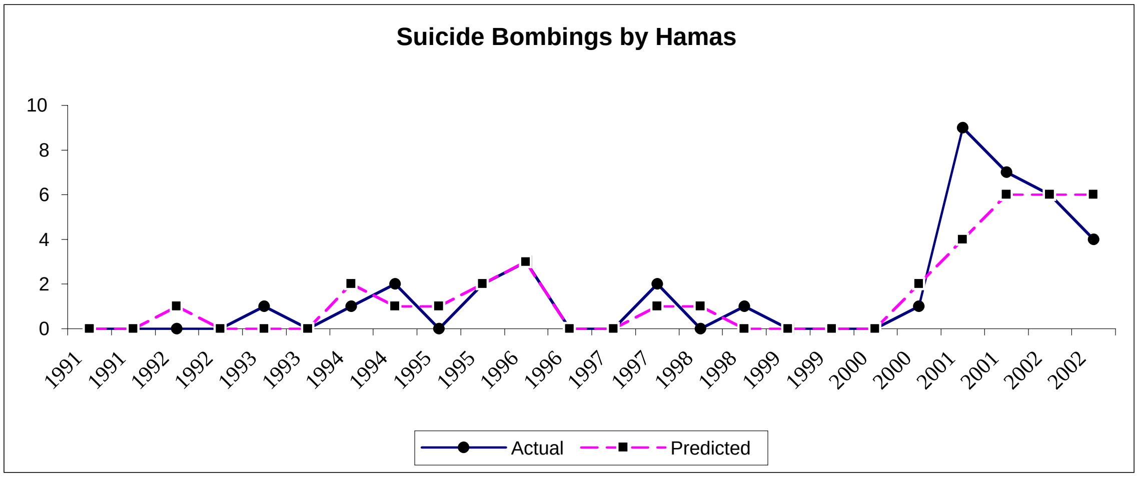
Estimated System of Equations by Seemingly Unrelated Regression (SUR) (1991 – 2002)

Independent variables	Hamas (suicide bombings)	PIJ (suicide bombings)	PLOshoot (shootings)
Intercept	-.671 -(0.69)	-.655 -(.75)	-2.79 -(1.26)
$Hamas_{t-1}$	.132 (.93)	.638 (8.64)***	-
$Election_{t}$	1.06 (1.70)*	-.612 -(1.56)	-3.20 -(1.15)
$\mathrm{Pr}\,ovocation_{t}$	.280 (42)	.351 (1.03)	5.01 (1.69)*
$Totalkill_{t-1}$	.004 (0.55)	-.004 -(.96)	-.0003 -(1.90)**
PIJ_{t-1}	-	-.332 -(2.41)**	-
$PLOshoot_{t-1}$	.196 (4.70)***	.036 (1.77)*	6.89 (1.90)**
$Oslo_{t}$	.648 (.50)	-.98 -(1.76)*	-
Engineer	.916 (1.04)	-	_
Sqaqi	-	.576 (4.10)***	_
R^2	.77	.87	.70
$\bar{R}^2$ (adjusted)	.66	.77	.62
N = 23			

Note: The t-statistics are in parentheses. *** Denotes significance at 1% level. ** Denotes significance at 10% level. * Significant at 5% level.
The variable PLOshoot is used as a control variable for the system.

Figure 2

Plot of Actual versus Predicted Values



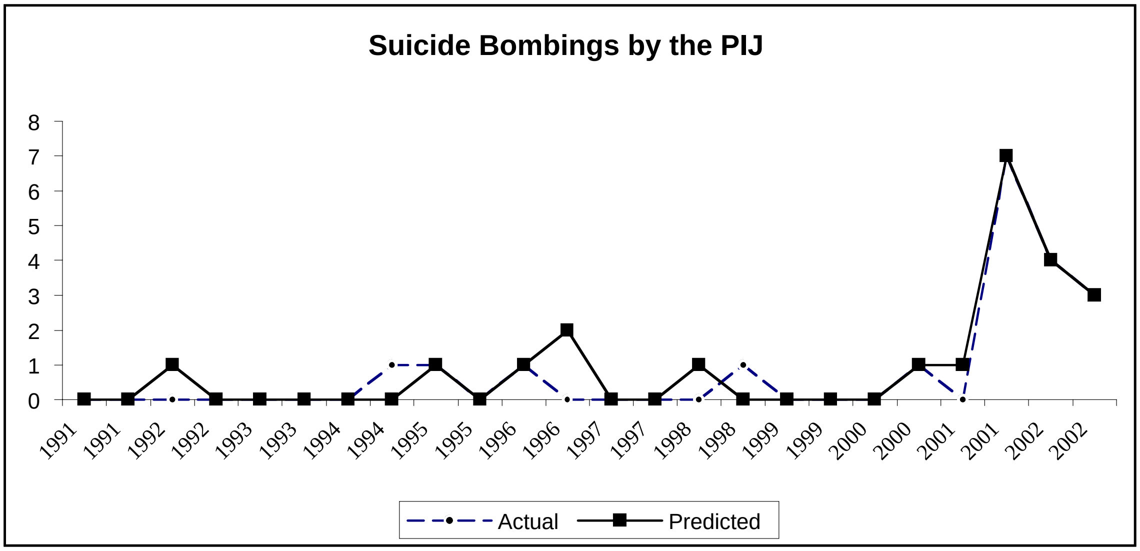


Table 5
Simulation results: Impacts on Incidents of Suicide Bombings (1991-2002)+

	Number of projected incidents Hamas	Number of projected incidents PIJ	Number of projected incidents Total	Hamas (% change)*	PIJ (% change)*	Total (% change)*
Israeli policy of coercion and retaliation						
Total kill	35	21	56	+10.2	-10.5	-3.4
Autoregressive (Hamas)	35	21	56	+10.3	-10.5	-3.4
Autoregressive (PIJ)	38	26	64	+2.6	-26.3	+10.3
Assassination of Engineer	30	15	45	-23.1	-21.05	-22.4
Assassination of Sqaqi	38	19	57	+2.6	0	-1.7
Destroying the middle ground						
Election	22	18	40	+43.6	+5.3	-31.0
Oslo peace process	33	23	56	+15.4	-21.0	-3.4
Rivalry and cooperation among the Palestinian groups						
Impact of Hamas on PIJ	39	3	42	0	+84.2	-27.6
Impact of PLOshoot on Hamas and PIJ	38	16	54	+2.6	-15.8	-6.9
External events						
Provocation	38	18	56	+2.6	+5.3	+3.5

+Actual number of total suicide attack incidents for Hamas is 39 and the PIJ is 19 during the study period.

* Percentage change is calculated by $\left(\frac{Actual - \Pr edicted}{Actual}\right) \times 100$