

## Counterterrorism and Terrorism in the Post-9/11 Era

This project investigates the role of post-9/11 counterterrorism policies on terrorist targeting choice and terrorist networks' actions to support local terrorist groups. Suicide terrorism is also investigated. In addition, we investigate terrorist abilities to disrupt economies.

**Modeling Area:** Risk Analysis

**Principal Investigator:** Todd Sandler

**Institution:** University of Texas at Dallas

**Other Investigators:** Patrick Brandt, Kevin Siqueira, Khusrav Gaibulloev, and Daniel Arce, University of Texas at Dallas, and B. Peter Rosendorff (New York University)

### **Project 1. Patrick Brandt and Todd Sandler: Target Substitution: A Dynamic Analysis**

This research examines the effects of security measures before and after 9/11 on the type of targets selected by terrorists. Target types can fall into five categories: government officials, military, private parties, business, and terrorists. Previous work on counterterrorism-induced terrorist substitution has either focused on the mode of attack (e.g., shifting from skyjackings to other kinds of hostage taking owing to metal detectors) or geographical location of attack. The current study utilizes advanced time series methods (Poisson autoregressive models and Bayesian changepoint models with time-varying arrival rate) to investigate how terrorists respond to government policies by changing its target of choice. For example, at the start of the modern era of terrorism in the late 1960s, officials were the target of choice. As officials gained protection, terrorists shifted to business targets. Defensive measures by businesses resulted in more attacks on private parties. We intend to quantify this substitution, especially after 9/11, in terms of magnitude and the temporal profile (i.e., how quickly does targeting adjust to antiterrorism actions). Our results will show that private parties are most at risk since they are now the most vulnerable target, due in part to post-9/11 actions. The project will identify changepoints in the data due to various government policies. These changepoints will be identified by the data rather than predetermined. Most important, the analysis will identify and quantify how terrorists substitute among targets.

**Objectives:** This project will identify how efforts to protect one class of targets may put other classes of targets at greater or lesser risks. This is important to know if the true payback from homeland security is to be calculated. Our analysis also is intended to identify changepoints, previously unidentified, where government actions may have helped or hindered in defensive measures against the level and nature of terrorist attacks. By identifying current and past vulnerabilities, our study can inform policymakers on where to reallocate counterterrorism resources to provide the best protection.

### **Project 2. Kevin Siqueira and Todd Sandler: Terrorist Network and Supporters: A Game-Theoretic Analysis**

The strategic interplay between a terrorist network, its local groups, and adversarial government is poorly understood. Since 9/11, al-Qaida has changed its form: it is now less of a group that plans and executes attacks and more of an organization that inspires local terrorist groups to action through its propaganda. We construct a multi-player, multi-stage game, whose players include the umbrella terrorist organization, local terrorist groups, terrorist supporters, and targeted governments. Potential terrorists' allegiance is influenced by the umbrella

organization's activities and the counterterrorist actions of the targeted government. The umbrella terrorist group determines its propaganda campaign and (possibly) how much effort to put into planning and carrying out its own attacks. Separately, local groups determine their terrorist attacks and the governments determine their counterterrorism measures. The level of terrorist attacks might also be influenced by the participation threshold of would-be local terrorists. Actions by the umbrella group or the government that alter this threshold may exacerbate or alleviate the terrorism problem. As the model is developed, we hope to better understand the behavior of an organization like al-Qaida and the implications that this terrorist group has for the media, terrorist recruitment, and governments. Thus far, al-Qaida has proven to be adaptable and has manipulated the media effectively, but appropriate government responses can limit or reverse this effectiveness.

**Objective:** This research project indicates the crucial role played by an umbrella terrorist organization in the post-9/11 period, where homegrown terrorists represent a formidable threat. By displaying the strategic interplay among component players, we intend to generate some useful and surprising policy insights.

### **Project 3. Khusrav Gaibulloev and Todd Sandler, Economic Consequences of Terrorism and Conflicts on Economic Growth**

Modern-day terrorists are bent on causing sufficient harm to society that targeted governments concede to their demands. This harm may be in terms of economic losses – e.g., the al-Qaida training manual invokes followers to attack “vital economic centers” to hurt the enemy. The purpose of Project 3 is to quantify the impact of terrorism and conflicts (i.e., civil wars and external wars) on income per capita growth for select geographical regions (e.g., Asia and Africa). In the case of Asia, we intend to divide the sample into developed and developing countries to investigate whether rich diversified economies are better able to withstand terrorist attacks without displaying significant adverse economic consequences. In addition, we want to investigate the *relative* economic impact of terrorism when compared with internal and external conflicts. Some preliminary runs for a sample of 42 Asian countries show that terrorism has half of the economic impact of an internal conflict. Next, we establish the pathway of these economic consequences through the crowding-out of investment and the crowding-in of government spending. Finally, we uncover the influence of democratic institutions on a country's ability to sustain terrorist attacks. Since 9/11, Asia has attracted many terrorist attacks and has become the most conflict-ridden region.

**Objective:** If governments know the economic harm caused by terrorism, then they are better able to calculate the gains from reduced terrorism. Knowledge of these economic gains from reduced terrorism informs policymakers, in part, on how much money to allocate to homeland security and defensive counterterrorism measures. That is, large gains can justify higher homeland security spending. Since US people and property are typically targeted abroad by terrorists, the economic consequences on venue countries are of interest to US policymakers when deciding aid and support foreign countries' counterterrorism measures.

### **Project 4: Todd Sandler, Daniel G. Arce, and B. Peter Rosendorff, Strategic Dimensions of Suicide Terrorism**

**Sandler, et al., Counterterrorism and Terrorism in the Post-9/11 Era**

Since the 1983 suicide car bombing of the US Marine barracks and French Paratroopers headquarters in Beirut, suicide bombings have been increasingly deployed by terrorists to kill and terrorize a target population. Except for 9/11, suicide terrorist attacks have not been used in the United States. The July 7, 2005 suicide bombings on the London transport system indicates that it is only a matter of time before such suicide attacks are used in the United States and other Western countries. No group that employs suicide terror does so exclusively; thus, a need exists to explain suicide terror as a component of a terrorist organization's overall strategy that also includes conventional (non-suicide) attacks and the provision of public goods to sympathizers and operatives. Currently, theoretical analyses of suicide terror are either non-strategic because they focus on an individual operative's decision to participate in a suicide attack, or examine the preemption of suicide attacks via "hits" on suspected operatives or planners. Since suicide operatives are rarely the masterminds of suicide attacks, a need exists to model the interaction between operatives and the leaders of the organization in order to explain the leader's choice between suicide and conventional attacks. Furthermore, the leader's choice is not made in isolation, but depends upon the counterterrorism policies of potential targets. We formulate a game-theoretic model that captures the strategic interdependence between all three actors: terrorist leaders, (potential) suicide operatives, and target governments. Of particular importance is the degree to which operatives consider the leader's preferences (solidarity). Moreover, target nations face a tradeoff between aggressive counterterrorism policies that harden targets but promote solidarity within a terrorist organization, and concessions that reduce support for terrorist organizations, but leave targets less protected. With respect to suicide terrorism, we also want to explain whether suicide terrorism is more conducive than conventional terrorism in creating a backlash and increased terrorist support. If this is the case, then proactive responses by the government may augment the level of suicide terrorism, which is just the opposite of what the government intends. We will show that, as terrorist propaganda and support increase government actions to be more proactive, terrorists' reliance on suicide attacks will increase rather than decrease. Thus, governments must rethink what works best against suicide terrorism – standard reactions may be counterproductive.

**Objectives:** Project 4 is intended to be a general game-theoretic model of suicide terror that can inform policy on the basic tradeoffs between the hardening of targets and backlash to counterterrorism policy. We are also interested in how terrorist organizations promote solidarity to implement suicide attacks. We identify some well-meaning policies that may increase terrorist reliance on more deadly suicide attacks. We seek a host of policy recommendations that will not only curtail such attacks but will make them less effective.

**Interface to Other Center Projects:** Projects 1, 2, and 4 will interface with other CREATE projects that concern counterterrorism such as the work of Vicki Bier or researchers at USC. Project 2 and 4 interfaces with other CREATE projects that use game theory. Project 3 allows policymakers to judge the economic consequences of terrorism. This knowledge then indicates a measuring rod for what can be saved in terms of economic costs if terrorism is reduced.

**Interface to non-Center Projects: Interfaces to non-Center Projects:** The Project 1's findings will be useful to DHS in allocating resources towards protecting potential targets. It will also inform the State Department about the risks that are being faced by our private citizens abroad. The techniques used can be applied to a wide-range of security problems including the analyses of IED attacks, suicide bombings, and shifts in terrorist target selection more generally.

**Sandler, et al., Counterterrorism and Terrorism in the Post-9/11 Era**

Project 2 is more of a conceptual, theoretical project that should be of use to policymakers that are increasingly confronted by homegrown al-Qaida-inspired terrorists. Project 2 and 4 are useful to the military and policymakers in terms of addressing al-Qaida and the use of suicide bombings by terrorist groups worldwide. Project 3 on growth would help to inform donor nations on how much aid should be given to cushion the impact of transnational and domestic terrorism in target countries.

**Technical Approach:** Project 1 uses advance time-series methods and is primarily empirical. Project 2 and 4 applies game-theoretical methods, while Project 3 uses panel-estimation methods.

**Major Products and Customers:**

Projects 1-4 will produce at least four academic papers that will be published in upper-tier refereed economics and/or political science journals. The papers will be presented at national meetings in economics and political science. They will also be presented at universities. The research papers will be used by students and researchers in the field. The analysis will also inform policymakers.

**Major Milestones and Dates:**

The project will run from Septembert 1, 2008 to August 31, 2009.

1. Project 1 will be completed and written up by December 31, 2008.
2. Project 2 will be modeled by December 2008 and written up by February 1, 2009.
3. Project 3 will be completed and written up by November 30, 2008.
4. Project 4 will be modeled by June 30, 2009 and written up by. August 1, 2009.