Simultaneous Attacks by Terrorist Organisations

by Kathleen Deloughery

Abstract

While terror attacks that are a part of a coordinated effort receive attention in the popular media, they have not received much attention in the academic literature. The decision to carry out simultaneous attacks should be examined as one of the choices a terrorist organisation makes about the method of attack. Determining the impact of simultaneous attacks vis-à-vis a single attack can explain why groups would use this method. Up to one quarter of all attacks coded in two major databases, GTD and ITERATE, may be part of a simultaneous campaign. Empirical analysis shows simultaneous attacks are more likely to be successful and cause more fatalities, though not in a one-to-one fashion. These results underline the importance of considering simultaneous attacks in empirical analysis.

Keywords: *violence, data analysis, database, impacts of terrorism*

Introduction

Why do some terrorist organisations group their attacks close together, while others spread them out? For instance, Al-Qaeda is well known for carrying out simultaneous attacks—that is, having different terror cells hit more than one location at approximately the same time. It is accepted in the literature that terrorist organisations choose the method and location of their attack in order to achieve political or economic destabilization of the targeted government and to garner media attention for their cause. To carry out a single attack versus a simultaneous campaign is a decision for terrorists to consider, yet researchers have not examined these decisions closely. This article will examine why groups would carry out simultaneous campaigns over single attacks: what are the benefits?

In two of the largest terrorism datasets, *International Terrorism: Attributes of Terrorist Events* (ITERATE) [1] and the *Global Terrorism Database* (GTD) [2], attacks are coded as single events, even when they are carried out as part of a coordinated campaign.[3] Unfortunately, neither dataset specifically denotes whether or not attacks are coordinated. In order to complete any analysis, this project will first determine which attacks formed part of a coordinated campaign.

Since the most commonly used datasets disaggregate simultaneous attacks, the empirical literature on terrorism has a dearth of academic studies on this type of attack. Theoretical papers have examined the scale of terrorist attacks. Past research shows that the scale of a terrorist attack can help the targeted government to estimate the size of the organisation's resources.[4] Coordinated attacks are by definition of a larger scale. The terror attacks of

September 11, 2001 (a simultaneous attack with four component attacks), was of a scale not seen before.[5] Economic impact models of terror attacks have shown that simultaneous attacks can magnify the impact of a terror attack.[6] This article will differentiate between simultaneous attacks and single attacks using empirical analysis. In the past, empirical investigations of terrorism have largely ignored the presence of simultaneous attacks in the ITERATE and the GTD datasets. Not recognising that these attacks can be very different from single attacks may have biased the results of many past studies.

Potentially biased studies fall into two main categories: examining the level of terrorism or examining the impact of terrorism. In the former, terrorism is the dependent variable, while in the latter it is the independent variable. When a researcher is predicting the level of terrorism in a country/region/year given certain attributes, each attack, even if part of a coordinated effort, is coded separately. This coding is potentially problematic since attacks that are part of a coordinated effort are made under the same decision making process. For instance, terrorist organisations consider military expenditures when choosing a country to attack; that decision should only matter one time for a coordinated campaign. If all attacks are thought to be single attacks, then the terrorist organisation would be making that decision every time they carried out an attack. Therefore, the dependent variable would be systematically higher than the true value when coordinated attacks are present in the system. Such a measurement of the dependent variable is problematic, but only detrimental to the predictions of the past models if the measurement error is correlated with the independent variables, thus biasing the parameter estimates. It is highly likely that simultaneous attacks, the source of the measurement error, are correlated with some of the variables that factor into the resulting level of terrorism.

Potentially more problematic are the implications for studies assessing the impact of terrorism. For instance, there have been studies looking into the impact of terrorism on tourism [7], urban development [8], public opinion [9], and industry.[10] In these studies, terrorism is used as an independent variable to explain another phenomenon. Therefore, if any of the attacks coded are part of a coordinated effort, then that independent variable will be measured with error, i.e. the measure of terrorism will be overestimated. This counting system assumes that the individual attacks within a simultaneous effort have a one-to-one additive effect, which may not be true. For instance, if a coordinated attack consists of two attacks, then this counting system implies that each of the two attacks have the same impact as a different single attack. If an independent variable is measured with such an error then this can lead to biased estimates of the parameters. Therefore, the impact of terrorism that these empirical studies are obtaining may not be the true parameter estimates.

Given the potential for bias in results ignoring simultaneous attacks, it is worthwhile to explore how common this type of attack is in terrorism datasets. First, the theoretical arguments surrounding simultaneous campaigns and impact of attacks are discussed. Second, the data used in the analysis will be presented. Third, follows an examination of the

methodology and results from the empirical analysis. Finally, suggestions will be offered for future research and analysis on simultaneous attacks.

Theoretical Arguments

Which is better for the terrorist organisation, carrying out many individual attacks throughout the year or concentrating on one large simultaneous set of attacks? To make an assessment of this, we must start from the assumption that terrorist organisations are choosing their optimal number of attacks given their budget constraints and the role that attacks play in their main goals: destabilization, media attention, and recruiting new members.[11] Due to budget and training constraints, organisations must decide whether to apply their resources to single attacks spread out over time or devote time and energy to a smaller number of coordinated attacks.

Coordinated attacks are likely to kill more people than single attacks. First, since these attacks usually take place in two or more separate locations, there tends to be an increase in the total number of potential victims. Additionally, individuals with greater skills and capabilities are assigned to harder terrorist attacks and these individuals tend to be both more successful and kill more people on average.[12] Simultaneous attacks require more planning and coordination; everything else being equal, they are harder to execute than single attacks, thus individuals with more advanced abilities will be assigned to these tasks. As a result, coordinated attacks should cause more deaths than single attacks.

Similarly, coordinated attacks could be more successful than single attacks. There are two ways to calculate the success of simultaneous attacks. First, one can use the maximum success of all attacks within the campaign. Only one portion of the attack needs be successful in order to incite fear and create direct victims. Second, the average of the success of each attack within the coordinated effort can be used to accurately measure the effectiveness of the campaign. Simultaneous attacks should be more successful than single attacks for two reasons. If a single attack that is part of a coordinated effort is unsuccessful, the campaign can still be a success if one of the other parts of the effort is successful. Additionally, more able individuals are assigned to harder tasks [13]. Therefore, due to planning and coordination issues, more able individuals should be assigned to coordinated terrorist efforts, thus leading to more successful simultaneous attacks.

If simultaneous attacks tend to produce more fatalities and are more successful, these attacks should receive more media coverage. A single unsuccessful attack may not receive media attention, but a coordinated campaign with one unsuccessful component is likely to be reported. Additionally, the higher the number of casualties, the greater amount of media attention the attack is likely to receive.[14] Therefore, if coordinated attacks do generate more fatalities, then simultaneous attacks in developed countries are more likely to garner media attention than single attacks. This increased news coverage can have the effect of bringing the motives of the terrorist organisation to the forefront, thus satisfying one of their main goals. In

fact, the coordinated attacks on September 11th had a permanent effect of increasing the number of news stories on terrorism.[15]

Based on these reflections, two hypotheses concerning the impact of simultaneous attacks will be tested in the empirical section:

H1: Simultaneous campaigns tend to kill more people than single attacks.

H2: Simultaneous campaigns tend to have higher success rates than unsuccessful campaigns.

Data

Data for this project were derived from three main sources. Data on terrorist attacks come mostly from the University of Maryland's Global Terrorism Database (GTD). The GTD is a comprehensive dataset covering both domestic and transnational terrorist events from 1970 until 2007 and beyond to the present day. It is one of the very few datasets with a worldwide coverage that also contains information on domestic terror events. Therefore, by using the GTD, we are able to obtain a fuller picture of the total amount of terrorism occurring in the world.[16]

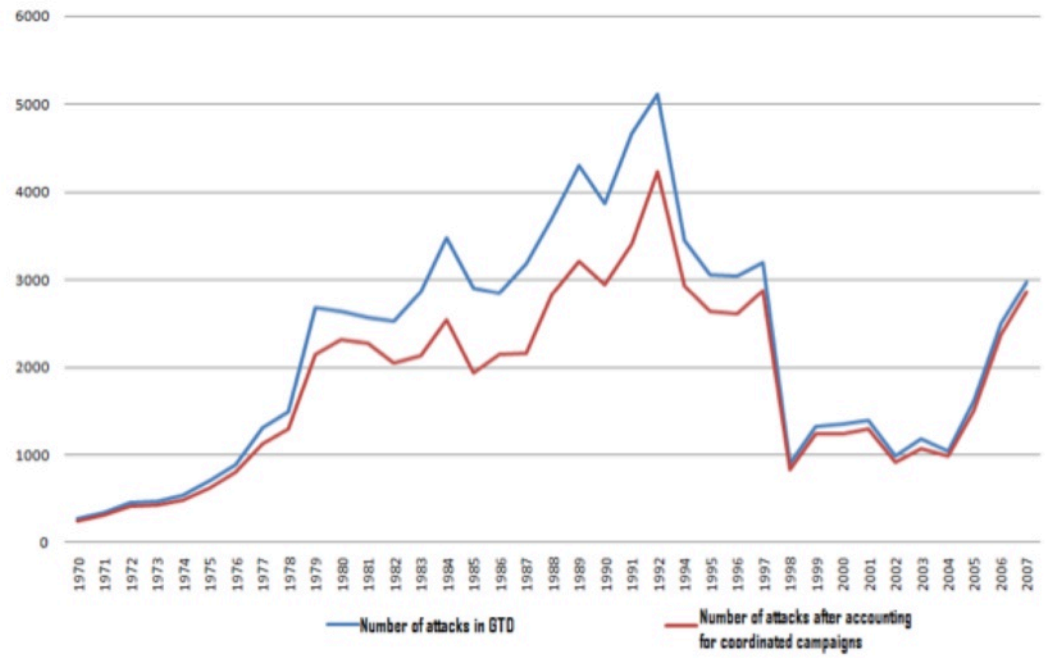
However, this dataset is not without its shortcomings. First, the information in the GTD was collected entirely from open sources. Therefore, bias could be introduced to the model if attacks are not reported in public sources. Attacks that are stopped in the planning stages and not reported to the media are also not included. Additionally, the GTD does not contain full data for the year 1993. Finally, the GTD uses an operationalised definition of success, resulting in over 90 percent of attacks being coded as successes.

The ITERATE dataset, which was developed by Edward Mickolus, contains more granular information on the success of terror attacks. In ITERATE, success is coded on a 0-6 scale, with information on attacks stopped in the planning stages, attacks executed unsuccessfully, and attacks carried out as intended. For instance, the four attacks comprising the events of September 11th, 2001 are all coded as successes in the GTD. However, ITERATE codes the attacks on the World Trade Center and the Pentagon as successes, but the crash of United Flight 93 is coded as an attack that was executed, but unsuccessfully. This information provides a much sharper picture of the difference in success between different attacks than the information in the GTD. Therefore, the analysis on the success of simultaneous attacks vis-à-vis single attacks will be carried out using ITERATE.[17]

Since neither dataset separately denotes when attacks are a part of a coordinated event, the available data was used to construct which attacks are most likely to constitute simultaneous attacks. Several different definitions of coordinated events were considered; however, in order to not overstate the effects of simultaneous attacks in this article, the strictest definition of simultaneous attacks was chosen. In order for two or more attacks to be considered part of a

simultaneous campaign, the attacks must be carried out on the same day, in the same country, by the same group, using the same method.

Figure I: Number of Terror Attacks per Year



Under this definition, approximately 25 percent of the attacks coded in the GTD are part of a simultaneous campaign. The breakdown of simultaneous campaigns by year can be seen in Figure 1. This definition probably understates the proportion of simultaneous campaigns in the dataset. By definition, if the group perpetrating the attack is unknown, the attack cannot be part of a simultaneous campaign. Approximately 38 percent of all attacks in the dataset were carried out by unknown perpetrators. Relaxing the definition of simultaneous attacks to only consider the day, location, and method of attack shows approximately 30 percent of all attacks listed in the GTD as being part of simultaneous campaigns. Additionally, groups can carry out coordinated attacks in different countries. For example, in 1998 local members of the Egyptian Islamic Jihad (affiliated with the global Al-Qaeda network) carried out coordinated truck bombs in Kenya and Tanzania. Since these attacks took place in separate countries, they will not be coded as simultaneous attacks. However, relaxing the definition of simultaneous attacks to only consider the day, method, and group, shows 26 percent of all attacks listed in the GTD are part of simultaneous campaigns. Using the strictest definition may exclude some attacks that are part of coordinated efforts, but it should minimise the number of single attacks which are incorrectly classified as part of a simultaneous campaign.

When utilising the information from ITERATE, the same technique is used to define simultaneous attacks – the attacks must have taken place on the same day, location, method, and group. Approximately 13 percent of the total attacks in the ITERATE dataset are part of a coordinated campaign. This number is lower than the corresponding calculations in the GTD

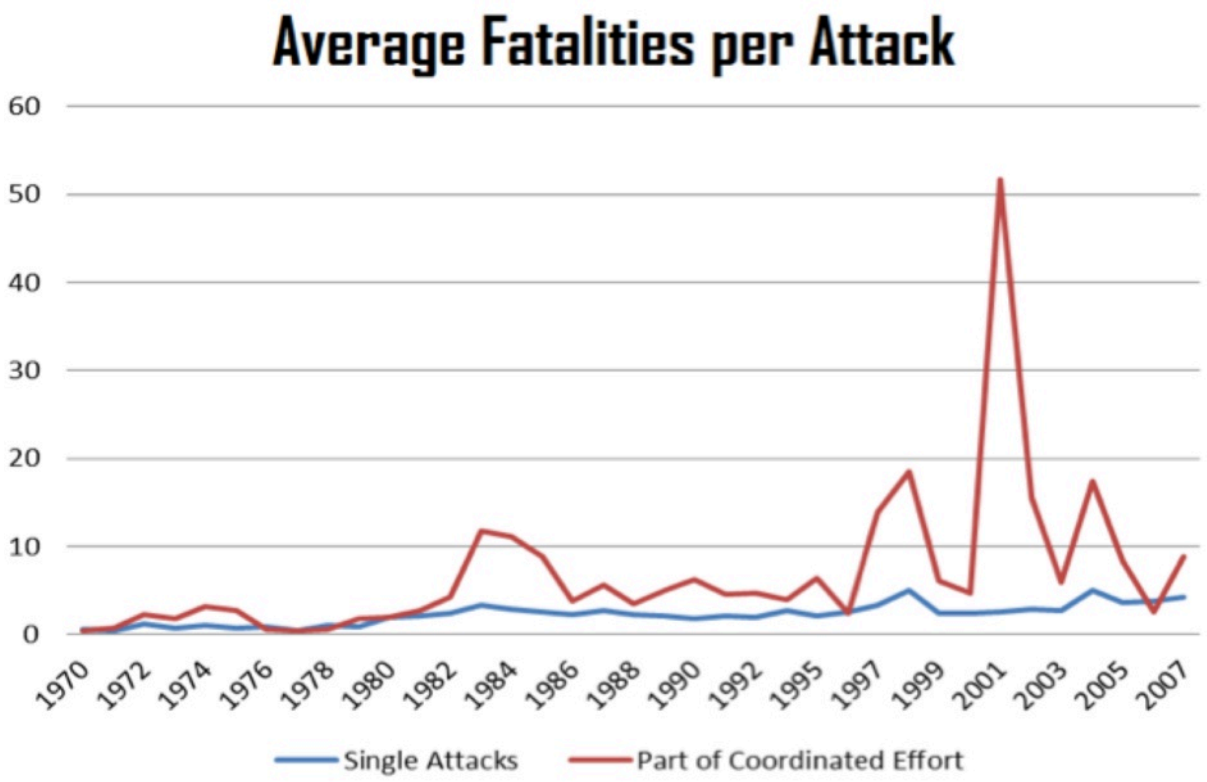
dataset. ITERATE only contains information on transnational terrorism, therefore suggesting that coordinated campaigns happen at higher rates in domestic attacks than in transnational attacks. However, this finding may be due to peculiarities of the data available. Transnational attacks can occur in many different countries, while domestic attacks must by definition take place in the same country where the group is located. Therefore, since the definition of a simultaneous attack in this article requires that the attacks occur in the same country, we may be undercounting the number of transnational simultaneous attacks. For this reason, the data from ITERATE will only be used when testing Hypothesis H2 – calculating the impact of simultaneous attacks on success or failure of attacks.

A third set of data is derived from the Big Allied and Dangerous (BAAD I) dataset.[18] This dataset codes information on terrorist group characteristics. The dataset contains a snapshot of each terrorist organisation at one point in time between 1998 and 2005. Information offering insight into group capability includes data on age, size, ideology, territorial holdings, and number of alliances. Information from BAAD will be used to control for the characteristics of terrorist organisations that may lead to more terror fatalities.

Results

First the number of fatalities will be examined. Since some terrorist organisations do not intend to kill individuals with their attacks, group characteristics from the BAAD dataset will be added to this analysis. Figure II shows the number of fatalities in single attacks and attacks that are part of a coordinated campaign. II.

Figure II



Since the early 1980s, attacks as part of a coordinated effort have led to more fatalities. In order to verify this relationship, other characteristics that also determine the number of fatalities must be added to a regression equation. When information from the BAAD dataset is used in the regression analysis, only attacks carried out by perpetrators in the BAAD dataset between 1998 and 2005 are included, which further restricts the sample. While this sub-sample is non-random, the groups in the BAAD dataset were not selected based on whether or not they carried out simultaneous attacks. Therefore, it is plausible that the sub-sample is random on the known characteristics, and especially our characteristic of interest – simultaneous attacks. In Figure II, the time period from 1998-2005 records a larger divergence in fatalities from single attacks versus coordinated campaigns than earlier time periods. This divergence may indicate that coordinated campaigns are different in this time period than earlier. However, in Figure I, this time period experienced fewer attacks that were part of a coordinated effort. These issues need to be remembered when generalisations are made.

In this regression, the number of people killed in each attack will be a function of whether or not the attack was simultaneous, whether or not there were regional effects, year effects, attack type effects, group ideology, number of allies, and whether or not the attack was a suicide attack. The number of people killed is censored at 0 – meaning that many attacks result in no fatalities, so a Tobit model will be employed. The Tobit model allows the econometrician to account for different types of 0's in the dependent variable.[19] In this case, the number of

people killed may be 0 because the attack was unsuccessful in killing anyone or because the group never had any intention of causing casualties.

The results from the Tobit estimation can be seen in Table I. The coefficient of simultaneous is positive and significant, implying that attacks that are a part of simultaneous campaigns tend to kill more people. On average, 45 percent more fatalities occur in simultaneous campaigns than in single attacks, all else being held constant. Note that while the number of people killed increases with simultaneous attacks, the increase is not one-to-one with the scale of the attack. By definition, a simultaneous attack must have at least two attacks as components. However, the number of people killed in a coordinated effort less than doubles. This finding lends credence to the issues raised earlier, namely that using counts to measure the impact of terror attacks could lead to biased results when single and simultaneous accounts are treated the same way.

Table I: Number of Individuals Killed by Terror Attack 1998-2005

Simultaneous	25.24*** (5.30)
Suicide Mission	52.70*** (5.91)
Leftist Only	2.77 (5.69)
Religion Only	10.17** (4.86)
Ethnic Only	-0.46 (13.07)
Large	39.70** (15.29)
Alliance	2.10*** (0.35)
Region FE	Yes
Time FE	Yes
Type FE	Yes
Constant	-100.74 (17.16)
Observations	2851

* Statistically significant at 10% level

** Statistically significant at 5% level

*** Statistically significant at 1 % level

Next, how simultaneous attacks impact the success of terrorist attacks was examined using the ITERATE dataset. Since information on group characteristics are not used to explain success, the regression is no longer restricted to only the years where BAAD data is available. The impact of simultaneity on success is weaker, as can be seen in Table II, but provides evidence that simultaneous attacks are more successful than single attacks.

Table II: Success of Terror Attacks 1968-2004

	Model 1 Ordered Logit - Max	Model 2 Tobit - Average	Model 3 Ordered Logit - Average
Simultaneous	1.088*** (0.161)	0.173 (0.209)	0.3822** (0.129)
Year Fixed Effects	Yes	Yes	Yes
Method Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes
Constant	NA	7.59 (1.10)	NA
Observations	10819	10819	10819

* Statistically significant at 10% level

** Statistically significant at 5% level

*** Statistically significant at 1 % level

Three specifications of the model were run. For each specification, attacks that are part of a coordinated effort are combined to count as a single attack and denoted as "simultaneous". Other variables in the regression that may characterize success include location of attack, method of attack, and year of attack.

Country and year fixed effects are included in this regression. The level of success by year varies from a low of 4.5 to a high of 5.8 on a six point scale. The average level of successful terror attacks in individual countries varies between 2.5 and 6.0 on a six point scale. Therefore, differences between different countries and years need to be taken into account in the regression model. One reason for these differences in success may be the level of deterrence by the targeted country; this should help determine success. Therefore, countries that spend more on deterrence should experience fewer successful attacks. The amount of money spent on deterrence depends on the country's determination of the risk they may face. Controlling for the year of attack will control for differences in deterrence by year. However, deterrence spending is not the only factor that determines success. Method of attack also plays a role. For instance, suicide attacks may be harder to deter than other methods. ITERATE codes the method of attack into twenty-five broad categories including assassination, bombing, hostage taking, hijacking, and armed assault, etc. The average success by type of attack varies from 2.5 to 5.9 on ITERATE's six point scale.

Three models, referring to three ways to operationalise success, are presented in Table 2. In Model 1, success of a coordinated campaign is assigned the value of its most successful component. In a coordinated campaign, only one component of the attack has to be successful in order for the public to view the attack as a success. Since the dependent variable is an ordinal variable between 0 and 6, an ordered logit estimation is run. In this model, simultaneous attacks are more successful than single attacks. Next, success of a coordinated

campaign is assigned the value of the average success of each of its components. This definition of success is the most intuitive in operational terms, but it is more difficult to address empirically. The success variable is still between 0 and 6, but for simultaneous campaigns the variable is not necessarily an integer. In Model 2, a Tobit estimation is run on the average success variable. Tobit was used since there are many censored variables at both the upper and lower limits of the success scale. The results of this estimation model show no relationship between simultaneous attacks and success. In Model 3, the average success of each terrorist campaign is still used, but this number is rounded to its nearest integer value, allowing an ordered logit regression. Model 3 reveals a positive relationship between simultaneous attacks and success. Examining the odds ratio for Model 1 and Model 3 reveals that a coordinated campaign increases the probability of success by between 46 and 172 percent.

Both hypotheses, H1 and H2, were supported by the empirical analysis – simultaneous campaigns generate more fatalities and are more successful. However, the number of fatalities increases by only 45 percent, while the number of attacks involved at least doubles. The impact of the simultaneous attack is greater than the impact of a single attack, but in a smaller proportion to the increase in size. If the goal of the terrorist group is maximizing the number of deaths on a specific day, then it would make sense to use simultaneous attacks. If the goal of the group is to maximize the total number of fatalities in a year, single attacks may be more worthwhile. Hypothesis H2 is also supported, though results depend on how success for coordinated campaigns is defined. A terrorist group that is interested in successfully carrying out their planned attacks may be more interested in using simultaneous campaigns. Given the support for H1 and H2, considering each part of the campaign individually, as has been done by the past literature, may not be appropriate.

Conclusions

Simultaneous attacks have been largely ignored by the empirical literature on terrorism. In this article, several specifications are considered to classify which events are a part of simultaneous campaigns. The strictest definition - same day, group, location, and type of attack - is used in all analyses to protect against incorrectly classifying attacks as simultaneous.

The goal of this article was to examine the impact of simultaneous attacks. The hypotheses stated that simultaneous attacks would be more successful and lethal. The empirical results suggest that simultaneous attacks have a higher probability of success. Additionally, simultaneous attacks generate more fatalities, but not on a "one-to-one" basis. This research has established that single attacks are different from attacks that are part of a coordinated effort, even though these two types of attacks are treated the same by the empirical quantitative literature. This difference should be considered in the future to ensure that results obtained from using terrorism counts are not biased. A closer look should also be given in future analyses with regard to the definition of "success". An attack, or a set of attacks, might

be "successful" in tactical terms but be a strategic failure. Beyond the "success" of individual or coordinated acts of terrorism, there is the issue of long-term effects. Terrorism as a mode of conflict waging has a poor record of achieving its ultimate objectives.[20]

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Notes

[1] Edward Mickolus, Todd Sandler, Jean Murdock, and Peter Flemming. *International Terrorism: Attributes of Terrorist Events Data Codebook*, July 2002.

[2] National Consortium for the Study of Terrorism and Responses to Terrorism (START). (2012). Global Terrorism Database [Data file]. Retrieved from http://www.start.umd.edu/gtd

[3] For instance, both datasets code the events of September 11th, 2001, as four separate attacks.

[4] Per Baltzer Overgaard (1994). "The Scale of Terrorist Attacks as a Signal of Resources." *The Journal of Conflict Resolution*. Vol. 38, No. 3, pp. 452-478.

[5] Hoffman, Bruce (2002). "Rethinking Terrorism and Counterterrorism Since 9/11." *Studies in Conflict & Terrorism*. Vol 25, Issue 5, pp 303-316.

[6] Gordon, Peter; Moore, James E. II; Richardson, Harry W.; and Pan, Qisheng, "The Economic Impact of a Terrorist Attack on the Twin Ports of Los Angeles- Long Beach" (2005). Non-published Research Reports. Paper 23. http://research.create.usc.edu/nonpublished_reports/23

[7] Walter Enders, Todd Sandler, and Gerald F. Parise (1992). An Econometric Analysis of the Impact of Terrorism on Tourism. *Kyklos* 45, pp. 531-554.

[8] Edward Glaeser and Jesse Shapiro (2002). "Cities and Warfare: The Impact of Terrorism on Urban Form." *Journal of Urban Economics*. Volume 51, Issue 2, pp. 205-224.

[9] Theodore Downes-Le Guin and Bruce Hoffman (1993). *The Impact of Terrorism on Public Opinion - 1988-1989*. Santa Monica, CA: RAND Corporation.

[10] Claude Berrebi and Esteban Klor (2005). "The Impact of Terrorism across Industries: An Empirical Study." C.E.P.R. Discussion Papers 5360.

[11] Frey, B.S. and S. Luechinger (2008). "Three Strategies to Deal with Terrorism." *Economic Papers* Vol. 27, No. 2, pp.107-114.

[12] Effi Benmelech and Claude Berrebi (2007) "Human Capital and the Productivity of Suicide Bombers." *Journal of Economic Perspectives*, Vol. 21, No. 3, pp. 223-238.

[13] Ibid.

[14] Dominic Rohner and Bruno S. Frey. (2007) "Blood and ink! The common-interest-game between terrorists and the media." *Public Choice*, Volume 133, pp. 129-145.

[15] Ibid.

[16] National Consortium for the Study of Terrorism and Responses to Terrorism (2012).

[17] Mickolus, et al. *International Terrorism.* July 2002.

[18] Victor H. Asal and R. Karl Rethemeyer. (2008). "The Nature of the Beast: Terrorist Organisational Characteristics and Organisational Lethality." *Journal of Politics,* Vol. 70, No. 2, pp. 437- 449.

[19] A zero inflated negative binomial was also run. The results are robust and available upon request.

[20] Cf. Alex P. Schmid and Rashmi Singh. Measuring Success and Failure in Terrorism and Counter-Terrorism: US Government Metrics of the Global War on Terror. In: Alex P. Schmid and Garry F. Hindle. After the War on Terror. Regional and Multilateral Perspectives on Counter-Terrorism Strategy. London: RUSI, 2009, pp. 33-61; Max Abrahms. The Political Effectiveness of Terrorism Revisited. *Comparative Political Studies,* Vol. 45, No. 3, pp. 266 -293.