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## New frontiers of terrorism research: An introduction

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### Abstract

This article opens the special issue by identifying the main contributions to date of the empirical and theoretical literature on terrorism. Important past theoretical articles investigated the application of game theory to study interactions among adversaries (e.g. terrorists and governments) and allies (e.g. commonly targeted governments). Past empirical articles examined the effectiveness of counter-terrorism policies, the root causes of terrorism, the dynamics of terrorist attacks, and other topics. This introduction also indicates new areas of research emphasis – e.g. the study of suicide terrorism and foreign aid as a counter-terrorism tool. Next, the introduction highlights some key definitions – e.g. domestic and transnational terrorism – that are applied throughout the special issue. Each article of the special issue is then introduced and briefly discussed. These articles display a rich diversity of topics and methods; nevertheless, they enlighten the reader on the consequences of terrorism. Topics in the special issue include the social impact of interrogation methods; the consequences of aid-assisted counter-terrorism; the roots of domestic terrorism; the adverse effect of terrorism on growth; the use of experiments to study counter-terrorism; the relationship among terrorism, trust, and income; and legislative responses to transnational terrorism. The two main event datasets – *International Terrorism: Attributes of Terrorism Events* (ITERATE) and *Global Terrorism Database* (GTD) – are also compared.

### Keywords

domestic terrorism, frontiers of terrorism research, impact of terrorism, policy insights, transnational terrorism

### Introduction

Almost a decade has passed since the horrible events on 11 September 2001 made the world acutely aware of the significant threat posed by terrorism. Even though transnational terrorism had plagued the world after 1967, no event before these four hijackings caused so many casualties or had such a profound influence on the global awareness of terrorism risks. The events on that fateful day induced an inflow of government spending into counter-terrorism activities in many at-risk countries (Enders & Sandler, 2006).

Since 11 September 2001, scholars in economics, political science, and other disciplines have devoted much effort to the study of terrorism and its impact on the economy and society. Some studies have investigated the reverse impact – i.e. the influence of the economy and social grievances on terrorism (Abadie, 2006; Blomberg, Hess & Weerapana, 2004). In recent years, there has been much scholarship that applies empirical

and theoretical methods to the study of terrorism. The former has been facilitated by increased availability of data on terrorist events – e.g. *International Terrorism: Attributes of Terrorism Events* (ITERATE) and *Global Terrorism Database* (GTD). The development of new econometric techniques involving time series and panel estimations also bolstered novel empirical studies on terrorism. On the theory side, many recent theoretical articles have used game theory (Arce & Sandler, 2005; Bapat, 2006; Sandler & Siqueira, 2009). As a theoretical tool, game theory is particularly appropriate because it accounts for interactive rational choice, where adversaries (e.g. terrorists and governments) or allies (e.g. commonly targeted governments or different factions in a terrorist group) must take actions, while accounting for the

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anticipated responses of others. Moreover, these actors realize that their counterparts are also trying to anticipate their responses. In the study of terrorism, game theory has provided important insights in understanding bargaining in hostage negotiations (Lapan & Sandler, 1988), the recruitment of terrorists (Bueno de Mesquita, 2005), the practice of counter-terrorism (Enders & Sandler, 1993), and the structure of terrorist networks (Enders & Jindapon, 2010).

Previous empirical studies have analyzed the effectiveness of counter-terrorism policies (Enders & Sandler, 1993; Landes, 1978; Zussman & Zussman, 2006), the macroeconomic consequences of terrorism (Blomberg, Hess & Orphanides, 2004; Keefer & Loayza, 2008), the sectoral effects of terrorism (Drakos & Kutun, 2003; Enders, Sandler & Parise, 1992), the root causes of terrorism (Krueger & Maleckova, 2003), the role of failed states (Piazza, 2008), and the dynamics of terrorist attacks (Brandt & Sandler, 2010). These and other studies generated policy insights – e.g. metal detectors in airports induced terrorists to substitute into other kinds of hostage-taking attacks. Recently, scholars have turned their attention to the study of suicide terrorism (Pape, 2005; Wintrobe, 2006), the strategic analysis of terrorist organizations (Feinstein & Kaplan, 2010), the optimal allocation of defensive resources (Powell, 2007), and the use of foreign aid for counter-terrorism purposes (Azam & Thelen, 2010; Bandyopadhyay, Sandler & Younas, 2011). Many other terrorism topics are being pursued.

The purpose of this special issue of the *Journal of Peace Research* is to present new scholarship on the impact of terrorism on myriad concerns including foreign assistance, trust, interrogation techniques, economic growth, and security choices. Additionally, one article considers the root causes of domestic terrorism in terms of poverty and economic discrimination. The articles explore the new frontiers of a fast expanding boundary of knowledge concerning terrorism and counter-terrorism. The new frontiers involve new methodologies (e.g. experiments and spatial dependence) and new topics (e.g. trust, interrogation techniques, and legislative responses) in the study of terrorism.

### Some preliminaries

Terrorism is the premeditated use or threat to use violence by individuals or subnational groups to obtain a political or social objective through the intimidation of a large audience beyond that of the immediate victims. The key ingredients in this definition concern the political

or social objective, the non-state perpetrator, and the need for a large audience. Violence for non-political goals – e.g. a kidnapping for ransom, not intended to promote a political agenda – is a crime, but is not terrorism. If the perpetrator is a state, then state terrorism results. Although state terrorism is an important concern, it is not the terrorism that is addressed in the special issue. Finally, terrorists want a large audience to feel at risk so that public pressures are applied to officeholders or rulers to concede terrorists' demands for change. To create this general atmosphere of fear, terrorists engage in various types of operations – kidnappings, bombings, assassinations, hijackings, and armed attacks – in a seemingly random fashion so that everyone feels in jeopardy. But in fact, these attacks are not random; instead, terrorists trade off risk and return when choosing their targets. Soft, high-valued targets are particularly attractive. Terrorism is a tactic of the weak to deploy against the strong. With a carefully planned and executed campaign, small groups of extremists may effectively use violence to gain a presence. Even though governments seldom cave in to terrorist demands,<sup>1</sup> these campaigns can still have many deleterious effects – e.g. a general sense of fear or restrictions on civil liberties – on targeted societies. Governments may have to spend heavily on counter-terrorism measures that raise taxes and divert public moneys from more productive activities.

An important distinction used at various places in the special issue is that of domestic versus transnational terrorism. Domestic terrorism involves perpetrators, targets, victims, venues, and audience in the same country. The kidnapping of a local politician by a domestic terrorist group to promote political change at home is an example of domestic terrorism. Domestic terrorist events far outnumber transnational terrorist incidents (Enders, Sandler & Gaibullov, 2011). Countries are motivated to address domestic terrorism because the associated benefits or costs of doing so are solely gained or borne at home. There are no opportunities to rely on counter-terrorism actions taken by other countries, because such measures abroad do not curb domestic terrorism in other countries.

Through its perpetrators, victims, institutions, governments, or implications, transnational terrorism concerns more than one country. A letter bomb sent

<sup>1</sup> Pape (2005) noted that about 50% of suicide terrorist campaigns are successful; however, Moghadam (2006) questioned this percentage and showed that only 25% of the suicide campaigns, noted by Pape (2005), had been successful. Most terrorist campaigns are not suicide campaigns and are not successful in obtaining concessions.

for political purposes by a terrorist group in country *A* to intended targets in country *B* constitutes a transnational terrorist incident. The downing of Pan Am flight 103 over Lockerbie, Scotland, on 21 December 1988, was a transnational terrorist incident because the victims were from a number of countries, the perpetrators were foreigners (neither American nor British), and the bomb was transferred in London from a flight originating in Malta. The takeover of the US embassy in Tehran on 4 November 1979 by radical Islamic students was another instance of transnational terrorism. Transnational terrorism is more difficult than domestic terrorism to address owing to the need for international cooperation, which faces many roadblocks – e.g. the unwillingness of nations to sacrifice their autonomy and control over national security matters.

Another distinction germane to some of the articles in this special issue (e.g. Arce, Croson & Eckel, 2011; Bapat, 2011; Enders, Sandler & Gaibullov, 2011) concerns the two types of counter-terrorism policies. Defensive policy involves hardening targets through protective measures that make it more costly for terrorists to attack successfully. Defensive measures also limit the damage in case of an attack. Often, defensive measures are reactive – e.g. checking shoes at airport security after the shoe bomber, or deploying full-body imagers after the underwear bomber. In the case of transnational terrorism, defensive measures can give rise to targeted countries engaging in a ‘protection race’ in the hopes of transferring attacks abroad. This inclination is attenuated if a country has assets and citizens abroad, because the transfer can jeopardize the country’s own interests abroad. The same inducement to transfer attacks to other venues is not a concern for domestic terrorism insofar as a central government oversees such defensive decisions, unlike the case of transnational terrorism, and does not gain from such transfers. The other category of counter-terrorism consists of proactive or offensive measures, which seek to limit or destroy terrorist resources. Proactive responses involve the infiltration of terrorist groups, the collecting of intelligence, the curbing of terrorist finances, and the destroying of terrorist training camps. For transnational terrorism, there is a marked tendency to do too few proactive operations, because one country’s actions against a common terrorist threat provide a pure public good to all targeted countries.

### Articles in the special issue

The Enders & Jindapon (2011) article applies game theory to contrast two alternative strategies of detainees, which may include terrorists or soldiers in the ‘war on

terror’. One strategy – Big 4 – requires a prisoner to provide only his or her name, rank, serial number, and birth date, while the other strategy – Little Fish – allows a prisoner to give useful verifiable information. In the latter case, this information causes limited harm to the detainee’s group or government; nevertheless, the information demonstrates that the prisoner is cooperating. If this strategy works and more extreme interrogation methods are not subsequently applied, then the detainee and the interests that he or she represents may be protected, because more damaging information may not be extracted under duress. In contrast, the Big 4 strategy will result in harsher interrogation measures being applied by the captors. Enders & Jindapon construct two game structures to show that the Little Fish game may Pareto dominate the Big 4 game, so that all interests – those of the detainee, the interrogator, and society – are made better off. Society may gain because it does not necessarily impose extreme interrogation measures that tarnish its reputation and create backlash attacks.

This article contains a number of findings. First, it shows that game theory may disclose novel insights. Second, the article offers perspectives on an important debate that was raised by the Bush administration’s claims that torture may protect against future terrorist acts, so that the ends justify the means. The game-theoretic analysis here casts serious doubts on this assertion insofar as terrorists playing Little Fish are not really giving up very valuable information. Moreover, harsh interrogation methods may motivate new terrorist acts that greatly harm the government and society at large. Third, the article puts forward an analytic structure that captures the conflict between human intelligence collectors and society. The Little Fish game results in constrained interrogation methods compared with Big 4. This finding indicates that standard operating procedures for captive soldiers are not optimal. Fourth, their model may be applicable to other strategic interactions with asymmetric information. Finally, the method may be applied in the future to uncover strategies for detainees that Pareto dominate Little Fish and Big 4.

The Bapat (2011) article represents another application of game theory in the study of counter-terrorism. This article asks the question of why a rich targeted country supplies proactive military aid to countries with a resident terrorist group when past studies have shown this aid to be ineffective or even counter-productive. The author puts forward a game with three active players – the US government, the host state (*H*), and the terrorist group (*T*) – that operates in the host country. The US government moves first by offering its aid to

country  $H$ , which then negotiates with the terrorists, takes defensive measures, or engages in offensive measures. For the first two choices, the terrorists must accept or reject  $H$ 's offer or attack the government. Other choices may follow at later points in the game.

Bapat shows that US military aid can create a moral hazard problem for country  $H$ , since its aid ends once the terrorists disband or are defeated. Consequently,  $H$  has little incentive to eliminate the resident terrorists if it wants to keep its aid; thus,  $H$  takes defensive measures against the resident terrorists. This response is hypothesized to lengthen the duration of terrorist groups in countries receiving US military assistance to counter a resident terrorist threat. Country  $H$  must, however, worry about the terrorists gaining strength and support over time with their longevity. Although the terrorist group may exist for a longer time because of aid, the USA may gain from the reduced incentive of country  $H$  to negotiate with the anti-American terrorist group. Thus, the USA may profit even though its military assistance keeps the terrorist group around for longer. In an empirical test, Bapat applies a hazard model to show that the duration of a resident terrorist group indeed increases significantly with US military assistance to the host country, as hypothesized.

With the wide release of GTD, researchers now have access to a long dataset (currently 1970–2007) that records numerous variables for terrorist incidents. Variables include, among others, the incident date, country of location, mode of attack, terrorist group responsible, and the number of casualties. Researchers are flocking to the data without questioning its strengths, shortfalls, or properties. Although GTD includes domestic and transnational terrorist incidents, GTD does not explicitly distinguish between the two types of terrorist incidents. This distinction is essential for some analyses – for example, the Gaibullov & Sandler (2011) article finds that only transnational terrorist incidents harmed income per capita growth in Africa. Moreover, the root causes for domestic terrorism may be quite different from those for transnational terrorism. In addition, foreign assistance may be more easily justified by targeted countries to support a recipient country's efforts to curb transnational, rather than domestic, terrorism. A comparison and contrast between domestic and transnational terrorism is missing from the literature; Enders, Sandler & Gaibullov (2011) provide this analysis.

Their article serves many purposes. First, it devises a method for partitioning GTD into three types of events: domestic, transnational, and unknown. Second, Enders, Sandler & Gaibullov put forward a calibration method

based on ITERATE transnational terrorist incidents to overcome reporting problems in GTD prior to 1998. This calibration process identifies potential biases in GTD stemming from undercounting and overcounting terrorist incidents. Third, the article identifies research questions where investigators should use either domestic or transnational terrorism data. In some instances, both types of terrorism data are required. Fourth, Enders, Sandler & Gaibullov investigate the co-movements (if any) between domestic and transnational terrorist events, the correlations between specific kinds of terrorist incidents, and the composition of attack modes. Fifth, these authors apply vector autoregression (VAR) techniques to investigate shock-induced impulse response, variance decomposition, and Granger-causality tests. The authors find that shocks to domestic terrorism spill over to affect transnational terrorism; however, there is no evidence of reverse causality.

The Piazza (2011) article returns to the elusive relationship between poverty and terrorism that was drawn by the Bush administration, the media, and commentators following 11 September 2001. As Piazza notes, the literature found mixed results: many studies demonstrated no relationship between aggregate income indicators and transnational terrorist events, while other studies tied poverty in a terrorist's home country to terrorism in richer venue countries. Micro-level studies showed that terrorists are neither necessarily poor nor uneducated. Piazza takes a different approach by using measures to ascertain whether domestic terrorists come from social groups that are marginalized by government policies or adverse social conditions. That is, domestic terrorists may be aggrieved individuals from groups that experience economic discrimination with no remedial action by the government. In testing its hypotheses, this article is relying on less aggregate data to identify some root causes of terrorism.

Piazza uses the division of GTD incidents into domestic and transnational terrorist events, engineered by Enders, Sandler & Gaibullov (2011). However, Piazza uses only domestic terrorist event counts as his dependent variable in his reported runs. Three discrimination variables – the presence or absence of minority economic discrimination and government remediation of such discrimination – are drawn from Minorities at Risk (MAR) data, compiled by the Center for International Development and Conflict Management at the University of Maryland. Piazza's main finding is that countries with minority groups that are subjected to economic discrimination will experience more domestic terrorist incidents. Moreover, remedial actions to reduce



this discrimination limit domestic terrorism. These two important findings are robust to a set of standard controls. The zero-inflated results indicate that countries with no domestic terrorism generally do not have minority groups that suffer economic discrimination. The study also shows that aggregate poverty measures of income do not increase domestic terrorism.

With panel estimates, the Gaibullov & Sandler (2011) article investigates the impact of terrorism on income per capita growth for 51 African countries for 1970–2007, while accounting for cross-sectional (spatial) dependence and other forms of conflict (i.e. internal and external wars). The authors use Enders, Sandler & Gaibullov's (2011) division of GTD into domestic and transnational terrorist incidents to distinguish the differential impacts of the two types of terrorist events on growth. For their baseline fixed-effects models, the authors find that transnational terrorism had a significant, but modest, marginal influence on income per capita growth. An average sample country sustained an annual reduction of just 0.1% to its income per capita growth. The analysis also finds that domestic terrorism did not have a significant adverse effect on income per capita growth. Alternative terrorist variables (e.g. total number of incidents and lagged terrorism) are used with little change in the findings that transnational terrorism had a significant negative growth effect, while domestic terrorism did not have a significant growth impact. This finding holds despite the fact that domestic terrorist events far outnumbered transnational terrorist events.

The analysis shows that internal and external conflicts resulted in 1 to 2% loss in annual growth, consistent with the civil war literature. Additional estimates account for the GDP share of government spending, trade openness, democracy, population, and population growth. The fairly modest impact of transnational terrorism on growth informs policy on how much counter-terrorism expenditure is justified for addressing transnational terrorism. Of course, there are other grounds for curbing transnational terrorism based on lost lives and political instability. The study shows that wars are a much larger growth concern.

The Arce, Croson & Eckel (2011) article on 'Terrorism experiments' takes stock of past applications of experimental economics to the study of counter-terrorism. In addition, their analysis indicates fruitful ways of extending the use of experimental economics in evaluating counter-terrorism. Most terrorism datasets – ITERATE and GTD – are event data that are better at recording the terrorists' responses (e.g. size of attack squad, sequential release of hostages, and number of

hostages seized) than the government's responses. Without better information about how governments behave in terrorism situations, researchers have a difficult time in testing and assessing some theoretical propositions associated with the economic study of counter-terrorism – e.g. commonly targeted governments will spend too little on proactive measures. Under controlled circumstances, the experimental approach can provide data to evaluate some counter-terrorism propositions.

Arce, Croson & Eckel focus on four research questions. The first area involves interdependent security games where the security choice and safety of one player hinge on the security choice of other players. An apt example is airline security where each flight's safety depends on how well its air carrier screened its own luggage and how well transferred luggage had been screened by other airlines. Generally, transferred luggage is not rescreened. A second area concerns 'Colonel Blotto' games in which two adversaries – say, a terrorist and a government – must allocate resources at vulnerable points (targets). This application is particularly germane to the study of defensive countermeasures where the authorities protect alternative terrorist targets at home. These authorities must determine which targets are defended and by how much. Additionally, they need to decide which targets are left undefended. A third area is the global security game, first introduced by Sandler & Lapan (1988), where a transnational terrorist group targets two or more countries. These countries must decide between defensive and proactive countermeasures, while accounting for the anticipated response of other targeted countries. Elements of public good and commons games figure into the analysis. A fourth area involves punishment and vendettas leveled against free riders. In the terrorism context, the free riders may be countries that rely on the proactive measures of other countries.

The Blomberg, Hess & Tan (2011) article is the first study to relate terrorism and trust. The latter is measured by survey data, drawn from the World Values Survey (WVS) at four snapshots in time – 1990, 1995, 2000, and 2005. In particular, trust is measured by the percentage of respondents in each country who answered that 'most people can be trusted'. The mean share measure for trust in the surveyed countries is 0.27; 27% of respondents answered yes to the trust question. The authors conduct two estimation exercises: (i) one regresses the probability of trust on a set of independent variables, and (ii) another regresses the level of average income of individuals on a set of independent variables, including trust. This latter equation allows the authors to distinguish the direct effect of terrorism on income levels from the

indirect effect via terrorism-induced trust reduction. In the trust equation, independent variables include a terrorism measure, a war measure, individual-level controls (e.g. education, age, marital status, and employment status), and social capital measures. In the income equation, independent variables include a terrorism measure, a war measure, trust, and individual-level controls. Throughout their study, the authors' terrorism measures involve only transnational terrorism, as drawn from ITERATE.

The trust regressions show that transnational terrorism had a significant negative influence on trust, which is far smaller than that of war in most of the estimates. Consistent with other trust studies, the authors find that higher education, age, and marriage augmented trust, while unemployment status decreased trust. Transnational terrorism had a large negative influence on income levels, with subsequent regressions showing that poor people were harmed much more than rich people. The direct negative impact of terrorism on income levels is much greater than the indirect negative impact through trust. In fact, the entire impact is only about 10% greater than the direct impact, so that income reduction via terrorism-induced losses in trust is modest. War and unemployment had a large adverse effect on income levels. These authors present a host of alternative estimation specifications to establish the robustness of their results.

The special issue concludes with a Special Data Feature contribution by Epifanio (2011). After the four skyjackings on 11 September 2001, many liberal Western-style democracies instituted legislative responses as a protective measure against future transnational terrorist incidents. These measures often infringed on civil liberties that affected citizens, suspects, and immigrants. Thus, in conjunction with the theme of this special issue, Epifanio puts forward a new dataset – *Legislative Response to International Terrorism* (LeRit) – to take stock of the legislative impact of terrorism. She distinguishes 30 anti-terrorism regulations and their changes in 20 liberal democracies for 2000–08. Her sample countries include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States. Her data come from primary – legislative – and secondary sources. These regulations concern myriad activities including money transfers, habeas corpus, privacy protection, surveillance, and visas. Government legislative responses are classified into privacy, procedural, and immigration laws.

Epifanio provides a baseline, ordered-logit analysis in which she identifies four considerations – a country's economic and political status (e.g. its per capita income

and military spending), its involvement in Afghanistan and Iraq, its share of Muslims in its population, and its political preference (e.g. left- or right-dominated government). Her tests show that governments enact more anti-terrorism legislation if they perceive themselves to be a more likely target of future terrorist attacks owing to their participation in the war on terror. Moreover, anti-terrorism restrictions increase with the country's share of Muslims in the population. High per capita income decreases such restrictions. The author performs some robustness runs with ITERATE terrorist events. Enders, Sandler & Gaibulloev's (2011) division of GTD into domestic and transnational terrorist attacks would allow researchers in the future to ascertain whether anti-terrorism legislation responds more to one type of terrorism.

### Concluding remarks

The articles in this special issue display much diversity in terms of topics and techniques that indicate the new frontiers of terrorism research. Two articles – Bapat (2011) and Enders & Jindapon (2011) – are primarily theoretical, while the other six articles are primarily empirical. The articles share commonality on three themes. First and foremost, all of the articles investigate the impact and consequences of terrorism. Second, many of the articles identify important methods, analyses, and data that can be applied to the study of terrorism and counter-terrorism. In particular, these methods involve experiments, advanced time-series tools, game theory, and panel estimates. Third, the articles generally address important policy questions: for example, foreign assistance as a counter-terrorism tool; interrogation methods in the war on terror; macroeconomic consequences of terrorism; the root causes of terrorism; and the interrelationship of domestic and transnational terrorism. These are pertinent policy questions as the war on terrorism enters its second decade.

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