

Domestic Versus Transnational Terrorism: Data, Decomposition, and Dynamics

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Abstract

This paper devises a method to separate the Global Terrorism Database (GTD) into transnational and domestic terrorist incidents. This decomposition is essential for the understanding of some terrorism phenomena when the two types of terrorism are hypothesized to have different impacts. For example, transnational terrorism may have a greater adverse effect than domestic terrorism on economic growth. Moreover, the causes of the two types of terrorism may differ. Once the data are separated, we apply a calibration method to address some issues with GTD data – namely, the missing data for 1993 and different coding procedures used before 1998. In particular, we calibrate the GTD transnational terrorist incidents to ITERATE transnational terrorist incidents to address GTD’s undercounting of incidents in much of the 1970s and its overcounting of incidents in much of the 1990s. Given our assumption that analogous errors characterize domestic terrorist events in GTD, we apply the same calibrations to adjust GTD domestic incidents. The second part of the article investigates the dynamic aspects of GTD domestic and transnational terrorist incidents, based on the calibrated data. Contemporaneous and lagged cross-correlations for the two types of terrorist incidents are computed for component time series involving casualties, deaths, assassinations, bombings, and armed attacks. We find a large cross-correlation between domestic and transnational terrorist incidents that persists over a number of periods. A key finding is that shocks to domestic terrorism result in persistent effects on transnational terrorism; however, the reverse is not true. This finding suggests that domestic terrorism can spill over to transnational terrorism, so that prime-target countries cannot ignore domestic terrorism abroad and may need to assist in curbing this homegrown terrorism.

Keywords: terrorism data sets, domestic and transnational terrorism, calibration, GTD, ITERATE, impulse response, vector autoregression

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Introduction

During the morning rush hour on 29 March 2010, two suicide bombers blew themselves up in the Moscow subway, killing 40 and injuring over 60 people. Because the female perpetrators were Chechen rebels from a part of the Russian Federation, the incident is a domestic terrorist event. Other noteworthy domestic terrorist incidents include the 20 March 1995 sarin attack on the Tokyo subway by Aum Shinrikyo; the 19 April 1995 Oklahoma City bombing of the Alfred P. Murrah Federal Building by Timothy McVeigh; and numerous suicide attacks in Sri Lanka by the Tamil Tigers. Although much of the empirical literature on terrorism has focused on transnational terrorism, domestic terrorism also poses a significant threat. In fact, domestic terrorist events outnumber transnational terrorist incidents many times over (Jongman, 1992). For proper analysis, some empirical questions require observations on both domestic and transnational terrorist events, while other questions require observations only on domestic or transnational terrorist incidents. For example, the study of the impact of terrorism on economic growth necessitates a distinction between domestic and transnational terrorist events, because the latter can have a larger influence by scaring away growth-promoting foreign direct investment and requiring expensive border defenses. In a different instance, economic discrimination directed at domestic minority groups is more apt to be a root cause of domestic, but not transnational, terrorism.

This past fixation on transnational terrorism is primarily due to the availability of terrorist event data. Since the late 1970s, the *International Terrorism: Attributes of Terrorist Events* (ITERATE) data set codes many variables – e.g., date, country location, target entity, casualties, and perpetrators – for transnational terrorist incidents. Currently, ITERATE covers 1968–2009 and is frequently updated (Mickolus et al., 2010). Until recently, the coverage of domestic

terrorist incidents in other event data sets has been very limited. For example, the *National Memorial Institute for the Prevention of Terrorism* (MIPT) or RAND data set began recording domestic terrorist events in 1998. MIPT codes only transnational terrorist attacks for 1968–1997. Engene's (2007) data set – *Terrorism in Western Europe: Event Data* (TWEED) – records 'internal attacks' for just 18 European countries for 1950–2004. A terrorist act is internal when the terrorists operate within their own country. TWEED's internal attacks may, at times, be transnational – e.g., when a French terrorist assassinates a Spanish official in France.¹ The first worldwide data set that includes domestic and transnational terrorist incidents for an extended time period is the *Global Terrorism Database* (GTD), maintained by the National Consortium for the Study of Terrorism and Responses to Terrorism (START). Currently, START's (2009a) GTD data cover 1970–2007; however, domestic terrorist incidents are not distinguished per se from transnational ones.

The interest in terrorism research has grown greatly since the four hijackings on 11 September 2001. Much of this research has been empirical, relying on ITERATE data. On 14 November 2010, a Google Scholar search of 'ITERATE and terrorism' turned up over 3,500 references. With the wide release of GTD, more researchers are using its data. In fact, there are recent papers using these data sets in the *Journal of Peace Research*, including articles in this special issue. Researchers use these data sets without questioning their underlying definitions, coding consistency, or contrasts.

The primary purpose of this article is to compare and contrast ITERATE and GTD data. Our comparisons include the sample properties of the two data sets, the co-movement (if any) between domestic and transnational terrorist events, the cross-correlations between specific kinds of terrorist incidents, and the composition of attack modes – i.e., hostage-taking events, bombings, and armed attacks. Such comparisons between these two data sets are novel and for

some event types – hostage incidents – are very surprising. Second, we develop a technique for distinguishing domestic from transnational terrorist events in GTD, based on the domestic-transnational distinction used by ITERATE and MIPT. No other article provides such a complete partitioning of domestic and transnational incidents.² This decomposition will assist researchers, who need just domestic or transnational terrorist incidents for their analysis. For example, Piazza (2011) required just domestic terrorist incidents to ascertain the impact of economic discrimination at home on domestic terrorism. Our decomposition also aids researchers who must contrast the differential impact of the two types of terrorism on, say, economic growth (e.g., Gaibullov & Sandler, 2008, 2011). Third, this article indicates how researchers can best use GTD data, given some of the data's idiosyncrasies and flaws – e.g., missing data in 1993 and inconsistent coding procedures before 1998. To achieve this purpose, we indicate and display a calibration procedure. Fourth, this article presents a novel exploration of the dynamic properties of domestic and transnational terrorist events with the help of time-series methods. To date, the dynamic interaction between domestic and transnational terrorism is completely unknown. If, for example, domestic terrorists eventually turn to transnational terrorism to gain greater exposure, then domestic terrorism may be a driver of transnational terrorism. The two kinds of terrorism may also be interrelated if innovations adopted by the terrorists or the authorities for one kind of terrorism influence these entities for the other type of terrorism. To investigate dynamic interrelationships, we apply vector autoregression (VAR) techniques to study shock-induced impulse responses, variance decomposition, and Granger-causality tests. Finally, the article draws some policy conclusions based on the differences between domestic and transnational terrorist incidents.

Preliminaries

Terrorism is the premeditated use or threat to use violence by individuals or subnational groups against noncombatants in order to obtain a political or social objective through the intimidation of a large audience beyond that of the immediate victims. There are a number of things to stress about this definition. First, terrorism is perpetrated by individuals or groups; state terrorism is not included. However, state-sponsored terrorism is included. Second, terrorism requires a political or social goal; attacks just to extort money are criminal acts. Third, terrorism involves attacks against civilians, officials, or noncombatants. Our definition comes close to that of the US Department of State (2003: xii): ‘terrorism means premeditated, politically motivated violence against noncombatant targets by subnational groups or clandestine agents, usually intended to influence an audience.’

A key distinction for this paper is between domestic and transnational terrorism. Because our goal is to compare GTD and ITERATE, we use the domestic-transnational distinction embedded in ITERATE.³ Domestic terrorism is homegrown in which the venue, target, and perpetrators are all from the same country. Thus, domestic terrorism has direct consequences for only the venue country, its institutions, citizens, property, and policies. If a domestic commercial flight with only nationals aboard is hijacked to another city in the same country for political purposes, then the hijacking is a domestic terrorist act. Most terrorist acts, staged in a struggle for independence, are domestic terrorism. The large majority of suicide bombings during the Second Intifada in Israel were domestic terrorist incidents. However, the Moscow Theater hostage seizure on 23 October 2002 by Chechen rebels was a transnational terrorist incident, because hostages included about 75 foreigners with citizens from Australia, Austria, France, Germany, and elsewhere (Mickolus & Simmons, 2006, Vol. 1: 127–130). On occasion, an intended domestic terrorist attack may become transnational owing to random factors – e.g., a foreigner near a blast that injures her – but since terrorists carefully plan their attacks, there are

no grounds for anticipating this occurrence to be frequent or nonrandom.

Through its victims, targets, supporters, or perpetrators, transnational terrorism concerns more than a single country. If the nationality of the perpetrators differs from that of one or more of the victims, then the terrorist attack is transnational. In addition, a terrorist attack is transnational when the nationality of a victim differs from the venue country. If terrorists transit an international border to perpetrate their attack, then the incident is transnational. Terrorist attacks against foreign diplomats constitute transnational terrorism. Moreover, terrorist events that commence in one country but end in another (e.g., international skyjackings) are transnational terrorist incidents. If a terrorist attack targets an international organization or international peacekeepers, it is a transnational terrorist incident. The 9/11 hijackings are transnational incidents, given that the perpetrators were foreigners, the incident was sponsored from abroad, and the victims hailed from over 80 nations. The spate of kidnappings of Westerners in Lebanon in the 1980s qualifies as transnational terrorism.

On ITERATE and GTD data

Our analysis relies on two terrorist event data sets: ITERATE and GTD. ITERATE gathers its information from the world's newsprint and electronic media. Each data set applies definitions that are not ideal for all uses of the data. ITERATE excludes terrorist incidents associated with declared wars or major military interventions, as well as guerilla attacks on military targets of an occupying force. Thus, terrorist attacks against combatants are excluded; however, terrorist incidents leveled at peacekeepers are included. As such, ITERATE includes the suicide truck bombing of the US Marine barracks in Lebanon on 23 October 1983.

GTD came into existence in 2001 when researchers at the University of Maryland obtained an event database on terrorist incidents, which was originally collected by the Pinkerton

Global Intelligence Services (PGIS) for clients interested in knowing the terrorism risk in different countries (START, 2009b, 2010). PGIS trained primarily retired Air Force personnel to compile the terrorist event database, which, like ITERATE, records the incident's date, country location, type of incident, number of deaths and injuries, and other observations. In 2006, START took over management of the data set and worked on cleaning the data so that it would be more useful to researchers.

There are a few problems with GTD, discussed on the START (2010) website, that are worth noting. PGIS lost the data for 1993 – this box of data fell off of a truck while in transit. START provides an incident total for 1993 without any categorical breakdowns. Additionally, the coding conventions used for 1970–1997 do not match those for 1998 on (START, 2010). A broader-based definition of terrorism was applied by PGIS for the 1970–1997 data (START, 2010); however, there is no documentation provided on how this definition is broader than that used by GTD from 1998 on. START focused on cleaning the post-1997 GTD data. GTD incident counts grew rapidly from 1970 into the early 1980s; this may be due to PGIS acquiring a larger coding staff as the project ensued. It may also be because data in the first part of the 1970s were not recorded in real-time; there is no documentation to know the precise cause. After the PGIS project was well established, we later show that PGIS recorded many more transnational terrorist events than ITERATE. This is likely due to PGIS's broader concept of terrorism that included some attacks against combatants.

A primary difference between GTD and ITERATE involves the number of distinguished attack modes. ITERATE identifies twenty-five distinct attack modes, while GTD indicates only eight alternative attack modes. For instance, GTD combines skyjackings and nonaerial hijackings of buses, trains, and ships under the single category of hijackings. GTD puts all types of bombings (e.g., explosive bombings, incendiary devices, and suicide bombings) into a single

attack mode (START, 2009b). ITERATE distinguishes eight alternative types of bombings. These differences can be easily addressed by aggregating event types in ITERATE to correspond to those in GTD – e.g., bombings and hostage missions. ITERATE covers 1968–2009, while GTD covers 1970–2007. Thus, we compare the two data sets for 1970–2007.

On decomposing GTD into domestic and transnational terrorist events

There are 82,536 ‘terrorist’ incidents in GTD for 1970–2007. We begin by excluding observations that *do not meet* the following three GTD inclusion criteria: (i) the attack is perpetrated for a political, socio-economic, or religious motive; (ii) the attack is intended to coerce, intimidate, or send a message to a wider audience than the immediate victim(s); and (iii) the attack is beyond the boundaries set by international humanitarian law. Next, we purge all terrorist incidents that are defined by the ‘Doubt Terrorism Proper’ determination (START, 2009b). Doubtful observations include incidents involving insurgency or guerilla warfare, internecine conflict, mass murder, and criminal acts. This ability to eliminate doubtful incidents from GTD is only available from 1998 on. We are then left with 66,383 terrorist incidents to classify as domestic or transnational. To identify incidents as transnational, we apply a five-step procedure. Once an incident is identified as transnational at any step, it is removed from the subsequent filters in order to avoid double counting. For example, at the second step, we work only with those incidents that were not identified as a transnational event on the first step. We continue this approach until all five steps are exhausted.

First, we examine the nationality of the victims in relation to the venue country. GTD presents nationality information for up to three victims for a given incident. If the venue country is different than the country of nationality for one or more victims, then the attack is clearly a transnational terrorist incident.⁴ Second, target types are consulted. Attacks against diplomatic

targets are deemed to be transnational incidents because they are carried out against foreign missions, including embassies and consulates. Diplomatic targets also include cultural centers that have diplomatic functions. Terrorist attacks against diplomatic staff, their families, and property are transnational in nature, as are attacks against non-governmental organizations (NGOs), which are multinational entities. Third, we look at target entities in GTD: terrorist attacks against US entities that occurred outside the USA are classified as transnational terrorist events. Similarly, we code terrorist incidents directed at international entities (e.g., UN agencies or NATO infrastructure) and foreign businesses as transnational terrorism. Fourth, we utilize GTD information on US victims, US hostages, and US-specific demands to identify transnational terrorist incidents. A terrorist act that occurs outside of the USA and that involves US fatalities or injuries is classified as transnational. The presence of US hostages in a foreign country also indicates that the terrorist event is transnational. If, in a hostage event outside of the USA, a ransom is demanded from or paid by a US source, then the incident is clearly a transnational terrorist incident. Finally, we use GTD information on the country where kidnappings or hijackings concluded. Any such incidents that involve the diversion of an airplane or resolution in another country, so that two or more countries are involved, are transnational terrorist events. Based on the above five-step procedure, we identify 12,862 transnational terrorist incidents. ITERATE contains 12,784 transnational terrorist incidents for the same time interval. Although the two data sets do not always include the same transnational incidents owing to different sources and coders, it is encouraging that our procedure leads to similar numbers of transnational terrorist incidents.⁵

Next, we identify uncertain incidents from the remaining 53,521 terrorist events in GTD. Whenever there is missing or unknown information regarding the nationality of victims, the target type, or the target entity, then the incident is classified as uncertain. An incident is also

identified as uncertain if there is missing information regarding whether or not there were US fatalities or injuries, US hostages, or ransoms demanded from or paid by US entities in hostage-taking events. In total, 7,108 incidents are determined to be uncertain; there are only 376 uncertain incidents after 1997. The remaining 46,413 incidents are identified as domestic terrorist events because there are no grounds for identifying them as transnational terrorist events.⁶ For these domestic incidents, we know that the venue country matches the nationality of the three identified victims, and that there are no diplomatic or multilateral entities involved. Moreover, US persons or property were not involved on foreign soil in any of these domestic terrorist incidents. Finally, these domestic terrorist incidents do not concern hostage events that included the interests from two or more countries.

When analyzing GTD data, we use just the transnational and domestic terrorist event series. That is, we discard the uncertain event series, which displays little pattern when examined. Based on our decomposition, there are three to four times more domestic than transnational terrorist events in GTD.

The need for both kinds of terrorism data

There are many research questions that require one or both kinds of terrorist incidents. For example, the cause of transnational terrorism will likely differ from that of domestic terrorism. Transnational terrorism is apt to be partly influenced by ‘spillover terrorism,’ where domestic grievances in other countries result in terrorist incidents being staged where the attack captures the most publicity. Throughout the 1970s and 1980s, Western Europe experienced spillover terrorism from the Middle East as terrorist groups staged incidents in major European cities (US Department of State, 1988). There were numerous such incidents in Europe each year during these decades. In contrast, domestic terrorism is generally driven by country-specific separatists

and issue-specific goals (e.g., ending an unpopular war or social justice issues).

When ascertaining the economic impact of terrorism on growth, researchers may find that the two forms of terrorism have diverse marginal impacts. Gaibullov & Sandler (2008, 2011) argued that transnational terrorism is apt to have the greater marginal impact because it may dissuade foreign direct investment, an important source of savings. Moreover, transnational terrorism may be more costly than domestic terrorism to control because border defenses are needed along with homeland security measures. In addition, military action may be required to root out the terrorists in their foreign bases, which entails either costly direct military intervention or assistance to countries to confront their resident terrorists (e.g., US assistance to Yemen). The associated government spending can be a large drain on private investment and, hence, growth (Blomberg, Hess & Orphanides, 2004). Transnational terrorism has a stronger proclivity than domestic terrorism to disrupt the export sector and tourism. For Western Europe, Gaibullov & Sandler (2008) found that transnational terrorism displayed a larger negative and significant marginal impact on growth than domestic terrorism. For Africa, Gaibullov & Sandler (2011) showed that only transnational terrorism had a significant adverse effect on growth.

Empirical studies of counterterrorism measures may also require data that distinguishes between transnational and domestic terrorist attacks. The theoretical literature showed that there is a tendency to overspend on defensive measures and to underspend on proactive responses when countries address a common transnational terrorist threat, such as al-Qaida (Sandler & Lapan, 1988; Sandler & Siqueira, 2006). Defensive overspending occurs as countries attempt to divert the attack abroad; proactive underspending follows as countries try to free ride on other countries' efforts. These tendencies are not anticipated for domestic terrorism because all externalities associated with counterterrorism measures can be internalized by the central

government (Sandler, 2010).

There are many other empirical issues concerning terrorism that require data on both domestic and transnational terrorist incidents. The selected issues here are illustrative.

Comparing GTD and ITERATE time series

Given the inconsistent coding methods associated with GTD, we begin by comparing the quarterly totals of transnational GTD incidents to the numbers of such incidents reported in ITERATE. Because ITERATE uses a consistent coding method throughout its history, we can calibrate GTD to ITERATE. Moreover, ITERATE is widely used and respected.

The first task is to address the missing GTD values for 1993. Although Appendix 1 of the GTD codebook reports that a total of 4,954 incidents occurred in 1993, there are no breakdowns of the individual incidents by type, month, or quarter. Consider the following summary statistics for the total numbers of incidents contained in the two data sets: in 1992, 359 for ITERATE and 4,372 for GTD; in 1993, 553 for ITERATE and 4,954 for GTD; and in 1994, 376 for ITERATE and 2,852 for GTD. Both data sets indicate that a relatively large number of incidents occurred in 1993; hence, it is not advisable simply to interpolate the missing GTD values as the average of the 1992 and 1994 values. Such interpolation would yield 3,612 annual incidents, or 903 incidents per quarter. Instead, we use Equation (1) to obtain the quarterly GTD values of each of the incident types reported in the text:

$$GTD_{1993;i} = (4954/3612)[\mu_{1992} + (i/5)(\mu_{1994} - \mu_{1992})], \quad (1)$$

where $GTD_{1993;i}$ is the interpolated value of any incident type in GTD for quarter i of 1993; μ_{1992} is the quarterly mean value of that incident type for 1992; μ_{1994} is the quarterly mean value of that incident type for 1994; and the subscript i runs from 1 to 4. For example, $\mu_{1992} = 1,093$ and

$\mu_{1994} = 713$ for all incidents. The interpolated values for all incidents for quarters 1 to 4 of 1993 are: 1,395.61; 1,291.44; 1,187.27; and 1,083.11, respectively. When we apply Equation (1) to the decomposed values of domestic terrorist incidents, transnational terrorist incidents, and unknown terrorist incidents, we derive Table I.

Table I in here

The time series plots of the quarterly number of transnational incidents contained in the two data sets are shown in Figure 1. There are several important features to note:

- From 1970:1 through 1977:2, the number of incidents in ITERATE consistently exceeds that in GTD. The mean number of quarterly incidents for ITERATE is 94.67, while the mean number of quarterly incidents for GTD is 45.93.
- From 1977:3 through 1991:1 the incident totals are quite similar; however, beginning in 1991:2, the number of transnational terrorist incidents in GTD greatly exceeds those in ITERATE.
- In 1998:1, there is a sharp decline in the number of GTD transnational terrorist incidents, resulting from a change in the method of coding the data. Interestingly, the decline in the number of transnational incidents is such that GTD and ITERATE track one another quite well beginning in 1998:1 until 2004:4.
- Beginning in 2005:1, the data sets begin to diverge. The divergence stems from GTD reporting more attacks occurring in Iraq and Afghanistan than does ITERATE. Apparently, GTD does not exclude terrorist attacks against combatants in these two countries, as does ITERATE.

Figure 1 in here

Each of the data sets has its own idiosyncrasies and neither is a perfect measure of transnational terrorism. Nevertheless, because ITERATE used a consistent coding method over the entire period, it is likely to capture the general movements in the number of transnational incidents more accurately than GTD. As such, one reasonable strategy for users of GTD is to scale up the numbers of pre-1977:2 transnational terrorist incidents in the GTD data set by a factor of about 2.06 ($= 94.67/45.93$), which is the ratio of the mean number of ITERATE incidents to the mean number of GTD transnational terrorist incidents for 1970:1–1977:2. Given that the entries in GTD are clearly overinflated for 1991:2–1997:4, we recommend deflating the numbers of transnational GTD entries from this period by a scale factor of 0.52, equal to the ratio of ITERATE to GTD incident means for this period.

Table II in here

The first two rows of Table II indicate the mean number of domestic and transnational terrorist incidents in GTD for five key periods, while the third row shows the corresponding mean number of transnational incidents in ITERATE. Notice that the third column reports the full sample period 1970:1–2007:4, and columns 4, 5, and 7 report the nonoverlapping subperiods 1970:1–1977:2, 1977:3–1997:4, and 1998:1–2007:4. Column 6 reports the subsample for which there seems to be the greatest disparities between the two data sets: 1991:2–1997:4. Table II also provides quarterly means for incidents with casualties (i.e., at least one fatality or injured person) and incidents with deaths (i.e., at least one fatality) during select periods.

Insofar as ITERATE contains only transnational incidents, it would be desirable to have adjustment factors other than 2.06 and 0.52 for the two suspect periods to apply to the domestic GTD entries. However, since it is inappropriate to simply use the unadjusted data, we should anticipate similar biases to characterize GTD's domestic event counts for 1970:1–1977:2 and 1991:2–1997:4. We, therefore, apply our mean ratio adjustments to GTD domestic terrorist incidents; the implicit assumption is that PGIS coders improperly missed (or padded) the number of domestic and transnational terrorist incidents proportionately.

Figure 2 in here

Figure 2 shows the effects of modifying the GTD data as suggested. After the adjustment, the quarterly number of transnational terrorist incidents in the two data sets tracks one another quite well. We do not recommend adjusting the post-2004 counts because they primarily result from slightly different coding conventions by GTD concerning the treatment of attacks against military personnel in Iraq and Afghanistan.

Enders and Sandler (2006) discussed a problem present in nearly all terrorism data sets that include threats (promised future actions) or hoaxes (falsely claimed past actions). In particular, the time series of threats and hoaxes consists largely of noise. The general threats issued by a group, such as al-Qaida, are often too vague to be included in a count data set. Moreover, as terrorism has become more deadly, recent threats and hoaxes are likely to be overlooked in compiling a chronology of terrorism incidents. Generally, counts of incidents involving deaths and casualties are likely to be more accurate than counts of all incidents that include inconsequential attacks or threats. More media reporting effort and coder care will go into recording consequential attacks.

Figure 3 in here

Figure 3 shows the quarterly number of transnational terrorist incidents with casualties contained in ITERATE and GTD. For both data sets, the number of incidents shown in Figure 3 is far less than those previously displayed in Figures 1 and 2. Nevertheless, the same broad relationships between the two casualty series are not very different from those described above. In particular, we see that:

- Over 1970:1–1977:2, the ratio of ITERATE to GTD incidents is 2.11: the mean number of transnational casualty incidents is 20.87 in ITERATE, while it is 9.90 in GTD – see Table II.
- The two series track quite well for 1977:3–1991:1 and then the GTD series surges upward. The GTD totals exceed those of ITERATE until about 1998:1. From 1991:2 to 1997:4, the ratio of the means for ITERATE to GTD casualty incidents is 0.66.

Figure 4 in here

When only transnational terrorist incidents with deaths are included, the two series in Figure 4 track one another closely. The important exceptions are the 1991:2–1997:4 and the post-2004:4 sample periods. For 1991:2–1997:4, the ratio of means for ITERATE to GTD transnational terrorist incidents with deaths is 0.43 (= 19.93/46.28) in Table II.

GTD incident types

Figure 5 overlays the time paths of the domestic and transnational casualty incidents, constructed from the raw (i.e., not calibrated) GTD data; Figure 6 overlays time paths of domestic and

transnational death incidents from the raw GTD data. The left-hand scale in Figures 5 and 6 corresponds to the quarterly number of domestic terrorist incidents, while the right-hand scale corresponds to the quarterly number of transnational terrorist incidents. The two casualty series and the two death series track one another strikingly well.

Figures 5 and 6 in here

Figure 7 classifies the number of domestic to transnational incidents by attack mode for GTD. Panel a shows domestic and transnational assassinations (assn.); Panel b displays bombing incidents; Panel c depicts armed attacks (armed); and Panel d presents hostage takings. The series are overlaid so that the left-hand scale is for domestic terrorist incidents, and the right-hand scale is for transnational terrorist incidents. A notable feature of the figure is that domestic and transnational terrorist bombings are tightly connected. However, hostage takings are likely mis-coded because there are very few domestic incidents recorded through mid-2005.⁷ The time paths of the incidents in the neighborhood surrounding 1997:4 suggest that new coding conventions appear to be associated with assassinations, armed attacks, and hostage taking after 1997:4, but not with bombings.

Figure 7 in here

On the dynamic relationship of domestic and transnational terrorism

Using our division of GTD, we present a novel analysis of the dynamic relationship of domestic and transnational terrorist events. One way to measure the strength of the dynamic relationships between the various types of domestic and transnational incidents is to use cross-correlations.

For All, Casualty, Death, Assassinations, Armed Attacks, and Bombings incident series, Table III reports the cross-correlations (ρ) between the domestic and transnational counterparts of a given incident type. Because the correlations might change as a result of different coding conventions in the GTD data set, we report cross-correlations for the same sample periods considered in Table II, using the calibrated data. Insofar as the relationship between domestic and transnational incidents can occur with a lag, we report the contemporaneous cross-correlations, denoted by ρ_0 , as well as the first three lagged cross-correlations, denoted by ρ_i , $i = 1, 2, 3$.

There are many grounds for anticipating correlations between domestic and transnational terrorist incidents. First, planned domestic terrorist incidents may occasionally result in collateral damage to foreign interests, thereby giving rise to transnational terrorist events. Second, a domestic campaign may begin to include transnational terrorist attacks in order to garner greater media attention. Third, domestic terrorists may seek safe havens in nearby countries. As they subsequently cross a border to attack their home country, a transnational terrorist incident ensues. Fourth, domestic terrorist incidents may have a demonstration effect on transnational terrorist incidents and vice versa as terrorists and authorities copy one another's innovations. Fifth, terrorists seek soft targets, which may mean that the type of attack at a given time may result from the greater target of opportunity. Sixth, political events – e.g., the Arab-Israeli wars or the US retaliatory raid on Libya in April 1986 – may generate backlash that gives rise to domestic and transnational terrorist incidents. Common grievances against governments may result in campaigns by both domestic and transnational groups.

Table III in here

As suggested by Figures 5, 6, and 7, the values of ρ_0 are generally sizable. For example, over the full sample period, the contemporaneous cross-correlation is 0.46 for Casualty incidents and 0.53 for Death incidents. The smaller contemporaneous cross-correlation for the 1977:3–1997:4 period is due to calibration, which scales down incident totals.⁸ Although the values of ρ_0 are fairly robust to the sample period, there is a tendency for the strength of the association to decline during 1977:3–1997:4 and 1991:2–1997:4. The cross-correlation for bombings, a ρ_0 value of -0.02 for 1977:3–1997:4, is very surprising, since a higher contemporaneous correlation is anticipated. Primarily as a result of events in Iraq and Afghanistan, the bombing cross-correlation jumps to 0.54 for 1998:1–2007:4. During this period, the terrorists hit both domestic and transnational targets.

The lagged values of the cross-correlations tell an interesting story. For example, over 1998:1–2007:4, the value of ρ_0 for Death incidents is 0.57; however, the values of ρ_1 to ρ_3 do not show a pronounced tendency to decay. One explanation is that lagged values of domestic incidents with deaths actually induce subsequent transnational Death incidents.

For the 1991:2–1997:4 subperiod, some of the correlations are negative. Figures 5 and 6 indicate that the number of domestic casualty and death incidents began to decline in the early 1990s; however, the number of transnational casualty and death incidents climbed to near-record levels during this period. This would account for these negative correlations. Figure 7 indicates that this same pattern held for armed attacks and for bombings. In the case of assassinations, domestic incidents rose in 1994 while transnational incidents continued to decline, which would explain the negative correlations in this subperiod.

The relatively large and stable values of many of the ρ_0 provide some justification for applying our calibration method, obtained from the transnational data, to the domestic incidents

in GTD.

A VAR analysis

A more systematic way to consider the contemporaneous and lagged relationships among a number of variables is to use a VAR model. Consider the form of a two-variable VAR involving the number of domestic and transnational casualty incidents (excluding incidents in Iraq and Afghanistan):

$$trans_t = A_{11}(L)trans_{t-1} + A_{12}(L)dom_{t-1} + \varepsilon_{1t}, \quad (2)$$

$$dom_t = A_{21}(L)trans_{t-1} + A_{22}(L)dom_{t-1} + \varepsilon_{2t}, \quad (3)$$

where $trans_t$ is the number of transnational terrorist incidents in quarter t ; dom_t is the number of domestic terrorist incidents in quarter t ; the $A_{ij}(L)$ terms are polynomials in the lag operator L ; ε_{1t} and ε_{2t} are serially uncorrelated and identically distributed disturbances; and the intercepts are suppressed for simplicity. As detailed in Enders (2010), the nature of a VAR system is that the contemporaneous value of each variable depends on its own lagged values and on those of the other variable(s). In Equations (2) and (3), any contemporaneous relationship between $trans_t$ and dom_t is captured by the contemporaneous correlation between ε_{1t} and ε_{2t} .

We select the 1979:4–2007:4 sample period because, as can be seen in Figure 5, our weight factor for pre-1977:3 seems to be somewhat inconsistent relative to the data in the latter periods. We begin the estimation at 1979:4 (instead of 1977:3), because this is the date that Enders & Sandler (2000) empirically associated with the onset of a significant increase in fundamentalist terrorism, corresponding to the takeover of the US embassy in Teheran and the Soviet invasion of Afghanistan.

As a preliminary step toward properly specifying the form of the VAR, we perform

Dickey-Fuller (DF) and Dickey-Fuller-Generalized Least Squares (DF-GLS) unit root tests on the $trans_t$ and dom_t series. Consider the following specification:

$$\Delta y_t = a_0 + \gamma y_{t-1} + \sum a_i \Delta y_{t-i} + \varepsilon_t, \quad (4)$$

where y_t can be $trans_t$ or dom_t ; t denotes a particular time period; a_0 , γ , and a_i s are coefficients; and ε_t is an error term.

Because the $trans_t$ or dom_t series both appear to have very slight downward drifts over our sample period, we perform the tests with and without the time trend, t . In neither case is the trend statistically significant; hence, the trend is not subsequently considered. We use the general-to-specific method to determine the appropriate lag length. Specifically, beginning with a lag length of $p = 4$, we estimate an equation in the form of Equation (3). If the coefficient on a_p is insignificant at the 5% level, we then reduce the lag length by one and repeat the estimation until we find a significant lag. Using this lag length, Table IV reports the t-statistic for the null hypothesis that $\gamma = 0$. In general, standard Dickey-Fuller tests do not allow us to reject the null hypothesis of a unit root. Because the test results are very sensitive to the starting date used in the estimation, we also apply the more powerful GLS version of the test. As shown in Table IV, the null of a unit root can, in all but one instance, be rejected at the 10% level (and usually at the 5% level) for the DF-GLS form of the test. As a robustness check, we report unit root tests for the ratio of transnational to domestic incidents ($ratio_t = trans_t/dom_t$), the logarithm of the ratio, and the difference between the series ($diff_t = dom_t - trans_t$). Conditional on these findings, we first estimate the VAR in the form of Equations (2) and (3) using the levels, and not the first-differences, of the variables.

Table IV in here

The results of the Granger-causality tests are quite interesting. Let F_{ij} be the sample value of the F -statistic that all coefficients of $A_{ij}(L)$ are equal to zero. The four values of F_{ij} (with *prob*-values in parentheses) are $F_{11} = 23.786$ (0.000), $F_{12} = 4.057$ (0.009), $F_{21} = 1.668$ (0.178), and $F_{22} = 41.182$ (0.000). Hence, domestic terrorist incidents Granger-cause themselves as well as transnational terrorist incidents, while transnational terrorist incidents Granger-cause themselves but not domestic incidents.

Next, we perform innovation accounting by obtaining the impulse responses and variance decompositions from a Choleski decomposition of the regression residuals. Insofar as we have no *a priori* knowledge of the causal ordering, we present results using both orderings. Two sets of results are similar since the contemporaneous correlation coefficient of the two regression residuals is 0.14.

Figure 8 in here

The four panels of Figure 8 show the impulse responses, when we assume that dom_t is causally prior to $trans_t$. The solid lines in the figure are the impulse responses, and the dashed lines represent ± 2 standard deviation confidence bands. As shown in Panel a, a one-standard deviation shock to dom_t (= 46.85 incidents per quarter) is quite persistent with the subsequently induced shocks remaining statistically significant until quarter 10. In contrast, Panel b indicates that $trans_t$ shocks have little impact on dom_t . Perhaps the most interesting result is in Panel c. At first, a domestic shock has a small significant impact on $trans_t$; however, by quarter 4, the domestic shocks appear to ‘spill over’ into $trans_t$, inducing about two additional transnational incidents per quarter. This delayed impact is quite persistent. In Panel d, we see that a transnational shock has an extended influence on $trans_t$; however, the decay seems to be faster

than that of dom_t . As indicated in Figure 9, very little of substance changes when we reverse the causal ordering.

Figure 9 in here

The top portion of Table V shows the variance decompositions when we assumed that dom_t is causally prior to $trans_t$. The important feature of the table is that shocks to dom_t have a modest contemporaneous effect on the forecast error variance of $trans_t$. However, the proportion rises sharply so that by 10 quarters dom_t shocks explain as much as 35% of the forecast error variance of $trans_t$. By contrast, shocks to $trans_t$ never explain as much as 3% of the forecast error variance of dom_t . As shown in the lower portion of the table, little is changed when we reverse the causal ordering.

Table V in here

These results have important policy implications in terms of where to concentrate counterterrorism resources in the war on terrorism. Countries plagued by transnational terrorist attacks to their interests at home or abroad cannot ignore a flare-up of domestic terrorism, because such contingencies raise transnational terrorist attacks with a lag. That is, the rise of domestic terrorism in West Germany in the late 1960s and early 1970s eventually resulted in more transnational terrorist attacks in Europe and elsewhere. In Spain, Euskadi ta Askatasuna (ETA) turned to transnational terrorism leveled against tourist hotels and venues when the government held firm in the 1980s (Mickolus et al., 1989). Palestinian groups also resorted to transnational terrorist attacks to enhance their visibility when there was little response to their domestic terrorist attacks. There are many other examples in Lebanon, Egypt, Italy, Chechnya,

Yemen, and elsewhere of domestic shocks influencing transnational terrorist incidents. Our results are particularly interesting because it identifies the spillover being from domestic terrorism shocks to transnational terrorism. The reverse spillover is barely evident.

Cointegration as a diagnostic check

Given the possibility that the variables are nonstationary, the results in Table IV suggest that there is a combination of the variables (or their logarithms) that is stationary. As such, if both variables are actually unit root processes, they should be cointegrated. When we formally test for the presence of a cointegrating relationship using the Engle-Granger methodology, the long-run equilibrium relationship is:

$$trans_t = 11.17 + 0.088dom_t + e_t, \quad (5)$$

where e_t is the deviation from long run-equilibrium. Estimating the short-run dynamics yields:

$$\Delta e_t = -0.275e_{t-1} - 0.377\Delta e_{t-1}. \quad (6)$$

The t -statistic for the null hypothesis of no cointegration is -3.26 , whereas the 5% critical value is -3.40 . When we reverse the order of the variables in Equation (3), this results in a t -statistic for the null of no cointegration equal to -3.33 . Hence, there is some evidence that the variables are cointegrated using a *prob*-value of slightly more than 5%. However, the Johansen cointegration test strongly indicates the presence of one cointegrating vector when we allow for an intercept in the cointegrating vector or for an unrestricted drift term. For example, when we include a constant in the cointegrating vector, the ordered sample values of λ_{trace} are 24.61 and 6.74, and the ordered sample values of λ_{max} are 17.87 and 6.74. Comparing these to the critical values of the Johansen test, we conclude that there is a single cointegrating vector. We next reparameterize Equations (2) and (3) such that:

$$\Delta trans_t = -0.038ec_{t-1} + B_{11}(L)\Delta trans_{t-1} + B_{12}(L)\Delta dom_{t-1} + \varepsilon_{1t}, \quad (7)$$

$$\Delta dom_t = -0.653ec_{t-1} + B_{21}(L)\Delta trans_{t-1} + B_{22}(L)\Delta dom_{t-1} + \varepsilon_{2t}, \quad (8)$$

where ec_{t-1} is the error correction term from Equation (5) ($trans_{t-1} - 11.17 - 0.088dom_{t-1}$), and the $B_{ij}(L)$ s are polynomials in the lag operator L .

A key result is that the t -statistics of the error-correction terms in Equations (7) and (8) are -4.367 and -0.069 , respectively. Moreover, the sample value of F for the null hypothesis that all values of $B_{21}(L) = 0$ is 1.80 and the associated *prob*-value is 0.170 . As such, the Johansen methodology reinforces that transnational terrorism responds to domestic terrorism, but that domestic terrorism does not respond to transnational terrorism.

Concluding remarks

Our analysis of GTD data is, in part, intended to make the data useful to researchers who require a long time series that distinguishes between domestic and transnational terrorist incidents. To achieve this purpose, we devised a means for separating GTD incidents into domestic and transnational terrorist incidents, consistent with these data sets' definition of such incidents. Next, we addressed coding inconsistencies and other issues in GTD with a calibration method that first calibrates transnational terrorist incidents in GTD to those in ITERATE, where a consistent coding technique had been used since its inception. The same calibration was then applied to domestic terrorist incidents in GTD. A sequence of graphical displays were presented to judge our calibration and to view the time-series dynamics. This comparison included important component time series from GTD and ITERATE.

The last portion of the paper investigated the dynamics and the interrelationship of domestic and transnational terrorist incidents using the calibrated GTD data. We uncovered significant contemporaneous and lagged cross-correlations between overall domestic and

transnational terrorist incidents using the adjusted GTD data. We also found evidence of these cross-correlations for component time series. These cross-correlations indicate that domestic and transnational terrorist events are interrelated not only contemporaneously but also in terms of past events. The influence in some instances fades slowly. Thus, domestic terrorism cannot be treated as an isolated problem.

This last point became clearer when we performed Granger-causality tests. Domestic terrorist events Granger-cause domestic and transnational terrorist incidents, but transnational terrorist events only Granger-cause themselves. The impulse response analysis supports this finding. Shocks to domestic terrorist events impact transnational terrorism out to ten quarters into the future. This realization means that prime-target countries for transnational terrorism must devise counterterrorism policies that also account for the spillover of domestic terrorism. Thus, prime targets of transnational terrorism must help contain domestic terrorist campaigns abroad before they spill over into transnational terrorism. This may involve the allocation of counterterrorism-based foreign aid to countries confronting domestic terrorism. In other cases, it may require military intervention or other kinds of assistance. The exact form of such help would be better understood if researchers can ascertain which countries' domestic terrorism has the greatest impact on transnational terrorism.

Replication data

Full replication data and do-files are available at www.prio.no/jpr/datasets.

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Footnotes

1. Gaibullov & Sandler (2008) managed to merge ITERATE and TWEED for 1971–2004, thereby distinguishing transnational and domestic terrorist events during this period for Europe.

2. LaFree, Yang & Crenshaw (2009) distinguished between transnational and domestic terrorist attacks for just 16,916 incidents involving 53 anti-US terrorist groups. Their method is somewhat analogous to our technique, described below. In a recent paper, Kis-Katos, Liebert & Schulze (2010) dichotomized fewer terrorist incidents by using the perpetrating group's identity, when known. These authors first assigned known groups to a base country, regardless of the perpetrators' nationality or the existence of multiple bases. If these groups either attacked outside their base country of operations or targeted foreign interests inside their base country of operation, then the attacks were classified as transnational. Their method could dichotomize 49,192 terrorist events from GTD, while our method could classify over 66,000 terrorist events from GTD. More important, Kis-Katos, Liebert & Schulze (2010) used domestic terrorist events as the default when the true perpetrating group *was not known* – this involves well over 32,000 terrorist incidents! See footnote 3 for further remarks about perpetrating groups.

3. One referee made an interesting suggestion for us to distinguish the two types of events based on the *intention* of the perpetrating group. This has some drawbacks. Within GTD, over 32,000 events have no perpetrating group listed. In many instances, a nonspecific group – e.g., rebel, activist, or youth – is listed. Multiple groups may be listed if more than one claimed responsibility. The intention of some groups is difficult to discern and may morph over time. Moreover, the nationality of the perpetrator may be different than that of the perpetrating group, which can pose a classification problem if a domestic group has foreign operatives but 'domestic intentions.'

4. GTD codes the West Bank and the Gaza Strip as separate from Israel. However, we identify an incident occurring in Israel, the West Bank, or the Gaza Strip as transnational terrorism only when a victim is neither Israeli nor Palestinian. This convention is consistent with ITERATE, which does not treat the West Bank and the Gaza Strip as separate countries.

5. After interpolating the GTD data for 1993, the cross-correlations between the ITERATE and GTD transnational terrorism series are 0.435, 0.454, and 0.451 for the All, Casualty, and Death incident series, respectively. Thus, the overlap between the two series is rather modest.

6. There is still a possibility that some of the 46,413 domestic terrorist incidents may include transnational attacks. The final step required to separate domestic from transnational terrorist incidents involves using the nationality of the perpetrators. Unfortunately, this variable is not recorded in GTD. We could look at the name of the perpetrating groups, when recorded, but this would not provide the nationality of the terrorists for specific attacks. That is, transnational terrorist groups may use local (homegrown) terrorists to carry out an attack – e.g., this was true for the London transport suicide attacks on 7 July 2005.

7. The undercounting of domestic hostage events by GTD prior to 1997 is likely due to ennuui by PGIS clients for this information, because such incidents posed no risk to foreign client firms.

8. Because multiplying a series by constant scaling factor will not change the correlations, the calibrated and unadjusted data provide the same correlation values for 1970:1–1977:4 and 1991:2–1997:4. These correlations are also the same for 1998:1–2007:4, for which there is no calibration.

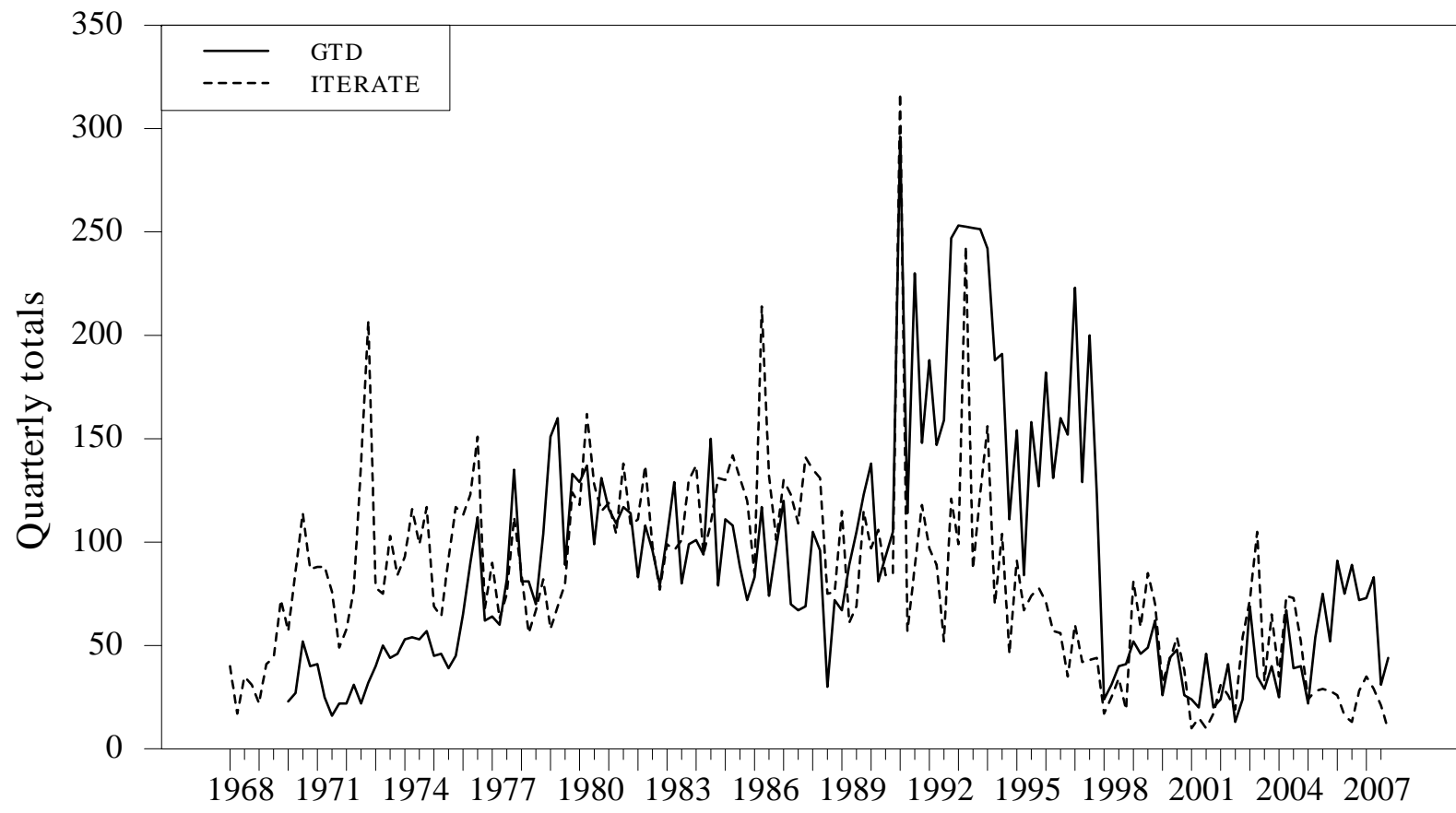


Figure 1. Transnational incident totals

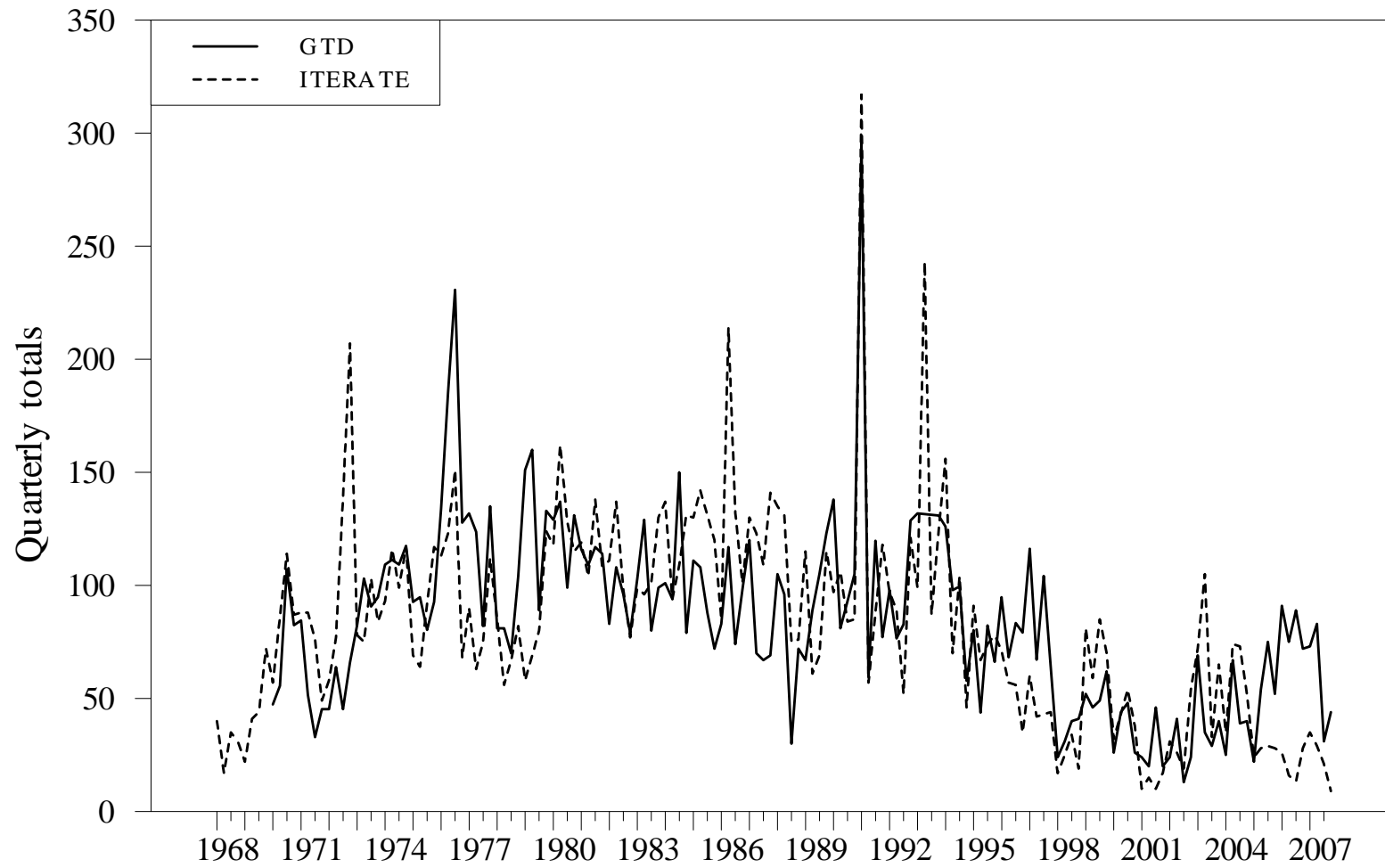


Figure 2. Transnational incident totals with the modified GTD data

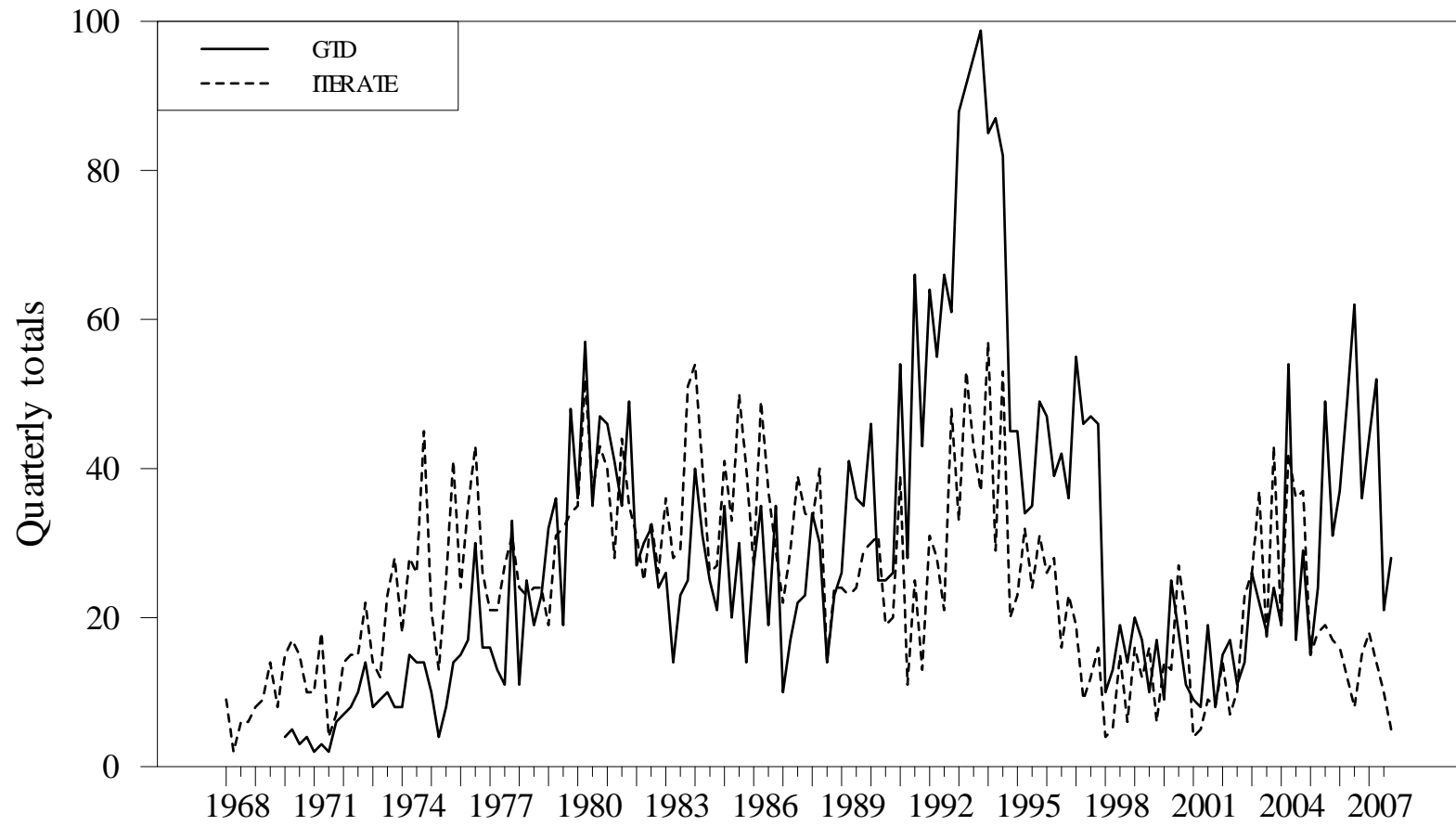


Figure 3. Transnational incidents with casualties

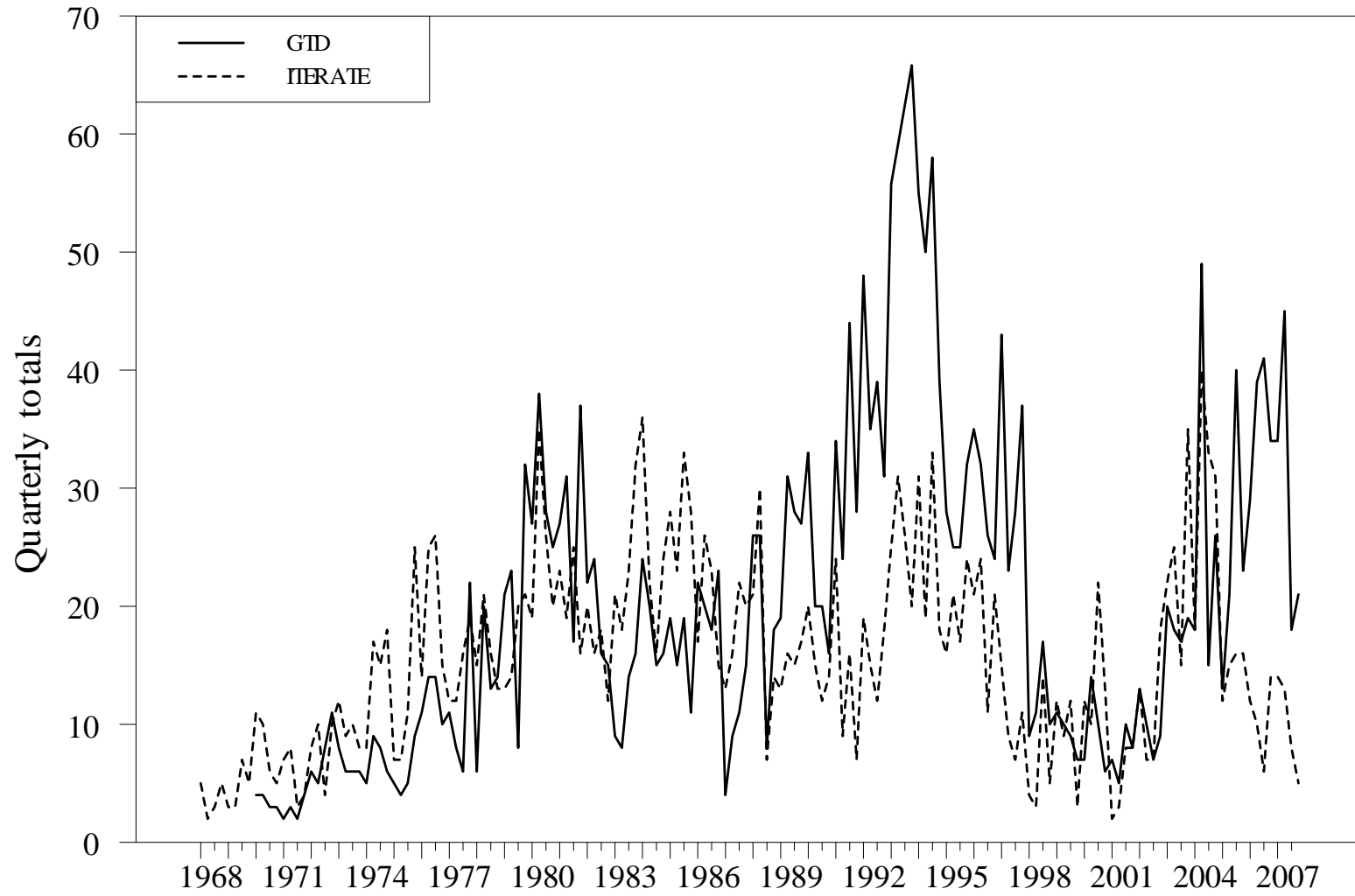


Figure 4. Transnational incidents with deaths

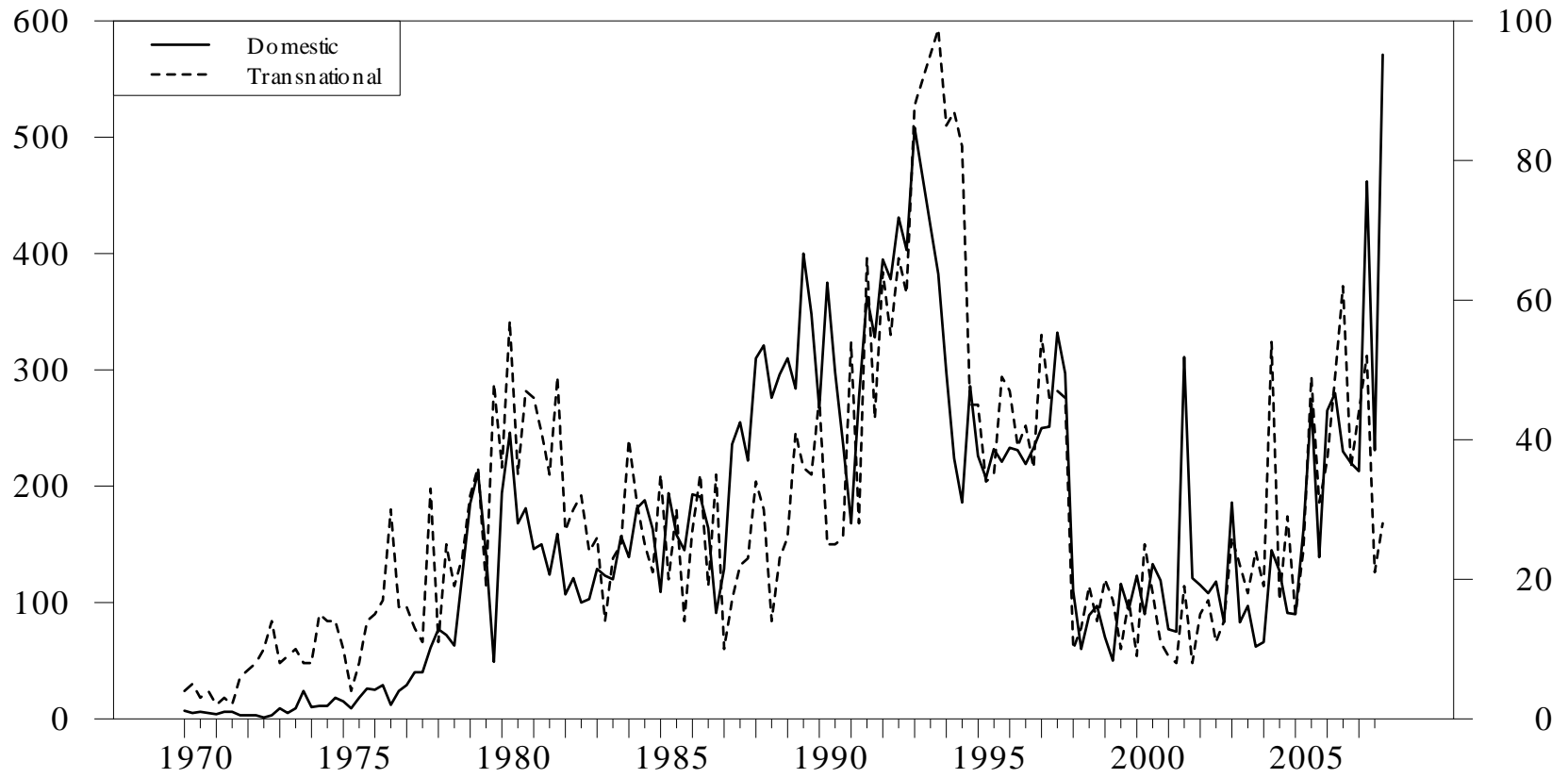


Figure 5. Overlay of domestic and transnational casualty incidents

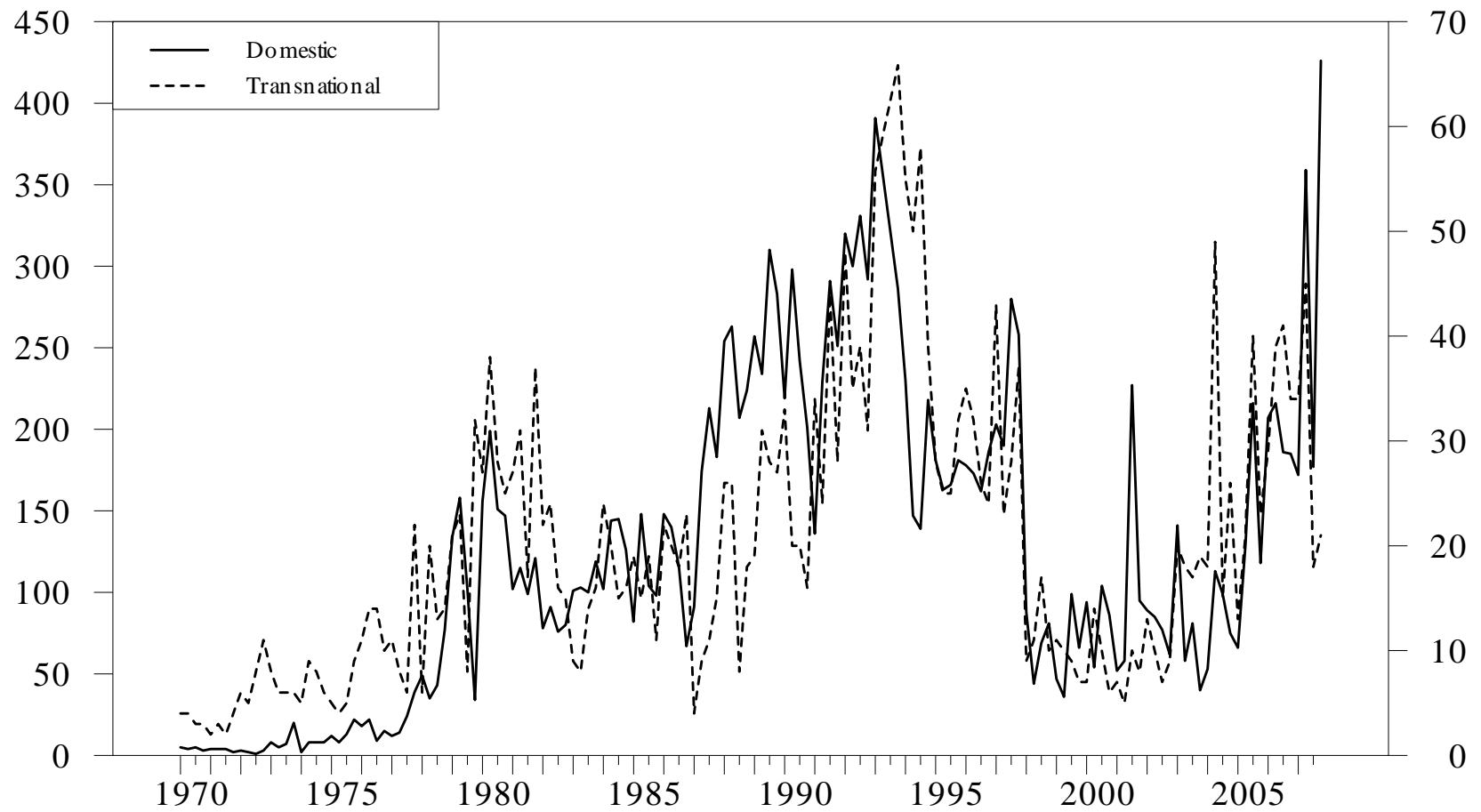


Figure 6. Overlay of domestic and transnational death incidents

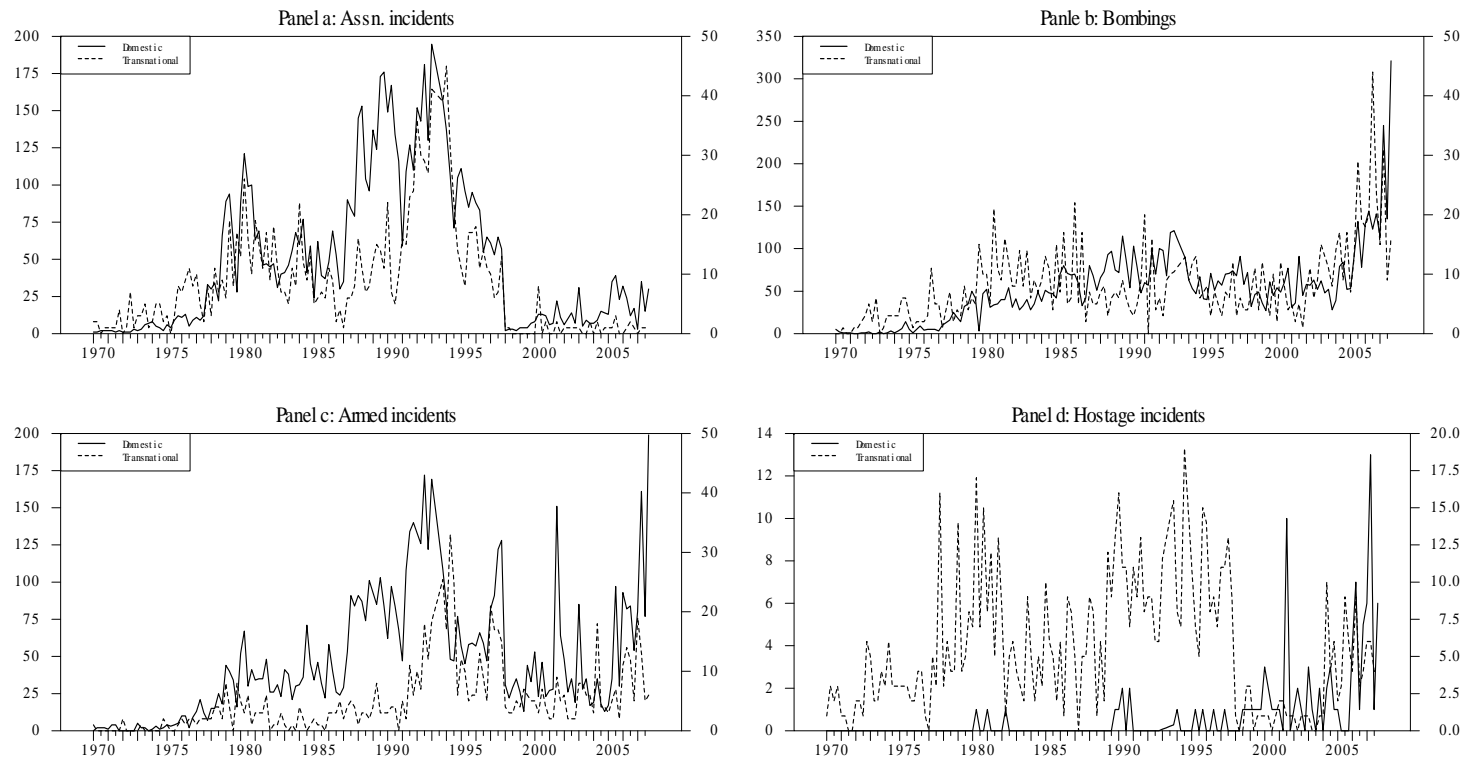


Figure 7. GTD incident types

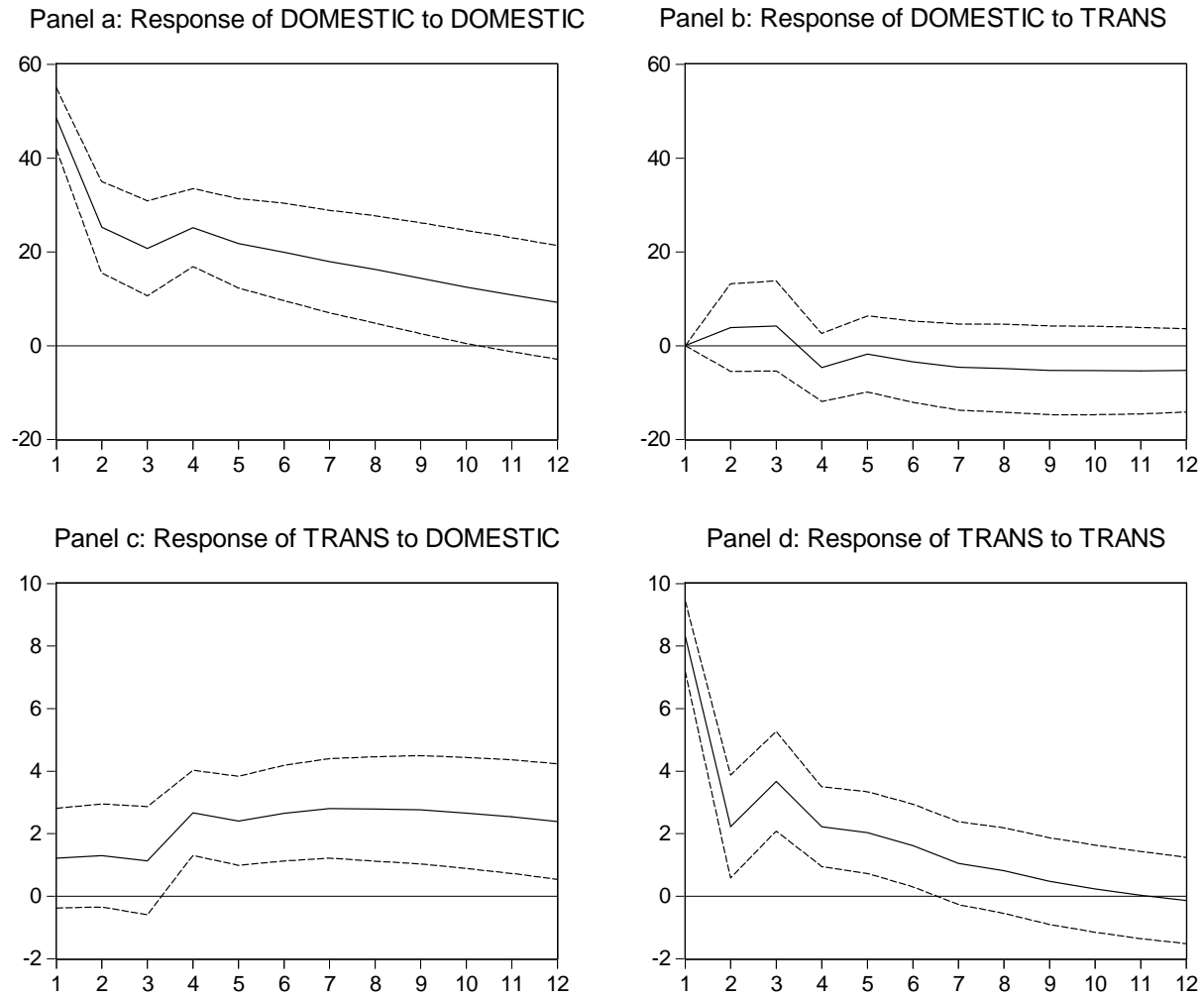


Figure 8: Impulse responses with domestic causally prior to transnational

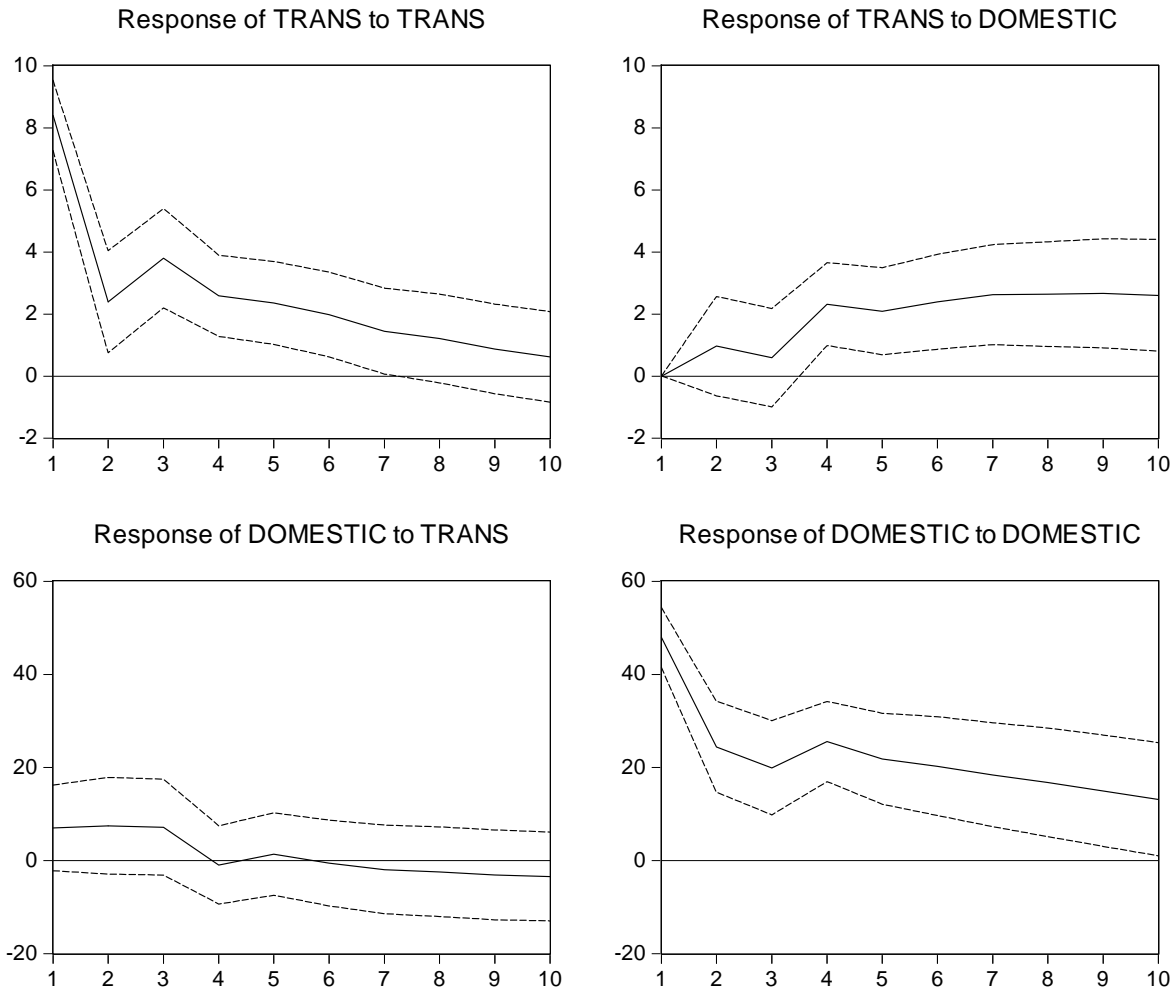


Figure 9. Impulse responses with transnational causally prior to domestic

Table I. Quarterly totals for the three types of terrorist events in 1993

	<i>Domestic</i>	<i>Transnational</i>	<i>Unknown</i>	<i>Total</i>
1993:1	1006.85	253.46	135.30	1395.61
1993:2	909.26	252.84	129.34	1291.44
1993:3	811.68	252.23	123.37	1187.27
1993:4	714.09	251.61	117.40	1083.11

Table II. Sample quarterly means of incident types in GTD and ITERATE

<i>Time Series</i>		<i>1970:1 to 2007:4</i>	<i>1970:1 to 1977:2</i>	<i>1977:3 to 1997:4</i>	<i>1991:2 to 1997:4</i>	<i>1998:1 to 2007:4</i>
All	Domestic	325.95	47.37	466.09	713.60	223.33
	Transnational	90.11	45.93	123.83	198.27	46.39
	ITERATE	84.13	94.67	98.93	103.40	39.97
Casualty	Domestic	152.93	12.53	198.55	252.53	160.94
	Transnational	27.28	9.90	34.47	50.93	24.58
	ITERATE	25.09	20.87	29.77	33.47	17.44
Death	Domestic	125.96	8.37	167.99	273.48	123.56
	Transnational	20.19	6.67	25.41	46.28	18.97
	ITERATE	16.24	11.23	18.76	19.93	14.42

Table III. Cross-correlations of domestic and transnational incidents

<i>Time Series</i>		<i>1970:1</i>	<i>1970:1</i>	<i>1977:3</i>	<i>1991:2</i>	<i>1998:1</i>
		<i>to</i>	<i>to</i>	<i>to</i>	<i>to</i>	<i>to</i>
		<i>2007:4</i>	<i>1977:2</i>	<i>1997:4</i>	<i>1997:4</i>	<i>2007:4</i>
All	ρ_0	0.32	0.47	0.15	0.57	0.53
	ρ_1	0.26	0.56	0.04	0.35	0.20
	ρ_2	0.23	0.70	-0.09	0.22	0.35
	ρ_3	0.25	0.82	-0.10	0.04	0.43
Casualty	ρ_0	0.46	0.49	0.27	0.57	0.55
	ρ_1	0.39	0.60	0.21	0.31	0.37
	ρ_2	0.39	0.57	0.11	0.19	0.51
	ρ_3	0.33	0.61	-0.08	-0.10	0.55
Death	ρ_0	0.53	0.55	0.34	0.45	0.57
	ρ_1	0.44	0.46	0.26	0.12	0.40
	ρ_2	0.46	0.35	0.14	0.03	0.57
	ρ_3	0.39	0.34	0.00	-0.24	0.50
Assassinations	ρ_0	0.60	0.65	0.43	0.85	0.22
	ρ_1	0.56	0.53	0.36	0.70	0.05
	ρ_2	0.51	0.45	0.23	0.57	0.08
	ρ_3	0.46	0.30	0.12	0.42	0.03
Armed Attacks	ρ_0	0.47	0.50	0.28	0.12	0.47
	ρ_1	0.37	0.45	0.24	-0.05	0.22
	ρ_2	0.31	0.40	0.18	-0.07	0.15
	ρ_3	0.28	0.35	0.00	-0.31	0.34
Bombings	ρ_0	0.46	0.31	-0.02	0.30	0.54
	ρ_1	0.36	0.44	-0.06	0.03	0.38
	ρ_2	0.50	0.14	-0.02	0.06	0.64
	ρ_3	0.44	0.39	-0.08	-0.31	0.56

Table IV. ERS unit root tests for the modified domestic and transnational casualty series

<i>Series</i>	1978:1	1979:1	1980:1	1981:1	1982:1
<i>dom_t</i>	-1.73	-2.25	-2.11	-2.06	-1.76
<i>trans_t</i>	-1.94	-2.32	-2.17	-1.45*	-2.34
<i>ratio_t</i>	-5.90	-5.47	-7.51	-4.23	-4.66
$\log(\text{ratio}_t)$	-4.53	-4.22	-4.43	-4.00	-4.32
<i>diff_t</i>	-1.93	-2.40	-2.27	-2.02	-1.82

Entries are the t -statistics for the null hypothesis that $\gamma = 0$, using the DF-GLS test. The 1%, 5% and 10% critical values for the DF-GLS test are -2.58 , -1.95 and -1.62 , respectively. Note that all entries, except the one marked with a *, are significant at the 10% level.

Table V. Variance decompositions

<i>Steps</i>	<i>Decomposition of Transnational</i>		<i>Decomposition of Domestic</i>	
	<i>% due to Trans</i>	<i>% due to Domestic</i>	<i>% due to Trans</i>	<i>% due to Domestic</i>
Ordering is such that Domestic is Causally Prior to Transnational				
1	97.915	2.085	0.000	100.000
2	95.907	4.093	0.493	99.507
3	95.165	4.835	0.937	99.063
4	88.901	11.099	1.313	98.687
5	84.797	15.203	1.246	98.754
6	80.283	19.717	1.385	98.615
7	75.682	24.318	1.693	98.307
8	71.628	28.372	2.024	97.976
9	68.002	31.998	2.416	97.584
10	64.928	35.072	2.813	97.187
Ordering is such that Transnational is Causally Prior to Domestic				
<i>Steps</i>	<i>Decomposition of Transnational</i>		<i>Decomposition of Domestic</i>	
	<i>% due to Trans</i>	<i>% due to Domestic</i>	<i>% due to Trans</i>	<i>% due to Domestic</i>
1	100.000	0.000	2.085	97.915
2	98.796	1.204	3.482	96.518
3	98.608	1.392	4.507	95.493
4	93.614	6.386	3.810	96.190
5	90.354	9.646	3.453	96.547
6	86.471	13.529	3.175	96.825
7	82.194	17.806	3.043	96.957
8	78.317	21.683	2.995	97.005
9	74.694	25.306	3.042	96.958
10	71.523	28.477	3.149	96.851