Hard Targets:
Theory and Evidence on Suicide Attacks*

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Abstract: Why suicide attacks? Though rebels often kill coreligionists, they seldom use suicide attacks to do so. Though rebels typically target poor countries, suicide attacks are just as likely to target rich democracies. Though many groups have grievances, suicide attacks are favored by the radical religious. We model the choice of tactics by rebels. We first ask what a suicide attacker would have to believe to be deemed rational. We then embed the attacker and other operatives in a club good model which emphasizes the function of voluntary religious organizations as providers of local public goods. The sacrifices which these groups demand solve a free-rider problem in the cooperative production of public goods, as in Iannaccone (1992). These sacrifices make clubs well suited for organizing suicide attacks where defection by operatives (including the attacker) endanger the entire organization. Thus radical religious groups can be effective dispatchers of suicide bombers if they chose to do so. The model also analyzes the choice of suicide attacks as a tactic, predicting that suicide will be used when targets are well protected and when damage is great. Those predictions are consistent with the patterns described above. The model has testable implications for tactic choice of terrorists and for damage achieved by different types of terrorists, which we find to be consistent with the data. The analysis has clear implications for economic policy to contain suicide terrorism.

Introduction

The suicide attack is a gruesome tactic of rebellion. Why would leaders of rebellions employ this tactic? Under what conditions will this tactic succeed? What kinds of rebels use it most effectively? Our answers, which will be developed over the course of the paper, are as follows. Where states are strong and their targets well-protected, rebel organizations cannot successfully use standard insurgency tactics. Under these conditions, suicide attacks can be effective. While recruitment of suicide attackers is not as difficult a problem as many surmise, the recruitment of such cadres who are resistant to defection is a first-order strategic problem. Radical religious organizations that demand sacrifices from their members that lower their outside wage opportunities, and in return provide social welfare benefits, are best able to protect themselves from defection. Our club model, which analyzes such organizations, helps explain apparently diverse patterns in the data on suicide attacks: that they take place in countries richer than the standard insurgency, that perpetrators and victims are often from different religions, that organizations with good social welfare programs are more effective killing operations, and that suicide attacks are more frequent the harder it is to reach the target and escape safely.

To develop our line of argument we draw on two literatures, one from the political science of insurgencies and one from economics of religion. In section 1, relying on a newly constructed dataset (described in the Appendix), we offer and provide evidence in support of two conjectures on the choice of suicide attacks as a tactic. These conjectures follow from the empirical work of Fearon and Laitin (2003). The first holds that the tactic of suicide attacks is used when conditions disfavor conventional insurgency, by which we mean attacks in which the attacker does not face certain death and sometimes faces little risk at all. The second holds that the tactic of suicide attacks is more likely to be chosen when the perpetrator and target are of different religions.

In section 2, we provide a theoretical foundation for both patterns. To do so, we first outline the beliefs that suicide attackers would need to hold for their actions to be deemed rational. We then place the suicide attacker in a rational choice framework that is consistent with the patterns identified in section 1. The model, relying on Iannaccone (1992) and Berman (2003), shows why "clubs" of a certain type (most easily formed through religious membership) are able to deal with defection well enough to organize a violent rebellion.

We then extend the model to examine how tactics vary across targets, formalizing the approach of Fearon and Laitin. Call a target "hard" if it cannot be attacked without a high probability of apprehension. We argue that as targets are hardened suicide attacks become an increasingly favored tactic as they have the great advantage of not allowing the attacker to be apprehended and exposing the other operatives. For hard enough targets this advantage outweighs the cost of losing a member (the attacker) with certainty. The extension therefore shows why suicide attacks are chosen when targets are well defended.

In section 3, we use the dataset introduced in section 1 to test several observable implications of our model, giving us added confidence in its explanatory power. One observable implication is that suicide attacks are more likely to be used against well-protected (hard) targets than against poorly-defended (soft) targets. A second is that organizations that have "club-like" features, namely those that supply social welfare benefits to members, are able to carry out suicide attacks more efficiently. This implication is strongly supported in data from Israel.

In section 4, our conclusion, we summarize our principal points. We also address two anomalies. First, for the Tamils in Sri Lanka, the case in our dataset with the second largest number of suicide attacks, although most of the attacks are inter-religious, the perpetrators are not, as we model, members of a radically religious club. We take this anomaly as an opportunity to explore an extension of our model that develops a different mechanism to account for suicide attacks. This mechanism is based on threats to kin if the chosen attacker refuses to serve the cause. The second anomaly is the tension between our prediction that our identification of the ideal operative is someone with low outside wage opportunities and recent findings suggesting that suicide attackers may be no poorer than their neighbors. We then suggest future empirical extensions that follow from the theory. At the end of section 4, we raise a policy implication of our model -- the higher the state-provided social security net, the greater the incentive to defect and so the harder are rebellions to sustain.

Section 1. Background and Conjectures

Insurgency

An insurgency is a technology of rebellion by guerilla warfare which has been very successful in surviving for decades in a large number of countries and in challenging regime domination in those countries. It has been hitched to a variety of ideologies: communism, nationalism, religious fanaticism, and in the case of the FARC (in Colombia), to no ideology at all! Since 1945, there have been 127 civil wars in 73 different countries, accounting for more than sixteen million deaths.[1] Many of these civil wars have relied upon the technology of rural insurgency.

The research of Fearon and Laitin (hereafter FL) shows that civil wars cannot be explained by: (a) level of grievances in the society or (b) degree of ethnic or religious difference or in fact any form of civilizational clash. Rather, they show that the best predictors of civil war are conditions favoring the success of the rural technology associated with insurgency: bad roads, rough terrain, poor state armies, lack of more remunerative employment for young men (as compared to being an insurgent), and weak

[1] . A civil war is a violent conflict between an organized militia and the armies of a state, in which there is contest for control over a region or the entire territory of the state. To qualify as a civil war, at least 1,000 deaths must be recorded as a direct result of the fighting. These deaths must be concentrated temporally close to its onset. And at least 10 percent of the deaths must be civilians or soldiers on the government's side. For a fuller description of criteria, see Fearon and Laitin (2003).

and new governments. Much of what these factors represent is captured in the per capita GDP variable, which dominates grievance (a ubiquitous condition in the world, but hardly one that can distinguish states highly susceptible to civil wars from those that are less susceptible) and civilizational variables in all the FL specifications.[2]

From this research they paint a portrait of an insurgent. The typical insurgent as theorized in their model is a poor person (with few alternative career paths than the insurgency), from an impoverished country (but not necessarily a backward region within that country, as internal migration possibilities from a poor to a rich region is an attractive alternative to insurgency). This country is likely to have a considerable swath of rough terrain not easily accessible by the armed forces of the state. Rough terrain is important for insurgency survival in part because of the inherent difficulty of the terrain, but is magnified in low GDP/capita countries, as GDP/capita is a good proxy for a weak state with a badly organized, low information army, an army that would not perform well under harsh conditions. Armies in poor states, for lack of reliable information, rely heavily on indiscriminate bombing that has the unintended effect of enriching the pool of potential recruits, thereby helping to sustain the insurgency. Recruits, in sum, are young men, unemployed, ill-educated, and therefore only remotely involved in grasping the ideological message of leadership.[3]

Suicide Attacks as a Tactic

Guerrilla warfare that sustains insurgencies encompasses a variety of tactics – most typically a network of self-sustaining rural militias that first intimidate populations and then govern those populations, thereby providing alternate sovereignty. Suicide attacks –in which the perpetrator of the attack will die with a probability of one if the attack is a success – are here interpreted as a tactic of rebellion that distinguishes itself from insurgency –in which the perpetrator has at least some chance of survival.[4] For example, we see Al-Qa'ida as involved (in large part) in a violent movement to overthrow the Saudi monarchy and other governments in Muslim countries, but one not relying on insurgency. Its suicide attacks in Tanzania, Kenya, Bali and the United States were not organized to overthrow those governments, but rather to recruit support for movements that would challenge regimes (such as the Saudi) not based on fundamental principles of Islam. In the case of the attacks on the US in September 2001, Al-Qa'ida was also seeking to reduce American military support for the Saudi regime. This

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[2] . David Laitin and James D. Fearon (2003) rely on two datasets: a revised MAR group/country dataset of over 400 minority/ethnic/religious/regional groups in over 100 countries; and a country/year data set of all countries of over 500,000 in every year since 1945. Replication data are available at their website: http://www.stanford.edu/group/ethnic/workingpapers/papers.htm].

[3] . See Jeremy Weinstein, dissertation in preparation at Harvard University, who shows greater variance in the degree to which insurgents are privy to the ideological message of their insurgency than suggested in this paragraph.

[4] The reader might wonder what these terms have to do with terrorism. Either tactic could be used in terrorist acts or in attacks with other aims. Besides terrorist acts suicide attacks have been used for political assassination such as the assassination of Rajiv Gandhi, and as attacks on military targets such as the Hizbullah car bombings of troops in Lebanon or the Kamikazi attacks on U.S. warships in the Pacific.

perspective interprets Hamas and other Palestinian militias as engaged in a rebellion with two goals: to establish sovereignty in part (or all) of what are today Israel and its occupied territories and additionally to control the government of an eventual Palestinian state.

Although an ancient tactic in inter-state warfare, suicide attacks are relatively rare. They were not used as a tactic of internal rebellion until 1983 when Hizbullah employed suicide attacks to challenge the Israeli occupation of Lebanon. The Liberation Tigers of Tamil Eelam (LTTE) in Sri Lanka followed suit with the second major series of suicide attacks taking place beginning in 1987 (in which they combined insurgency tactics with suicide attacks). Suicide attacks have been employed (at least twice) in civil wars in only seven of the sixty-nine countries that faced insurgencies in the past half century. Table 1 presents a list of those seven countries, and the three with only a single recorded attack.

Why is this tactic so rarely used by rebels? It is best to start with a profile of a suicide bomber as culled from the literature. The picture of a suicide terrorist appears to be quite distinct from the information available on a recruit in an insurgency.[5] Compared to a typical insurgent, the suicide bomber is more upscale economically, and more highly educated on average. (We surmise from this that he or she knows and relates to the ideological message of leadership, making grievances more consequential as a motivating force).[6] His or her country is richer, and along with its wealth it has a competent army. Unlike the hopeless economic conditions that are ideal for insurgency, suicide bombers have moderate employment opportunities outside of the rebellion. The country's terrain is more easily accessed by the state. Comparing the research on insurgencies with that on suicide attacks leads to the following conjecture:

C1: When insurgency is favored, suicide terrorism decreases in value; on the other hand, where insurgency is not favored, leaders need means alternate from standard insurgency tactics to succeed, and without a guerrilla force as a real threat, insurgents seek through spectacular heroic events demonstrating their tactical prowess and their commitment to the cause to gain advantage over a ruling regime.

The intuition here is simple.[7] Suicide bombing is a costly tactic, as it strips the insurgent organization of its human capital. It would be difficult if not impossible to recruit an impoverished young man who knows nothing about the ideals of the organization to volunteer for certain death. To be sure, as was apparently the case for the September 11, 2001 attacks, organizations can utilize ill-trained foot soldiers to support an operation that is led by adepts. And it is often the case that insurgent organizations can

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[5] . Krueger and Maleckova (2002). While the jury is still out on whether suicide attackers are more upscale than the average person in their society, we can be more confident in claiming that he or she is more highly educated than the typical member of a rural insurgency.

[6] . Insurgents are most likely to be male; suicide bombers draw from both genders.

[7] . Ronald Wintrobe (2003) offers a similar conjecture in discussing the demand side for terror, that is, why leaders would ask for such sacrifices among their closest followers.

recruit volunteers who individually paid the costs of ideological training as a by-product of their religious or civic participation. But for all leaders, whether paid for by the organization or not, ideological training appears necessary, and there are organizational opportunity costs to losing these highly motivated and well-versed members. If sustaining the insurgency were easy, such losses would be wasteful. This reasoning is in accord with Rosenthal's discussion of the use of *kamikaze* pilots by the Japanese in World War II, who reports that "these attacks began when the Japanese cause became desperate", that is, when the conditions favoring continued warfare against a superior opponent were rapidly worsening.[8] That is to say, faced with the choice of giving up or switching to a more expensive tactic, they choose the latter.

To test this conjecture, we took the FL dataset on insurgency onsets and added a column reflecting whether in that country/year there was a suicide attack by an organization from that country. Whether the act took place in the perpetrator's country or not, the suicide attack was assumed to be aimed at the state from which the perpetrator's organization came. The motives of suicide attackers are undoubtedly complex, surely variable among attackers, and in any case impossible to verify. But we hold it reasonable still to assume that at least part of the motive is to challenge the perpetrators' "home" government, even when the targets are external. For even if the attackers wish to destroy the foreign government whose civilians they have killed, the attackers surely disapprove of the fact that their home governments are not at war with, or are allied with, that foreign country. They are acting as international agents of their country because the principals are in their assessment illegitimate or lack resolve. With this assumption, we can compare the country/years in which civil war onset took place with those in which a suicide attack took place in order to see if civil war tactics are chosen in part as a consequence of the conditions that (dis)favor insurgency.

Table 2 compares the relationship of per-capita income with civil wars on the one hand and with suicide attacks on the other.[9] The bottom panel reports on countries currently experiencing civil wars, reporting the linear probability regression of a war indicator on GDP/capita (lagged one year, from the Penn World Tables) and an estimate of the proportion of mountainous terrain. GDP/capita has a consistently negative coefficient, both across countries and within countries over time (provided the regression is detrended). Doubling GDP/capita reduces the probability of suffering a civil war by 8-10 percentage points. The top panel, in contrast, shows that *GDP/capita predicts a small and statistically insignificant change in the number of annual suicide attacks*, both between countries and within countries over time (provided again that the regression is detrended). The cross sectional results also indicate that mountains are not a predictor of suicide attacks. Taken together, the regression results indicate that the while poor, mountainous countries are likely to suffer civil wars, they are no more likely to suffer suicide attacks than richer, flatter countries.

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[8] . Howard Rosenthal (this volume) "Suicide Bombing: What is the Answer?"

[9] . The Fearon/Laitin replication dataset ends in 1999. Yet many of the suicide missions reported in the ICT dataset are from 2000-2002. None of the results are qualitatively changed by adding the years 2000-2002 to the data and using GDP/capita in 1999 to proxy for current GDP/capita.

The *difficulty* of conducting an insurgency is therefore a condition favoring the use of a costly tactic such as suicide attacks. This helps explain Israel, the country that has suffered most acutely from 100 such attacks during the sample period. Israel is a developed, relatively flat, small country with a brilliantly equipped army that has invested heavily in information. The conditions for insurgency in Israel, given the FL model, are not propitious. Under these conditions, standard rural guerrilla tactics would fail. This makes the relative value of suicide attacks high.

In *C1*, the "spectacular heroic events" of suicide bombing are mentioned. The intuition behind this is that apparently inefficient tactics (killing few people and losing your own cadres) may pay off if the attacks serve the role of signaling sharply to the wider population the seriousness of the cause for which the insurgents are fighting. A high status person (for example, an educated Palestinian woman) would be hard to recruit for a standard thug-based insurgency, but may be more easily recruited to carry out a suicide attack.

C1, focusing on conditions unfavorable for insurgency as an incentive to employ suicide bombing, conditioned on there being an insurgent movement, has some interesting exceptions. There are several cases where insurgency is not favored, where rebel groups have nonetheless emerged, but where suicide attacks were not employed. These cases include South Africa (the ANC), Spain's Basque Country (ETA), Japan (Aum Shinrikyo), Italy (Red Brigades), and Germany (Baader Meinhof). These cases suggest a second conjecture.

C2: Where conditions do not favor insurgency, suicide attacks remain extraordinarily difficult to sustain. The conditions that help sustain suicide attacks remain to be specified, but religious difference between the perpetrators and the victims helps to fulfill at least one of the conditions.

As with the case of the *kamikaze* pilots (Shinto pilots and largely Christian victims), the suicide attacks were most often marked by a religious difference between the attackers and the victims. In Israel (Muslims vs. Jews), Sri Lanka (Hindus vs. Buddhists), Russia (Muslims vs. Eastern Orthodox Christians), and China (Muslims vs. Buddhists), religious difference marked perpetrator from victim. In the two cases from Saudi Arabia, although the forces of Al-Qa'ida seek to overthrow their co-religionists, their suicide attacks have been aimed against Christians. In Egypt, the suicide attack was by Muslim fundamentalists against the secular Muslims housed in the Egyptian embassy in Pakistan. While this does not support the conjecture, the argument about the importance of religion is not clearly undermined. Only the four cases perpetrated by the PKK (the Kurds) in Turkey are clearly disconfirming. But overall, 89.9 percent of the suicide attacks were aimed at victims whose religion was different from the attackers'. Table 3 presents data confirming this observable implication.

In contrast to suicide attacks, most insurgencies pit coreligionists against each other. In the FL data, only 16.5 percent of civil wars were fought between guerrillas made

up predominantly from one religious group against armies of the state who were largely of a different religious group. In three of these cases, suicide attacks were used: Sri Lanka, Russia (Chechnya), and China (Xinjiang). (Cases from the FL dataset in which insurgents and the state army were of different religions are listed on Table 4). Cases such as Nagorno-Karabakh in Azerbaijan, Srpska Republic in Bosnia, and rebellions in Nigeria, Philippines, Sudan, Cyprus and Bangladesh all pitted guerrilla armies against states that were led by people of a different religion. In these cases, however, the conditions favoring insurgency were better, lessening the need for the extreme tactic of suicide attacks. Only the case of the IRA in Northern Ireland do we see an example of low probability of insurgency along with religious difference, yet no suicide attacks. (This is the only case that meets the standards of *C1* and *C2*, yet for which there have been no suicide attacks).

If this conjecture proves to be correct, then the view that suicide attacks represent an outlier from the general conditions for insurgency is further confirmed. The FL model for insurgency finds no effect for religious differentiation. This conjecture suggests that only in the subset of rebellions where religious difference can be identified (or manufactured through relevant attacks on foreigners) will the tactic of suicide attacks be used. While the "civilizational divide" cannot explain insurgencies, it might account for the use of a particularly gruesome tactic in seeking to undermine state authority.

These conjectures and the evidence supporting them are provocative. Yet they have as yet little theoretical foundation, especially *C2.* While it might be easy to hypothesize that suicide attacks were a way for perpetrators to ensure eternal grace, a reward that would not come from killing co-religionists, it would then become a problem to explain the extraordinary degree of religious conviviality in the world when such great rewards are available for killing one's neighbor (albeit of a different religion). To be sure, there is careful work in the social sciences, most notably in psychology, political science and economics that has theorized about the questions that motivate this paper. Ariel Merari, a psychologist at Tel Aviv University who has published extensively on suicide terror, has written on the individual predispositions that motivate suicidal terrorists (Merari 1990). Recently, he reported to journalists that suicide-bombers undergo "psychological indoctrination, intended to motivate them to move past 'the point of no return'".[10] Over the past decade, however, as shown by Kruglanski (this volume), psychologists have recognized that social and organizational factors must be brought into play, but without as yet a compelling theory of how glory and indoctrination can overcome the instinct to live.

Robert Pape, a political scientist at the University of Chicago, emphasizes the strategic logic of suicide terrorism, and the conditions under which a campaign of suicide attacks can coerce a target government to change its policies. The tactic is used by the weaker party and generally in a conflict over self-determination for a defined nation in a country. The goal is to cause sufficient damage and the expectation of future damage through the bundling of attacks into campaigns, to compel the stronger party to relent in

[10] . See: http://www.freedom.org.uk/mag/issuea18/page12.htm

its unwillingness to grant the terrorists their goals. Furthermore, since democracies are said to be weak in the face of coercion (and suicide attacks harder to organize in authoritarian states) this tactic is used primarily against democracies. In sum, suicide terrorism is growing in use against democratic targets because terrorists have learned that even if there are limits to how much can be achieved, "suicide terrorism pays" (Pape 1993, 355). Pape's paper goes a long way in helping to show the rationality of this form of martyrdom, especially in showing how it is a tactic of insurgents in very weak strategic situations vis-à-vis the state they are fighting. Yet it leaves several unanswered questions. First, if religion plays such a small role in driving strategy, what accounts for the data (Table 4) showing that religious difference between perpetrator and target in suicide attacks than in the average insurgency? Second, even if terrorism pays for insurgent organizations, how can they recruit individual martyrs?

Ronald Wintrobe, an economist at University of Western Ontario, has proposed that suicide bombers are merely extreme cases of individuals giving up individual beliefs in order to enjoy social solidarity. While much can be said for rational models of terrorism (and we present our own), up till now such models have left much to be explained. For example, why would leaders of terrorist organizations sacrifice their potentially best cadres – i.e. those who believe most strongly in the cause, and therefore willing to volunteer for such missions – for suicide attacks. The organizational costs (in loss of devoted personnel) only add to the nearly unthinkable individual costs of suicide bombing.

In the section that follows, building especially on Pape and Wintrobe, we attempt a theoretical framework that makes sense of the patterns discussed above, a framework that will have observable implications that can be tested with the datasets already described.

Section 2. Rational Martyrs and Terrorist Clubs: A Framework

Rational Martyrs[11]

A first step in adopting a rational choice approach is to point out that there is no tension, in a technical sense, between rationality and suicide. Much of the terror generated by suicide attacks comes from the idea of an army of suicidal drones so dedicated to their cause that they would willingly give up their lives for it. In response to this interpretive frame, rational choice theory has sought to show that suicide attackers might well be maximizing a reasonable set of goals. Such goals include performing the ultimate sacrifice to enhance the possibility of reward in the hereafter, or perhaps to improve the lives of their families and compatriots.

According to these rational choice models, there is nothing irrational about a calculated suicide, given either: a) a belief in the hereafter combined with a belief that the

[11] This discussion owes most of its content to a conversation with Larry Iannaccone.

suicidal act will be rewarded in the hereafter, or b) altruism towards family or compatriots combined with the belief that the suicidal act will enhance their lives.

A given population is likely to hold at least some people who satisfy these conditions. Most Americans, for example, believe in heaven and most of those believers anticipate enjoying it (Iannacconne 1998). What separates radical Islam from mainstream Islam is the belief that an act which is suicidal and kills civilians could be divinely rewarded. This interpretation of Islam dates back only to Sayyid Qutb's writings in Egypt from the 1950s. Qutb developed the concept of sacred jihad as an offensive rather than a defensive act (Bergen 2002, 51). Mainstream Islam, like its theological cousins Christianity and Judaism, sanctifies human life.[12]

Altruism may apply to both religious and secular terrorists. We often see altruism among families and friends and even among strangers. Examples range from ordinary, anonymous charity, to extreme and selfless acts of heroism like those of the firefighters and police of September 11th. Those acts indicate a high sense of altruism for others, combined with a feeling that the welfare of others will truly be improved by the act. In the case of suicide attacks, not only is a high sense of altruism for others required, but probably also an exaggerated belief in the social benefit of a successful attack. For instance, the September 11th terrorists may have believed that their act would help topple the Saudi government. Or a *Hamas* suicide bomber might believe that a single destructive act would make some significant contribution to creating an Islamic state in Palestine. These beliefs seem to stretch credulity but are fairly common as biases that overvalue the potential role of the decision-maker in affecting change (Jervis 1976).

Particular combinations of beliefs are necessary and they could well be latent in the population with no particular need for indoctrination. Amira Hass (Haaretz, July 16, 2002) reports on a discussion with secular and religious Palestinians in Gaza, including *Hamas* activists, in which all these opinions and more were expressed. Jasso and Meyersson (this volume) report that support for violent rebellion cuts across gender and education categories (though income reduces support for violence among men). In the West Bank and Gaza during the period preceding the first *Intifada* there are many indications of latent beliefs that would come close to triggering suicide. These ranged from teenagers provoking soldiers to fire by throwing rocks at their heads, to stabbing attacks on armed soldiers in which the risk of death for the attacker was extremely high. These acts were reportedly spontaneous (Sprinzak, 2000).

Standard accounts of suicide attacks suggest that the combination of beliefs necessary for a rational martyr is not so very unlikely. While we lack estimates of the incidence of different beliefs, the key fact is that only a very small proportion of the population need be committed enough believers if an organization exists which can identify and recruit a small number of suicide attackers, the resulting violence can be devastating. So, despite a popular wisdom that indoctrination is important, it may not be

[12] Clearly neither Christianity nor Judaism has always consistently extended that sanctity to civilians of other religions. For example, Samson, who clearly targeted civilians, is memorialized as a martyr by both Jews and Christians.

as critical as often portrayed. Iannaccone (this volume) points out that despite conventional wisdom about "brainwashing," careful research revealed that indoctrination played only a minor role in recruitment to U.S. sects. That is, following from these rational choice accounts, it may not be an unusual problem to find volunteers who prefer martyrdom to life, even without indoctrination. The real problem might be recruiting a *reliable* martyr. We account for why radical religious groups might have a strategic advantage in this regard.

Terrorist Clubs: Radical Religious Groups as Social Service Provision Clubs

Critical to our understanding of the role of Radical Islam in organizing armed rebellions is the recognition that these communities, like other religious sects, are commonly engaged in cooperative production of another sort: mutual insurance activity. Consider the following puzzle for the rational choice approach: Religious sects prohibit common pleasurable behaviors and require sacrifices. Recruits must obey rules regarding diet, prayer, dress, hair, sexual practice, relations to constituted authority, and marital fidelity. Sacrifices are irreversible destruction of resources, such as burnt offerings. In the recent history of European Jewry, a circumcision irreversibly labeled a child as Jewish, an act that might put his life at risk by destroying the option of pretending to be a gentile. A vow of fidelity or abstinence is also a form of sacrifice, since it represents a permanent restriction of activities. Years of volunteer activity required of Mormons can be though of as a sacrifice of time, especially considering the foregone opportunity to accumulate human capital. Years of study in a religious institution represent a sacrifice of the alternative potential use of that time, be it in accumulation of human capital in secular studies or in accumulation of earnings.

Limiting choices and destroying resources are puzzles for an economist, yet people voluntarily join groups that enforce prohibitions and require sacrifices.[13] These groups stubbornly defy price theory, persisting in time-intensive activities like communal worship, Sabbath observance and dietary restrictions despite the historical increase in the shadow price of time. Strict sects show no sign of disappearing and those with the most demanding practices seem to be growing fastest.[14] The modern Anabaptist traditions (such as the Amish, Mennonites and Hutterites) are holding their own while Ultra-Orthodox[15] Jewry, and Radical Islam are thriving, despite a multitude of time intensive requirements.

Iannaccone (1992) pointed out the puzzle of prohibitions and sacrifices and offered a creative solution within standard economic theory, proposing that they are efficient institutions in the context of an economic club which provides services to members through cooperative production. This section presents a simplified version of

[13] For a quasi-rational choice alternative to ours, see Elster (1984).

[14] Iannaccone (1998) describes the growth of conservative sects worldwide (p. 1471).

[15] Revealingly, the Hebrew term for Ultra-Orthodox, *Haredi*, literally means "shaker" impling trembling before the Almighty, the same way the Shakers used the term.

his rationalization of religious sacrifices and extends the argument to cover militia activity as in Berman (2003). The following section discusses the choice of suicide attacks as a tactic of violent rebellion.

Clubs

A social interaction model offers an explanation for sacrifices. Group members derive utility from (secular) consumption, S, and from time spent in religious activities, R, such as prayer and community service. They also gain utility from the level of a local public good A.

$$(1) \qquad U_i = U(S_i, R_i, A) \qquad \text{for } i = 1 \text{ to } N \text{ members,}$$
$$U_1, U_2, U_3 > 0,\ U_{11},\ U_{22},\ U_{33} < 0 .$$

Good A is nonrival and excludable, making it a *club good*. Members get A from either a government, G, or the "club," C, which uses hours of religious activity as an input. Public safety is an example of a pure public good which could be provided by government or by a club, perhaps as a religious obligation. Welfare services, schools, hospitals and mutual insurance are examples of excludable, partially rival activities commonly provided by religious communities.

$$(2) \qquad A = G + C(\{R_i\}),\ \frac{\partial C}{\partial R_i} > 0 \quad \text{for all } i.$$

Members maximize utility subject to time and budget constraints. A fixed allocation of time, T, is split between the religious activity, R, and work hours, H, so that $R_i = T - H_i$. Income is earned from wages w and spent on consumption of the secular good, S, at price p, so that

$$(3) \quad pS_i = wH_i = w(T-R_i) .$$

A key point is that the club good C is produced by voluntary donation of time by members.[16] A critical point is that these donations of time are extremely difficult to monitor, since they are largely informal acts of charity. Thus a free-rider problem arises. Yet, such donations are extremely common in religious sects. Since this voluntary activity generates positive externalities they should be subsidized by the club, a point pursued in Iannaccone (1992) in explaining religious prohibitions on activity outside the club as a second best form of subsidy. [17]

[16] Note that the local public good is created by donating time rather than money. This is critical to the analysis and consistent with the nature of religious sects (Iannaccone, 1992; Berman 2000). A possible explanation is that people with high wage opportunities find it more efficient to buy insurance and other social services in the market, a point that will be clearer after the discussion of rational sacrifices below.

[17] Externalities imply that a competitive equilibrium will result in too little religious activity R. That inefficient competitive equilibrium creates an incentive for clubs to tax the market time of members in order to induce them to spend more time on religious activity. Iannaccone (1992) explains how religious prohibitions can be rationalized as an effective tax which increases welfare of club members.

Efficient Sacrifice

Sacrifices are critical to understanding rebel organizations. Sacrifices are acts which irreversibly destroy value, such as circumcision, burnt offerings, and ritual bloodletting. They can be explained as an initiation rite which signals type (Camerer 1988, Iannaccone 1992).

To see how the model[18] explains sacrifices, augment it with unobserved heterogeneity in the form of high wage (type 2) and low wage (type 1) individuals. High wage individuals choose less religious activity (in the upward sloping part of a labor supply curve) as it is relatively more expensive for them, i.e., $R^2 < R^1$ (Heterogeneity could alternatively be in preference for religious activities at the margin. Heterogeneity in wages is chosen mainly to simplify the exposition.) Assume that the value of the benign club good is given by the average of R, as would plausibly be the case in a mutual insurance club, where the average donation of time by members to mutual aid would matter.

$$(4) \qquad C(\{R_i\}) = C(\overline{R}), \quad \overline{R} = \sum_{i=1}^{N} R_i / N$$

High wage - low R individuals are potential "free-riders." They would like to join the high R club and benefit from their high average level of religious activity. Members of the high R (low wage) club would rather not admit the high wage types, as the reduction in the average level of religious activity will reduce club quality. Since access to the externality is excludable, the high R (low wage) group can rid their club of free riders by requiring a costly initiation rite, or *sacrifice*, which will successfully exclude low R (high wage) individuals from joining, keeping C high, at $C=R^1$. Unlike religious activity, R, the sacrifice benefits no one except through its role as a signal. Potential applicants must reveal their type, which is otherwise unobservable, when they make a decision to sacrifice, or not to sacrifice, time.

A sacrifice inducing only low wage types to sacrifice can be shown to be a separating equilibrium.[19] This setup is analogous to other forms of costly sacrifices which signal type, such as initiation rites in the military, hazing in fraternities, Spence signaling in schooling, or frivolous engagement gifts.[20]

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[18] This is a simplified form of Iannaccone's (1992) model.

[19] For a proof see Iannaccone (1992). For a formal derivation of the optimal sacrifice and a graphical explanation see Berman (2000).

[20] Beyond rationalizing puzzles such as engagement rings, this view of a religious sect as a social service provision club has testable implications. For instance, the stronger the sacrifice demanded of members, the higher the average level of voluntary religious activity and the greater the degree of mutual insurance. That implication is confirmed in Iannaccone's (1992) study of Christian denominations and supported casually in Berman's (2000) discussion of Ultra-Orthodox Jews. Among Muslims at least some radical sects are active at social service provision, including the *Hamas,* the *Hizbullah* and the Islamic Brotherhood in Egypt [Mishal and Sela (2000), Munson (2002)]. Other testable implications of the club approach to religion are supported by evidence on Ultra-Orthodox Jews (Berman 2000) and Indonesian Islamists (Chen 2003).

Recruiting

In the last section we argued that recruiting is not as difficult for rational choice models as would initially appear. The problem is in getting the right type. Therefore, in this section we have argued that radical religious sects use sacrifices as signals of commitment to sort prospective members on their unobserved attributes. Combining those two insights, radical religious sects should have an advantage in recruiting suicide attackers if they can design signals of commitment that will distinguish members who have the "right" beliefs from those who will pull out or even defect. That argument is strengthened by examining how sensitive a cell of violent rebels is to defection, either by the attacker or by the other operatives.

The Production Function of Suicide Attacks

Violent rebels such as guerrillas and terrorists are extremely sensitive to defection. Consider the logistics of organizing a suicide attack on some target where the potential victim can induce defection at any stage, from planning through the attack. There must be enough operatives involved to recruit a suicide attacker, train that attacker, record a video, observe the attacker to be sure his or her resolve does not waver, procure explosives, identify a target, send the attacker on their way and then make a public announcement taking credit. Assume that N operatives are required, excluding the attacker. Each has some nonrival benefit B from a successful attack.

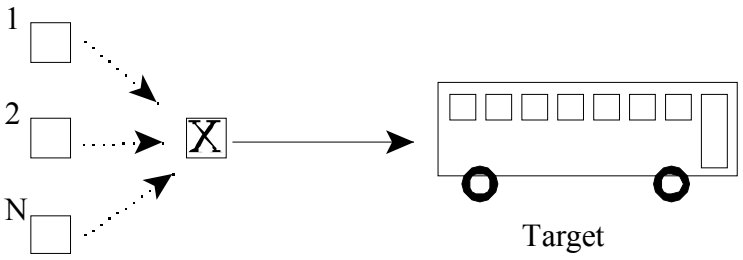

Figure 1: Operatives and Target

Any one of those N operatives, including planners, has enough information to defect, destroy the operation, and collect a reward from the other side by simply making a phone call. Defection is not uncommon. Of the 189 Palestinian suicide attacks attempted between September 2000 and April 2003, fully 77 were prevented before the attacker detonated himself, presumably because someone provided information or defected (IDF figures, reported by Zeev Schiff, *HaAretz*, May 3, 2003). Sometimes the information may come from friends and family. (Although it is often noted that taped interviews with

parents show great support for the heroic deeds of their children, these interviews are conducted *after* the attack. Parents apparently seldom know beforehand, perhaps because they would have a powerful incentive to inform or induce defection).

Formally, we could think of this conspiracy as joint production. Each operative makes a binary choice of *R=1 (loyalty) or R=0 (defection).* Together they produce a good

$$\textbf{(5)} \qquad B(\{Ri\}) = B(\prod_{i=1}^{N} Ri),$$

where *B(1)* is the value of a "successful" attack and *B(0)* is that of a failure, so that *B(1) > B(0)*. Assume that membership in this group is exclusive. That, and the fact that the benefits of success are shared in a nonrival manner among members (in prestige, political power, deterrence of an enemy), make it formally a club good.

Why would an operative defect? Well, the victims' side would be willing to pay a sum up to the value of damage inflicted, including both the direct effect of the damage and the indirect effect of a terrorized population. Call that amount *D.* (This may be a negative-sum activity as the replacement value of the damage to the victim, *D*, may far exceed the value to operatives, *B,* so that *B<D*, even if *B(D)* is an increasing function.)

Assume also that operatives have income from some outside sponsor (who values successful attacks). That income is small but proportional to damage *D, "D*, where *0< "<1*. Assume for simplicity that a defector can extract the entire surplus, *D*, from the potential victim *D.*[21]

Now consider the payoffs of members of a club providing both benign local public goods and the violent result of an attack, using the utility function in equation (1). (I.e., operatives are club members.) An operative who remains *loyal* enjoys utility

$$U(\frac{\alpha D}{N}, 1, G+B(1)+C(\overline{R}))$$

where the first term is the payment from the outside sponsor split among N operatives which each consumes. The second term indicates whatever personal satisfaction comes from remaining loyal. The third reflects the augmented public good available to a loyal operative, the sum of whatever the government provides, *G*, the benefit of a successful operation *B,* and the value of the benign club good *C.* A member who *defects* (assuming that the club is organized well enough to identify defectors with a high probability of success) will be expelled from the community, receiving utility

[21] We assume away the serious moral hazard problem faced by potential victims attempting to bribe club members into defecting. How would the potential victim know that someone claiming to be a defector was really planning to do any damage at all? That uncertainty prevents efficient Coasian bargaining, yet the fact that leaks occur and defection takes place indicates that defectors find some way of establishing credibility. The results below require only that the bribe offered to defector be proportional to D in some proportion greater than ".

$U(D+w_i, 0, G)$

He consumes the damage value *D* paid by the potential victim in addition to his outside wage w_i , gets no satisfaction from doing his duty, and receives only the public good that the government provides. In all, each operative faces incentive compatibility constraint

(6) $U(\frac{\alpha D}{N}, 1, G+B(1)+C(\overline{R})) \geq U(D+w_i, 0, G)$

If that constraint fails for any of the *N* operatives, then the operation fails and they are all likely exposed.

We have so far avoided discussing the defection decision of the suicide attacker. Formally, his (or her) incentive compatibility constraint would look like (6) above but with two changes. First, it would be augmented with terms reflecting altruism or the hereafter, as discussed above. Second, the left hand side reflecting utility in the present would be omitted. If the club has successfully recruited a member who will not defect under any conditions, only equation (6) is relevant. If not, a condition similar to incentive compatibility could be added but it complicates the analysis without adding insight.

Equation (6) implies that clubs with the ability to screen out high wage operatives will have an advantage in such conspiracies.[22] Consider heterogeneity in outside options, *w*, as above. Assume parameters are such that operatives with good outside options will defect while low wage types will not, (i.e., there is some cutoff wage *w'* below which (6) will hold and $w^L < w' < w^H$). A club with the capacity to extract signals of commitment (low wages) can successfully exclude those high wage applicants who haven't demonstrated organizational commitment. These groups can implement a suicide attack while other prospective terrorist groups cannot.

Examination of (6) reveals why clubs put operatives with strong outside options (i.e. high w) under special scrutiny –they are more likely to defect. To be trusted, high wage operatives would need to compensate by making credible claims to organizational loyalty (e.g. that agents of the state murdered the claimant's brother or raped his/her sister). Thus high-wage recruits who pass the loyalty test should prefer to volunteer in low-wage high-sacrifice organizations to protect themselves from defection.

We have already discussed informally the advantage that a religious sect operating a social service provision club would have at recruiting suicide attackers. Examining equation (6) strengthens that argument, showing that the ability to select on w_i allows a terrorist organization to retain incentive compatibility. Another implication is that (for most parameter values) the stronger the social service provision network of a radical religious group (C), the larger the targets it can afford to attack (D). We test that implication in the next section.

[22] These two paragraphs repeat an argument made in Berman (2003).

Suicide Attacks

To analyze when suicide bombing is chosen as a tactic we expand the model to include the possibility of apprehension. The discussion above emphasizes the sensitivity of terrorist organizations to exposure. Let p be the probability that the attacker is apprehended, exposing the operatives. Apprehension is far more dangerous for the organization than the attacker dying because an interrogated attacker exposes the other operatives. Assume for simplicity that apprehension implies both a failed attack and capture or death for all the operatives, which we treat as setting utility to zero for operatives.

Now allow the organizational leadership two tactics, denoted by F, *(0,1),* where one indicates a suicide attack and zero a conventional attack. In a suicide attack the probability of the attacker surviving is small, while in a conventional attack the attacker is much more likely to survive. Apprehension probability is a function of the method of attack and the inherent "hardness" of the target,

$$p(F, h).$$

Since survival is unlikely, so is apprehension. We therefore assume that $0 = p(1,h) < p(0,h)$ *for all h.* The difficulty, or "hardness," of the target is denoted by the real number h, which represents a combination of defensive measures by the target (or its government) and topography (as in Fearon and Latin (2003)). We assume that $p(0, h)$ increases in h in the [0,1] interval. Suicide attacks are less dangerous for the operatives (other than the attacker) but require them to lose a member and compensate the bereaved family, which we represent as a public bad Z lost in a nonrival way by operatives.

Apprehension probability and a choice of tactics change incentives for operatives, allowing them three choices, suicide attack, conventional attack, or defection. Assume that the operatives have chosen a target of given difficulty, h, and that they have a willing suicide attacker. They then choose between:

(7a) the utility of an operative from a suicide attack --

$$U\left(\frac{aD}{N}, 1, G + B(1) + C(\overline{R}) - Z\right)$$

(7b) the expected utility of an operative from a conventional attack –

$$[1 - p(\sigma = 0, h)] \quad U\left(\frac{aD}{N}, 1, G + B(1) + C(\overline{R})\right)$$

(7c) the utility of an operative from defecting --

$$U(D + w_t, 0, G)$$

These choices are illustrated in Figure 2, which graphs utility of operatives against the damage done to victims for possible parameters. The steepest line is the utility gained by defecting (7c). It increases most quickly in D because the full value of D is available to induce operatives to defect. It begins at a low level, for low D, because defectors draw no local public goods (B or C) from the club. Thus defection is

unattractive for low levels of damage, *D*.

For targets with a low probability of apprehension the utility-maximizing choice is the conventional attack (7b), illustrated by the top line. Utility for loyal operatives using the conventional attack is high even at low D because they benefit from club goods B and C. It increases slowly in D because the subsidy is only "D and is split among N operatives, and because expected utility is decreased by the probability of apprehension *p*. In the illustration the conventional attack is preferred over defection when *p* is low for targets ranging in size from 0 to D_A. For $D>D_A$ defection would occur as utility from defection exceeds that for loyalty.

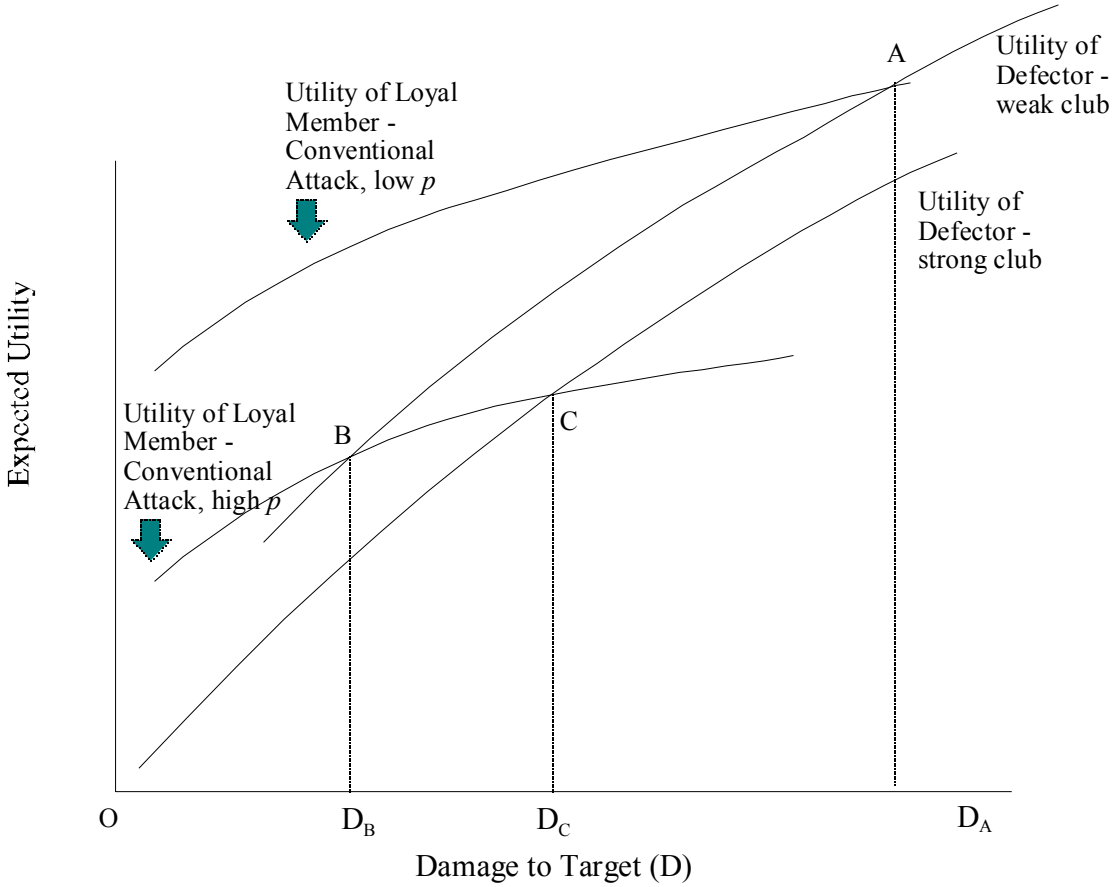

Figure 2: Apprehension probability, clubs, and damage

The key point of the diagram is that as the probability of apprehension, *p* , increases, expected utility falls. In Figure 2 that is illustrated by the downward shift in the expected utility of a loyal operative. With high *p* the conventional attack is incentive compatible only for a smaller range of targets (0, D_B). This is how the model captures the results of FL for insurgencies: topography, strong government and other environmental factors that raise *p* will limit the targets that an insurgency can aspire to attack without operatives defecting. Thus one reason why insurgency decreases as GDP/capita rises is that government resources invested in apprehension will "harden" targets, limiting insurgencies to low damage activity.

Figure 2 also illustrates how clubs and apprehension probability interact. The discussion of points A and B were for a weak club. Consider now a "strong" club with the ability to restrict membership to individuals with low outside options. The utility of operatives defecting from that strong club is lower because their outside options are worse. Because of these low outside options, defection will begin to occur not at point B but at point C, allowing targets to be attacked in the larger $(0,D_C)$ interval.

Now consider the suicide bombing option in equation (7a). At high probability of apprehension the suicide attack becomes relevant. The reason is illustrated in Figure 3: Since the suicide attacker cannot be apprehended the tactic is insensitive to increases in apprehension probability. Consider the case of a high *p* and a strong club. The utility for a operative is relatively low for the suicide-bombing tactic at low damage because of the loss of the attacker *(-Z)*. Yet expected utility increases more quickly in damage for the suicide attack than for the conventional attack because the probability of apprehension affects only the conventional attack. So to the right of the point labeled D (for targets with damage greater than D_D) suicide attacks are preferred to insurgent attacks.[23]

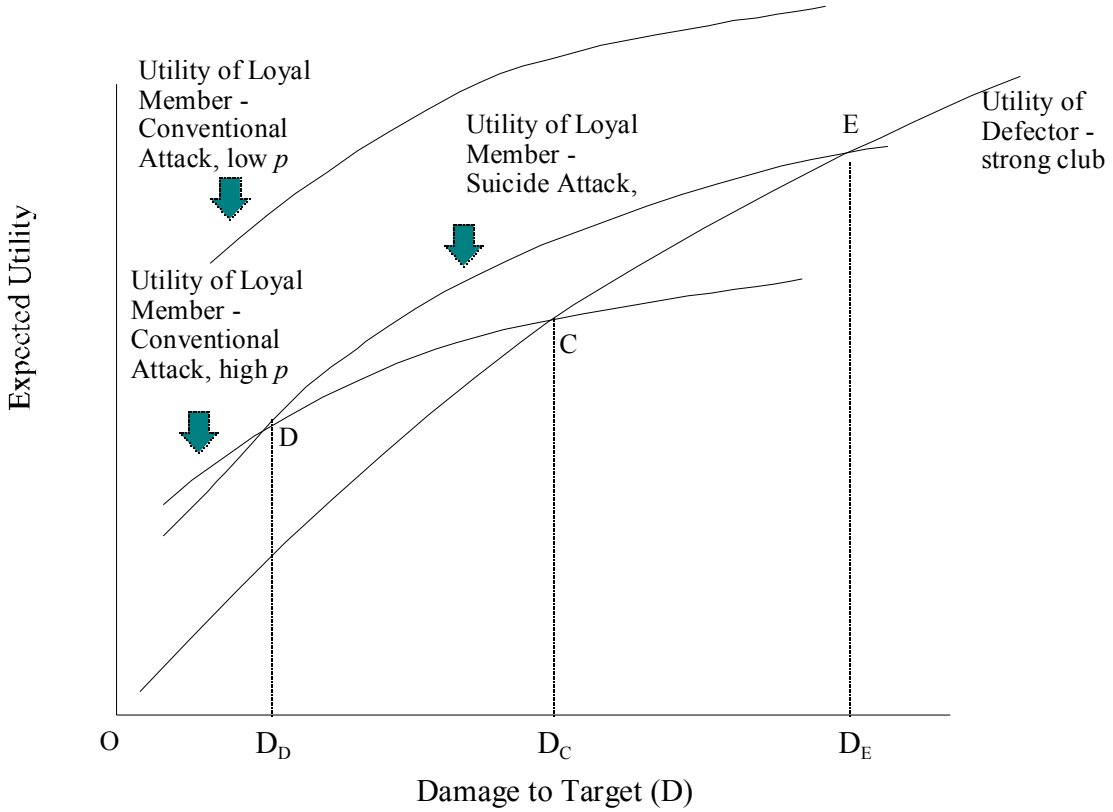

Figure 3: Suicide Attacks, Conventional Attacks, and Damage

[23] . Note that in equilibrium *D* may be higher in conventional attacks if computed in a loss-of-life algorithm But we compare *D* in market terms, i.e. how much state authorities would pay to prevent such an attack..

Tactic Choice

Note that Figure 3 illustrates a formal version of the discussion in Section 1. At low probability of apprehension, the reduction in apprehension risk is not sufficient to compensate for the high cost to the community of losing a member, so suicide attacks are disfavored. This may explain the finding of Tables 1 and 2, that suicide attacks are rare, and virtually absent in poor countries where the probability of apprehension for a terrorist attack is small (see also Krueger and Laitin, this volume).

The analysis also encapsulates part of conjecture C1: Suicide attacks are favored when apprehension probabilities are high. That high apprehension probability could be for the two reasons emphasized by FL: topography that makes apprehension likely or a government strong enough and well enough funded to allocate resources to defending targets. That would explain the first finding in Table 2: If we think of GDP/capita as a proxy for expenditure on apprehension probability then we find that unlike conventional insurgencies, which decline significantly in GDP/capita, suicide bombings are unaffected by GDP/capita, given that they hardly occur at all in poor countries. The model is consistent with that outcome, predicting that as defensive expenditures increase, the utility from a conventional attack shifts downwards so that the interval (D_D, D_E) of incentive compatible targets widens.

Coreligionists are Soft Targets

The analysis illustrated in Figure 3 provides an explanation for the striking results of Tables 3 and 4. Those two tables showed that on the one hand insurgencies generally attack coreligionists (83.5% of attacks), yet suicide bombing was much less likely to be used on coreligionists (only 11.1% of suicide attacks).

Coreligionists are soft targets. The typical problem in defending ("hardening") a crowded target is that it is unfeasible to screen all individuals with access to the target for every possible weapon. The solution is generally to predict which individuals are at the highest risk of harboring violent intentions (by "profiling") and then to screen those individuals carefully. That method raises the probability of apprehension, before the attack or at least after it. Yet coreligionists are typically similar in appearance, making profiling extremely difficult. [24]

In fact, in the few prominent cases where we do see suicide attacks on coreligionists, they tend to be against very well defended targets, where the mechanism of defense went beyond profiling. That would be the case in the assassination of Egyptian President Anwar Sadat by the Egyptian Islamic Jihad, which was essentially suicidal, or

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[24] . This might explain the anomaly of Northern Ireland discussed in section 1, where suicide attacks are *not* used, even against members of the other religion. Diego Gambetta (personal communication, October 21, 2003) reports on research showing the strategic mimicking of identities so that potential targets of terror avoid identification as either Protestant or Catholic. These strategies make profiling more difficult.

in the assassination of Northern Alliance leader Ahmad Shah Masood by Al–Qa'ida suicide bombers disguised as journalists (Rashid 2002, p. 87). In both those cases the attackers overcame any theological objections to killing Muslims, but may have chosen the suicide tactic because they faced targets for which the probability of apprehension in a conventional attack was close to one. Similarly with the LTTE assassination of Rajiv Gandhi on May 21, 1991, in which a Hindu killed a Hindu. As the favorite to win election as Prime Minister of India, he was an extraordinarily well defended target.

Section 3. Testing the Extended Club Model of Terrorism

The extended club model of terrorist organizations presented above was motivated by the literature on insurgencies and the data on choice of tactics. A model that stresses the incentive compatibility of potential defectors is capable of explaining the findings in Tables 1-4: suicide attacks are rare; they are used against relatively wealthy targets and they are rarely used against coreligionists.

Our intuition is straightforward. Conventional terrorism is less expensive in human lives to the perpetrators so it is preferred when the probability of apprehension is low, or when the target is small enough to not be worth the loss of an attacker. When apprehension becomes likely suicide attacks are preferred because an attacker who commits suicide will not be apprehended and expose the network. When targets are very large defection becomes a constraint, so that clubs that have an advantage in choosing operatives unlikely to defect will engage in more large-target attacks, for which suicide attacks are the preferred tactic. We now turn to testable implications of that analysis.

Our first prediction is that suicide attacks are used disproportionately against hard targets. By hard we mean that the probability of apprehension is high using a conventional attack technology. The Israeli situation provides an environment to test this hypothesis: Palestinian insurgents in the West Bank and Gaza have a large choice of soft targets locally. Settlers and soldiers use roads that pass through heavily populated areas or through terrain that is easily attacked because of topography. Settlements and military locations are also quite exposed and in proximity to large Palestinian populations. The result is that an attacker can fire a weapon or detonate a bomb remotely in such a way that makes escape relatively easy afterwards, and can then blend into the local population. In contrast, targets on the Israeli side of the "green" line are much "harder," posing much greater risks for the attacker. To reach the target requires passing through checkpoints and perhaps a security fence at which his weapon could be discovered. Once on the Israeli side, security forces and civilians can profile the attacker based on appearance. After an attack the attacker faces a heightened version of all those risks on the way back to some hiding place.

Applying the analysis of Figure 3 to the Israeli case, we would predict that attacks within Israel are much more likely to use the suicide tactic, as these are "hard" targets, while attacks in the West Bank and Gaza are more likely to use conventional tactics. Table 5 reports data on attacks and fatalities by location and method for the period from

the beginning of the second *intifada* (September 2000) through July 2003. Attacks include all forms of violence toward Israelis and residents of Israel as recorded by the IDF, including suicide attacks but also shootings, roadside bombs, stone throwing and other tactics. The vast majority of recorded attacks are in the West Bank and Gaza (96%). The next column records fatalities due to attacks, which indicates that the majority of fatalities (60%) are on the Israeli side of the green line. While there is no direct information here about choice of methods, the methods used on the Israeli side of the green line are clearly deadlier.

Conditional on fatalities one can compare method by location. Suicide attacks killed eight people in the West Bank and Gaza while killing 401 on the Israeli side of the green line. That is to say, 17,405 attacks in the West Bank and Gaza resulted in eight deaths due to suicide attacks while 730 attacks on the Israeli side of the green line resulted in 401 deaths due to suicide attacks. The data show that suicide attacks are disproportionately used against the relatively "hard" targets on the Israeli side of the green line, as predicted by the model.

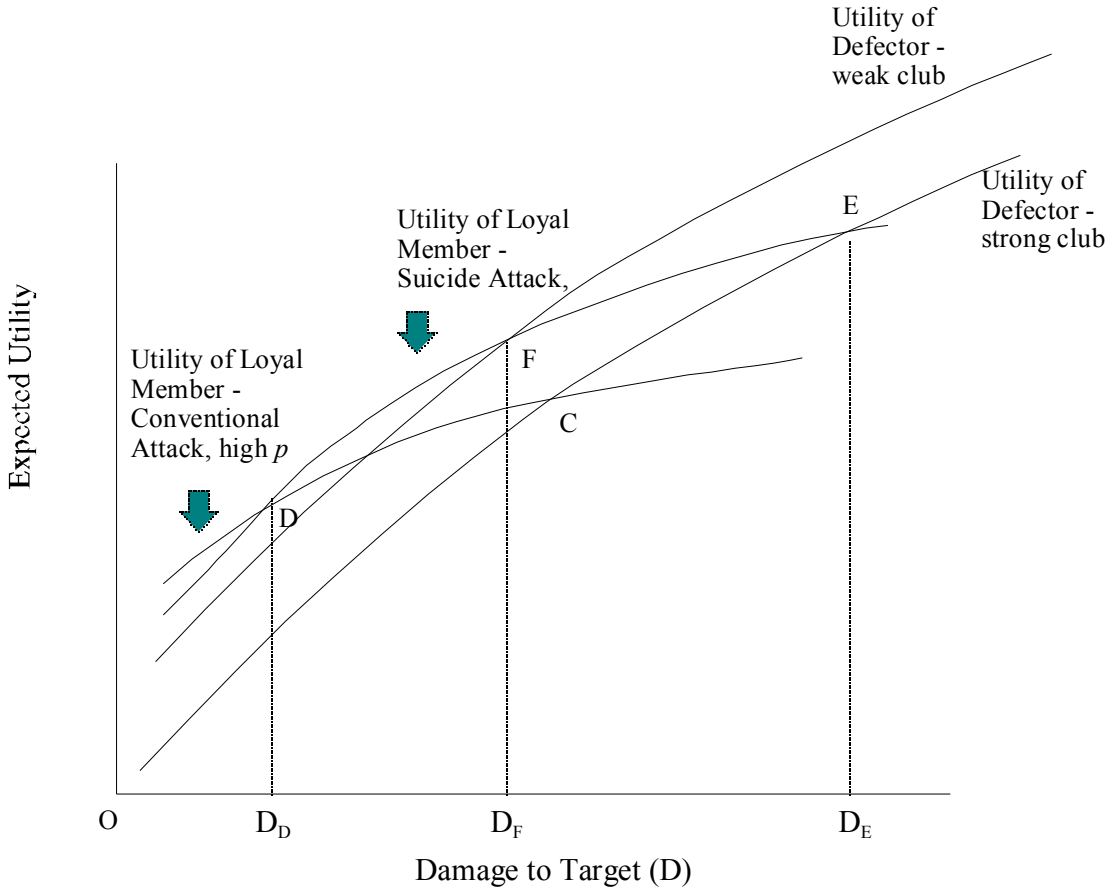

Figure 4: Strong Clubs Choose More, Deadlier Suicide Attacks

The subtler predictions of the model come from the interaction of club strength, choice of tactics and damage. Consider the contrast between strong and weak clubs, in the sense that a strong club is capable of selecting operatives less tempted by defection. Figure 4 illustrates that if the environment favors suicide attacks for a weak club, a strong

club will carry out even more suicide attacks and those will be deadlier. In that Figure, a weak club will use conventional attacks for relatively low damage targets, in the interval $(0,D_D)$ and switch to suicide attacks for higher damage targets, in the interval (D_D, D_F). The most damage it can do is D_F, since larger targets will induce defection. A strong club has lower utility from defection for a given level of damage, as represented by the rightmost curve. That advantage is entirely expressed as an expansion in its capability to carry out suicide attacks, with no effect on the decision to carry out conventional attacks. Both strong and weak clubs will carry out conventional attacks in the interval $(0,D_D)$. The strong club will use a wider range of targets for suicide attacks (D_D, D_E), while the weak club will attack targets only in smaller damage range (D_D, D_F).

Furthermore, the strength of the club is not in its theology but in the extensiveness of its social service provision network. The testable implications are then two: *First, the stronger the social service provision function of the club, the greater the proportion of its attacks will be suicide attacks. Second, the stronger the social service provision function of the club, the more damage it will do per suicide attack.*

Data from Israel and Palestine largely support these implications. Table 6 reports on organizations which have carried out both conventional and suicide attacks in Israel and Palestine. While they were selected according to the criterion of having carried out at least one suicide attack, Figure 4 indicates that this is the range of organizations for which the model can make predictions. We went to the description of these groups in the ICT dataset (whose coders did not have our theory in mind) to see if there was any mention of social welfare provision by each organization, as an indicator of being a "strong club." As is predicted in our model, the two welfare providing organizations conduct more suicide attacks and have a higher yield per suicide attack than the three non welfare providing organizations.

Table 7 reports on the second of those implications, that strong clubs will choose the suicide attack tactic more often. Recall that this follows from Figure 4: strong clubs attack targets in the interval D_F through D_E for which only the suicide tactic is effective, while weak clubs cannot attack those targets for fear of defection. Table 7 lists the four Palestinian terrorist organizations. Hamas and the Palestinian Islamic Jihad have the highest proportion of suicide attacks, with 43% each. The PFLP follows with 13% and Fatah is the last, with 12%. With the exception of the PIJ, the pattern is as predicted by the model. The Hamas, the strong club (in the sense of having a widespread social service network) chooses the suicide attack tactic at least as often as the PIJ, which has very little if any social service provision, and more than Fatah and PFLP. The fact that the PIJ chooses suicide attacks so often despite its lack of a social service provision network may indicate that theology and indoctrination have a role in motivating suicide attackers. But our model helps explain, despite theological fervor, PIJ's relative lack of effectiveness (see Table 6). We therefore see these results as broadly consistent with the prediction of the model, that strong clubs will exploit their organizational advantage in suicide attacks.

Section 4. Conclusion and Extensions

This paper combines data on suicide attacks and a theory of clubs to address the question of why suicide attacks are employed as a tactic in an insurgency. It was motivated by several unusual patterns in the data. Though insurgencies typically target poor countries, suicide attacks are far more likely to target rich democracies. Though insurgents often kill coreligionists, they seldom use suicide attacks to do so. Though many groups have grievances, suicide attacks are favored by the radical religious.

To make sense of these patterns, we modeled the choice of tactics by rebels. We first asked what a rational suicidal terrorist would have to believe and discuss the role of religion in those beliefs. Standard rational choice accounts find that with plausible utility functions, recruitment of martyrs does not require appeals to irrationality or utter fanaticism. The real task for the success of suicide attacks is not recruitment per se, but rather recruitment of a type of martyr who will not make defection likely. To address this strategic problem, we proposed a club good model that emphasizes the function of voluntary religious organizations as efficient providers of local public goods. The sacrifices which these groups demand are economically efficient and make them well suited for solving the extreme principal-agent problems in recruiting candidates for suicide attacks who will not defect. Thus religious radicals are effective dispatchers of suicide bombers. The model also analyzed the choice of suicide attacks as a tactic, predicting that suicide will be used when targets are well protected and when damage is great. Those predictions are consistent with the patterns that we earlier described. Our model had testable implications for tactic choice and for damage achieved by terrorists. We tested those predictions, and the data are consistent with the models.

There remains an unsettling anomaly that we have not as yet acknowledged. Our data on clubs, social welfare services, and choice of hard vs. soft targets are all from a single conflict, that of the Palestinians against the Israeli state. However, accounts of the Tamil Tigers are hardly consistent with the club model as we presented it. For one, although most of the Tamil Tigers are Hindus (some are Muslims and some Christians), the LTTE is completely secular, such that the resources used by radical religious groups to induce sacrifice are not used by the Tigers.[25] Second, the Tigers have no record of providing essential services to the poor in order to reduce members' reliance on the state. If fact, in Jaffna (the peninsula in northern Sri Lanka that has for a long time been under de facto Tamil control) the Tigers slowly and rather reluctantly provided governmental services to the population, once they controlled the area. Third, the Tigers have not sent their most valuable cadres to perform suicide missions, but most often young boys who had little training in discretion. In fact, the Tigers used intimidation for recruitment, threatening Tamils that they would punish relatives if they did not perform patriotic services.[26] Although we lack data on the terrorist organizations in Chechnya and

[25] . The secular nature of the Tigers can be overstated. As their war developed against the Sri Lankan state, several observers have noted the use of Hindu symbols for purposes of recruitment, and that they rely on the language of religious martyrdom to justify and reward the sacrifice (Cutter, and see an informed web-based discussion on the religious connection at hppt:/www.mail-archive.com/tips@fre.fsu.umd.edu).

[26] . We thank Mia Bloom for preliminary data on the age and education of Tamil martyrs.

Kurdistan, we suspect that their suicide attackers resemble more those of the Tamil Tigers than those of Hamas.

Given these descriptions, we recognize a need to expand the club model in the following way. Imagine a club which threatens the general population while protecting its members from that threat. It provides a public bad for nonmembers and a local public good for members (relative to nonmembers). Formally that club operates like that described in our model with one important difference: rather than reducing the risk of defection by augmenting the inside options of members with benign local public goods, it reduces the risk of defection by destroying outside options of members with a pervasive public bad – threat of attack from the club itself. That is one possible interpretation of the decade before rebellion during which the LTTE assassinated and intimidated rival nationalist groups until it achieved a monopoly on violent conflict. This line of logic is reminiscent of Charles Tilley's characterization of state building as a protection racket.[27]

An extreme example of this logic of controlling cadres by manipulating outside options is the gruesome practice in the LTTE of abducting youth, and training them for suicide attacks. The children cannot easily defect, in part because their parents are *de facto* hostages.[28] The altruism of these children allows them to be extorted into suicide attacks.

This extension does not challenge the model that radical religious groups are well-equipped to recruit cadres unlikely to defect for suicide attacks. It does suggest that these groups are not *uniquely* capable of efficiently organizing violent rebel activities. An alternative to the relatively benign practice of insulating the organization against defectors by augmenting inside options is the ruthless practice of destroying outside options.

However differently we might interpret the club model to account for the Tamil case, our discussion of soft vs. hard targets remains relevant, and suggests why religious difference still matters. In the early years of the Tamil insurgency, as Swamy reports, most of the activity was intra-Tamil warfare, as many groups vied to become the monopoly representative of the Tamil population of Sri Lanka. For all the intra-Tamil killing, there were no cases of suicide attacks. Our explanation for this is that the targets of competing organizations were too "soft", that is they could be attacked by infiltrators with a low probability of being identified as probable members of a competing group. However, in the insurgency against the Sinhalese, Tamils faced harder targets and a greater incentive to use suicide attacks as a standard tactic. However, since Sri Lanka has had a relatively weak security apparatus, their targets were not *that* hard, allowing the Tigers to send cadres of lesser skills than is required by Hamas.

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[27] "War Making and State Making as Organized Crime" in Peter R. Evans, Dietrich Rueschemeyer, and Theda Skocpol, eds., *Bringing the State Back In* (Cambridge: Cambridge University Press, 1985), 169-186

[28] . See Human Rights Watch, Report on Child Soldier Use in Sri Lanka, http://www.hrw.org/reports/2004/childsoldiers0104/16.htm (downloaded January 25, 2004) for allegations and support for these allegations.

A second problem for our model concerns the relationship of wealth to tactic choice. A possible interpretation of this model is that poverty should breed terrorism as it lowers the outside options of club members. That would appear to be inconsistent with the findings of Berrebi (2003) and Kreuger and Maleckova . (2003) who find that leaders and suicide attackers tend to have about the same income levels as their neighbors, and higher educational levels. It may be critical here to distinguish between incentives to join the club, incentives to defect and the selection that goes on inside. Self-selection would suggest that the leaders have a higher skill level. We know that those chosen to carry out suicide attacks are carefully screened to reduce their probability of defection or capture, either by ensuring that they were trusted members of the organization or by their having some motivation for revenge, such as losing a family member to the enemy. On the other hand, the accuracy of warnings of attack in Israel suggests that defectors exist. Beyond that we know very little about them, for obvious reasons. Thus, on the individual level, the link between poverty and terrorism in the club model would be very hard to test *directly*. In this paper we have provided an *indirect* test, showing that the stronger is benign local public good provision within the club, the more effective they are at attacks –using the admittedly repulsive measure of deaths per attack.

The analysis suggests the following cross-country pattern, which is consistent with the results reported here and those reported in Krueger and Laitin (this volume). In poor states targets tend to be relatively soft so that suicide attacks are not necessary. In wealthy states targets are hardened, inducing rebels to change tactics and adopt suicide attacks. Yet wealthy states or regions within states are seldom the base of organizations dispatching suicide attackers since outside options would induce defection with wealthy targets at stake. The economic conditions that best predict suicide attacks would seem to be the combination of wealthy states as targets and failed or failing states or regions in misery (e.g. Yemen, Afghanistan, Palestine, Lebanon) as sources of either for recruitment or training. This prediction should be understood notwithstanding the fact that terrorists have ideological motivations beyond income and that some terrorists have come from the wealthiest states. For instance, Timothy McVeigh came from the U.S. and devastated lives. But his potential to do damage would have been far greater if economic conditions and state failure incentivized an organization like the club described above to recruit him.

Clearly more theoretical work is in order to account formally for non-religious based clubs and the reliance on cadres with high outside options. Here we gave only intuitions for future modeling. But there is empirical work to be done as well. We still lack a standard dataset of suicide attacks in particular and all terrorist attacks in general. RAND analysts, for example, advertise a dataset of suicide attacks with far more observations than reported here, but those data are not publicly available (Hoffman 2003). The data on total suicide attacks are very sensitive to definition. In the dataset presented herein, we did not count self-immolation or waves of soldiers marching into sure-death tank formations (as in the Iran-Iraq war) as examples of suicide attacks, and they surely bear a family resemblance to the phenomenon that we have isolated. But even

with the data on the dependent variables as presented herein, there ought to be further tests of our model. For example, an observable implication of our model is that the greater the level of benign local public goods (mutual insurance, physical protection) provided to members, the lower the defection rate. That would be especially true when the state and market do not provide substitutes to these services, as in failed states. Another observable implication is that the higher the potential damage caused by the attacks, the greater the incentive to defect. These implications demand future econometric test.

We believe our analysis has clear implications for economic policy to contain suicide terrorism. But we need to avoid misunderstanding. First, although the data show that suicide attackers come from richer countries than the typical insurgents, we see alleviating poverty as a positive. It should be remembered that it is the wealth of the targets that alters the tactics of the less well-off perpetrators in this model. Second, although we provide a secular rational-choice model, this is not to say that theology doesn't matter. In fact, theology is a particularly effective tool to lower the cost of recruitment, and provides to potential recruits a sense of high returns for the hereafter. Therefore, attempts to propagandize the theological proscription of suicide in the world religions should not be ignored. However, a model emphasizing organizational aspects of terrorism provides added explanatory power, and can help explain the variations among groups in their use of and success at organizing suicide attacks. Our approach is consistent with the theme of FL and Collier and Hoeffler (2001) that de-emphasizes the theological and ideological aspects of civil wars and regional conflicts, while finding that state competence, economics and topography matter more. The question that follows is what the policy implications are for the findings in this paper?

Although not directly tested here, a clear implication of our model is that weakening the benign activities of clubs reduces their ability to carry out attacks (suicidal or otherwise). If this turns out to be correct, this sort of reduction could be done either directly –by targeting their social service provision networks, or indirectly – by strengthening competing networks through government and markets. Social service provision by counter-insurgents, if a viable alternative to that which is provided by terrorist organizations, could indirectly raise the value to their members of defection in the face of a suicide attack. Substitution by the state in the provision of club goods ought to be considered in the package of strategies to stem the tide of suicide attacks. To be sure, weaker organizations have successfully implemented suicide attacks; but they have done so less often and less efficiently. Our model and analysis therefore suggest a strategy to reduce the frequency of suicide attacks and the efficiency of the attackers. While we do not suggest social service provision as a panacea, that analysis suggests that it is a potentially useful (and nonviolent) tool in what must be a multifaceted treatment of a complex problem.

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Tables

Table 1

COUNTRIES WITH ORGANIZATIONS THAT ORGANIZED SUICIDE ATTACKS

COUNTRY	NUMBER OF SUICIDE ATTACKS
ISRAEL	100
SRI LANKA	75
LEBANON	30
TURKEY	13
SAUDI ARABIA	8
RUSSIA	4
INDIA	3
EGYPT	1
CHINA	1
ALGERIA	1

Table 2: Suicide Attacks, Civil Wars and GDP/capita across Countries 1945-1999

	Total		Between Country		Within Country	
Dependent Var: Suicide attacks		w/ trend		w/ moun-tains		w/ trend
GDP/capita	.0097	.0050	.003	.004	.045	-.010
	(.0028)	(.0022)	(.009)	(.009)	(.011)	(.016)
Mountains				.005 (.006)		
Year		.0016 (.0003)				.0024 (.0005)
Dependent Var: War Indicator		w/ trend		w/ moun-tains		w/ trend
GDP/capita	-.069 (.004)	-.084 (.004)	-.096 (.019)	-.089 (.019)	.042 (.007)	-.109 (.010)
Mountains				.026 (.013)		
Year		.0048 (.0003)				.0066 (.0003)
N	6373	6373	6373	6373	6373	6373
Countries	156	156	156	156	156	156

Source: FL replication data is described in Appendix. Suicide is the count of suicide attacks in a country-year. Results are qualitatively robust to extension through 2001 (using 1999 GDP/capita figures) and to the exclusion of Israel.

Table 3

RELIGIOUS DIFFERENCES BETWEEN INSURGENTS (SUICIDE BOMBERS) AND TARGETED VICTIMS

	INSURGENCY	SUICIDE ATTACK
PERCENTAGE OF ONSETS (ATTACKS) WITH RELIGIOUS DIFFERENCE	16.5%	89.9

Table 4

RELIGIOUS DIFFERENCE AND CIVIL WAR INSURGENCIES

(Of the 116 civil wars in the Fearon/Laitin dataset, this table lists those in which the armies of the state and those of the insurgents were largely of a different religious faith)

Country	Insurgency
Azerbaijan	Nagorno-Karabakh
Bangladesh	Chittagong Hills / Shanti Bahini
Bosnia	Srpska Republic and Croats
China*	Tibet
China	Xinjiang
Cyprus	Turks and Greeks
India	Sikhs
India	Kashmir
Nigeria	Biafra
Philippines	Huks
Philippines	Moros in Mindanao
Russia*	Chechnya
Sudan	Anya Nya
Sudan	SPLA

* = two separate rebellions involving the same insurgent group

Table 5

ATTACKS ON ISRAELI RESIDENTS BY LOCATION AND TACTIC

Sept 2000 through July 2003

Location	Attacks	Fatalities	(of which) Fatalities due to Suicide Attacks
West Bank and Gaza	17,405	341	8
Inside Green Line	730	511	401
Total	18,135	852	409

Sources: Attacks, fatalities and fatalities due to suicide attacks inside green line are from the Israel Defense Forces spokesperson's office, as reported by Nadav Shragai in Ha'Aretz, September 26, 2003. Fatalities in West Bank and Gaza due to suicide attacks are from the ICT data for that period described in the Appendix.

Table 6

SOCIAL ORGANIZATION OF TERRORIST GROUPS AND EFFICIENCY OF SUICIDE ATTACKS

Organization	Social Welfare Institutionalization*	Suicide Attacks Accomplished	Average deaths/attack
Hamas	Yes	50	7.8
Hizbullah	Yes	30	22
Palestinian Islamic Jihad	No	23	3.8
Fatah (Fatah, Fatah Tanzim, and Martyrs of al-Aqsa	No	20	2.8
PFLP	No	2	5.5

Source: See Appendix for data sources.

* In its review of terrorist organizations, the ICT mentions the provision by the organization of social welfare benefits to ordinary citizens, going beyond ideological, religious and military tasks.

Table 7

TERRORIST ORGANIZATIONS IN ISRAEL
SELECTION OF SUICIDE BOMBINGS AS AN INSURGENCY TACTIC

Group	All terrorist attacks	Suicide Attacks	Percentage
Hamas	115	50	43%
PIJ	54	23	43%
Fatah (Fatah, Fatah Tanzim, and Martyrs of al-Aqsa)	161	20	12%
PFLP	16	2	13%

For all terrorist attacks, data from ICT dataset (http://www.ict.org.il/), data as analyzed on their dataset on October 23, 2003. For suicide attacks, data are the combined ICT and Pape dataset. First step, we took the data from Table 6 for column two. Second step, we asked for all terrorist events in the ICT dataset for each of the four organizations listed on the table. These data are on column 1. We had to omit Hizbullah from these calculations because the ICT dataset reports fewer total incidents of Hizbullah terror than the combined ICT/Pape dataset on Hizbullah suicide attacks.

Table A1

SUICIDE ATTACKS: SOME DESCRIPTIVE STATISTICS

Number of Suicide attacks in Full Dataset	236
Number of Suicide attacks in ICT Dataset	107
Total Number of Terrorist Acts in ICT Dataset	1427
Percentage of Suicide attacks of All Terrorist Attacks in ICT Dataset	7.4
Total Deaths from all suicide attacks (without 9/11/01) in full dataset	5,922 (2,603)
Average Number of Deaths Per Attack (without 9/11/01) in full dataset	25.1 (11.1)

Table A2

SUICIDE ATTACKS BY YEAR AND TOTAL KILLED

Year	Total Number of Attacks	Total Number Killed
1983	6	420
1984	2	19
1985	18	209
1986	3	11
1987	1	18
1988	0	0
1989	0	0
1990	2	6
1991	5	73
1992	1	1
1993	3	25
1994	10	117.5
1995	19	225
1996	18	283
1997	8	50.5
1998	13	400.5
1999	16	64.5
2000	23	195
2001	48	3564
2002	40	239

Data Appendix

This paper merges two datasets on suicide terrorism. The first is from Pape (2003, 357-60). The second is from the International Policy Institute for Counter-Terrorism, at the Interdisciplinary Center Herzliya, available on the web at: [http://www.ict.org.il/]. This version was downloaded Sept. 12, 2003. The dataset goes from 1980 through 2002, with the most recent suicide attack on November 22, 2002. However, there are only nine events recorded from 1980-87, so in effect the dataset covers fifteen years, 1988-2002.

Some Descriptive Statistics on Suicide attacks

While suicide attacks (given the spectacular and deeply troubling moral narratives that accompany the reporting of them) dominate our headlines, they are a rarely employed tactic in insurgencies and cause few deaths. Tables A1 and A2 provide some descriptive statistics from our dataset. There have been 236 recorded suicide attacks in eleven countries, with 42 percent of the cases coming from Israel.[29] Using just the integrated ICT dataset, suicide attacks represent less than 10 percent of all terrorist acts in the dataset.[30] Using the combined dataset, suicide attacks have accounted for 5,922 deaths, nearly half of them from a single day (September 11, 2001). Although the use of suicide attacks has tended to increase year-by-year over the past two decades (Table A2), if we consider the fact that since 1945 insurgencies have caused over sixteen million deaths, the tactic of suicide bombing appears as only a small footnote to that enormous death toll.[31]

Coding Rules

1. There were 56 observations that were in both datasets.
2. There were 40 observations in the ICT dataset for the year 2002, which was past Pape's range, and we included these in the full dataset.
3. There were 132 observations in Pape that were not in ICT, and we added them.
4. There were 9 observations in ICT in the years of Pape's range, but not included, and we added them.
5. There were 2 events in Pape (Dec 15, 1981, Iraqi Embassy; Aug 15, 1993, Egypt) with

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[29] . Most datasets classify the perpetrators as coming from "the West Bank". For purposes of this paper, the Palestinians are under the de facto control of Israel, and are fighting an insurgency either to take control over all of Palestine (capture the center) or to build a Palestinian state on some portion of current-day Israel. Suicide bombing is a tactic in the pursuance of this goal.

[30] . Criteria for what constitutes a terrorist act, and therefore a collection of the universe of cases of terrorist acts, are much disputed. In the ICT dataset, for example, there is a racialist bias. African terrorism appears if blacks kill white civilians, but not if blacks kill black civilians. There is also a pro-state bias, as state induced terrorism (e.g. the Sinhalese burning of Tamil properties in 1983) is not included. Suicide attacks, however, are less controversial for purposes of objective coding, making them more susceptible to descriptive statistical analysis.

[31] . In rather bad social science form, all too many papers seek to account for this outlier, obscuring the general situation for suicide attacks of high publicity and low deaths.

insufficient information, and were not included in the merged dataset
6. There were 2 events in Pape (March 27, 2001, Hamas in Jerusalem) that was considered a single event in ICT, and we considered it a single event in the merged dataset
7. There was a single observation in Pape, on Al-Qa'ida bombing of the US Embassies in Kenya and Tanzania; we counted this as two events (as they occurred in different countries, and I have a unique value for country of attack), and divided the total deaths in half, for each country.
8. Whenever Pape and ICT differed on deaths, we averaged the two death-counts, so some death counts are not integers.
9. Whenever Pape and ICT differed on group name of perpetrators, we deferred to ICT (all cases were in Middle East, and ICT had stronger explanations for choosing group)
10. For Sri Lanka, we counted as a missing value on religious differentiation if the bombing was into a crowd that was random in regard to religion; a genuine religious difference between perpetrator and target if the target was material (a ship; a government building; an army base) but controlled by the state; n.b. that there is religious differentiation if the bombing was aimed at a Muslim politician even he were from the North.