

van Um, Eric; PISOIU, Daniela

Working Paper

Effective Counterterrorism: What Have We Learned so Far?

Economics of Security Working Paper, No. 55

Provided in Cooperation with:

German Institute for Economic Research (DIW Berlin)

Suggested Citation: van Um, Eric; PISOIU, Daniela (2011) : Effective Counterterrorism: What Have We Learned so Far?, Economics of Security Working Paper, No. 55, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin

This Version is available at:

<https://hdl.handle.net/10419/119381>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Eric van Um and Daniela Pisoiu

Effective counterterrorism: What have we learned so far?

September 2011

Economics of Security Working Paper 55

This publication is an output of EUSECON, a research project supported by the European Commission's Seventh Framework Programme.



Economics of Security Working Paper Series

Correct citation: Van Um, E. and PISOIU, D. (2011). "Effective counterterrorism: What have we learned so far?". Economics of Security Working Paper 55, Berlin: Economics of Security.

First published in 2011

© Eric van Um and Daniela PISOIU 2011
ISSN: 1868-0488

For further information, please contact:

Economics of Security, c/o Department of Development and Security, DIW Berlin – German Institute for Economic Research, Mohrenstr. 58, 10117 Berlin, Germany.

Tel: +49 (0)30 89 789-277

Email: eusecon@diw.de

Website: www.economics-of-security.eu

Effective counterterrorism: What have we learned so far?

(Eric van Um & Daniela PISOIU)¹

September, 2011

Abstract

The fight against terrorism, in particular of Islamist nature, has become a focus area of foreign and security policies in Western countries and around the world. This substantial effort is however only to a limited extent matched by adequate evaluations as to its actual success. This paper offers an overview of the counterterrorism effectiveness literature in terms of main areas of interest, conceptualisation and operationalisation difficulties as well as methodological considerations regarding the types of methods used, validity and reliability evaluations. It discusses the different understandings of causality and proposes a working definition of counterterrorism effectiveness. We find that a main focus of the literature lies on the impact component of effectiveness, often in the sense of a reduction of terrorist attacks in general or a reduction of certain methods of terrorism such as suicide attacks.

Our model article “What Happened to Suicide Bombings in Israel? Insights from a Terror Stock Model” by Kaplan et al. (2005) illustrates the above-mentioned issues and reflects the mainstream approach in this field. The article uses econometric methods to determine the impact-effectiveness of counter-terrorism and reflects the problematique associated with attempts to infer a causal relationship between counterterrorism policies and the occurrence of terrorism.

Keywords: Counterterrorism, effectiveness, causality, quantitative and qualitative research methods

1 Introduction

Confronting terrorism in the Western world has amounted to a substantial governmental effort, not least financial. Estimates suggest that the US alone has allocated between 2001 and 2011 more than 1 trillion US-dollars to measures and policies related to the fight against terrorism (Mueller and Stewart, 2011: 2).

In this context, an effectiveness assessment would appear not only warranted but also necessary. In an often cited meta-analysis, Lum et al. (2006) identified about 20.000 studies

¹ Institute for Peace Research and Security Policy at the University of Hamburg (IFSH), Beim Schlump 83, 20144 Hamburg, Germany. Corresponding author: Eric van Um. E-mail: vanum@ifsh.de.

on terrorism, out of which only seven contain information on the effectiveness of counterterrorism (CT) policies. Lum et al. concluded at the time that “[t]here has been a proliferation of anti-terrorism programs and policies as well as massive increases in expenditures toward combating terrorism. Yet, we currently know almost nothing about the effectiveness of any of these programs” (Lum et al., 2006: 510). Other authors have also accused the minor role counterterrorism effectiveness plays in academic research (Gold, 2005: 7; TTSRL, 2007: 28; van Dongen, 2009: 1; Benmelech, et al., 2010: 1).

On the other hand, the need to learn more on the effectiveness of these measures and on intended and unintended side-effects has been repeatedly formulated by scholars and politicians alike.² Recently, an increase in interest and research effort in the area could be observed as illustrated by a limited number of works dealing specifically with counterterrorism effectiveness,³ as well as a number of research projects that have been launched only recently on this issue.⁴ An interesting paper has been produced by van Dongen (2009)⁵, which details the shortcomings of current research on CT effectiveness. Our own paper has greatly benefited from his research, but goes beyond by engaging in an updated, comprehensive and critical overview of the literature on CT effectiveness and by offering a novel conceptualisation of the term. We also discuss methodological and measurement aspects, as well as the limitations of causality claims.

The paper first introduces a novel conceptualisation of effectiveness and a first assessment of the focus of research on CT effectiveness. Within this conceptual framework, it then proceeds to provide a critical overview of the methods and indicators used. The fourth part discusses the issue of establishing causality in CT effectiveness as one of the major challenges in this field. The case study provided at the end is meant as an illustration of the main trends, achievements and difficulties encountered in researching this topic.

² Cf. Tudge, 2004; Ganor, 2005; Keohane, 2005; Lum et al., 2006; Stohl, 2006; Spencer, 2006; Van Dongen, 2009.

³ Cf. Beasley, 2008; Enders and Sandler, 2009; Drakos and Giannakopoulos, 2009, TTSRL, 2008, Van Dongen, 2009; cf. Crenshaw, 2010, for instance.

⁴ Alex Schmid and Rashmi Sing started a research project at the University of Maryland: “Success and Failure in Terrorism and Counterterrorism: Development of Metrics on the Global War on Terror and the Global Jihad” (<http://www.start.umd.edu/start/research/projects/project.asp?id=60>). An ongoing research project on the “History of Counterterrorism 1945-2005” is conducted at the University of Utrecht, where the effectiveness of counterterrorism measures is analyzed (<http://www.counterterrorism.nl/>). The Australian Research Council (ARC) Centre of Excellence in Policing and Security (CEPS) is funding a regionally-focused project modelling the effectiveness of Anti- and Counter-terrorist Strategies in Indonesia, the Philippines and Thailand (<http://ceps.edu.au/?q=node/1015>).

⁵ The paper is titled “Break it Down: An Alternative Approach to Measuring Effectiveness in Counterterrorism” and has been published as EUSECON Working Paper, no. 23 in December 2009.

2 Conceptualising effectiveness

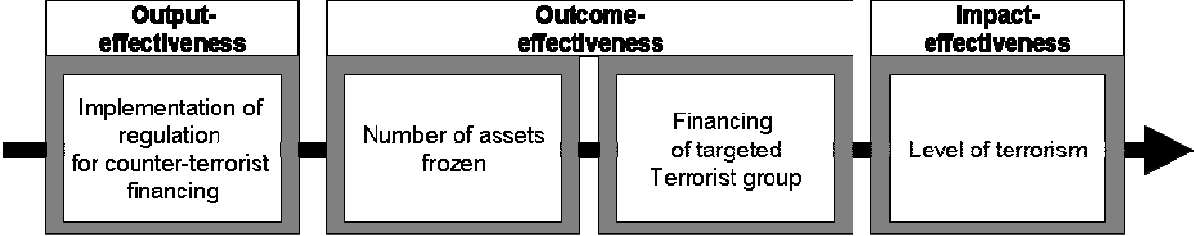
As already suggested in the introduction, CT programmes and measures have proliferated in recent years and there is also increasing awareness of the importance of assessing their effectiveness. Yet a generally accepted definition or framework of CT effectiveness does not exist in the literature to date (see van Dongen, 2009: 1). What can be found is either an assumed conceptual self-evidence or concrete indicators, in the context of a proliferation of stand-alone terms such as impact, success, consequence, etc. However, authors have a widely different understanding of the criteria by which certain policies and instruments can be considered effective. For the purpose of providing a clear and systematic assessment of the literature, we propose the effectiveness conceptualisation developed by Young (2001) in relation to regimes, in the form of output, outcome and impact effectiveness:

Output effectiveness would refer to the implementation of regulations, policy instruments or compliance mechanisms. For output effectiveness, it is the behaviour of officials alone (those passing the law and the agencies executing the law), in relation to which the effectiveness of the adopted measures is assessed. *Outcome effectiveness*, in contrast, would particularly cover the direct and measurable effect that these laws have in real life. Outcome effectiveness would basically depend on the behaviour of policy-makers implementing the measure in the first instance, but also on the behaviour of the targeted group in relation to the short-term objectives of a certain CT policy, such as affecting the finance or the recruitment pool of a terrorist organisation. The implemented measure might have the effect desired or not, also depending on whether the terrorist organisation or group is able to find ways around it. *Impact effectiveness* depends on the behaviour of the targeted audience alone in relation to the long-term objective of the CT policy, namely that of reducing or stopping terrorism. It is not the policy-makers or those executing a specific law any longer who determine the effectiveness of a policy, but the reaction of the target of such a policy, the one that in the end makes a certain policy a success or failure.

Consider the example of freezing terrorist assets to illustrate this concept: passing a bill which allows the freezing of assets suspected to serve terrorist financing purposes would be considered as evidence of *output effectiveness* only and does not inquire into whether these measures actually work or not; in other words, one would not look into the intended effects of these measures as prescribed by law. *Outcome effectiveness* is twofold and would firstly refer to the short-term objective of such a policy measure, namely freezing terrorist assets. The long-term objective of such a policy would aim at draining the resources of terrorist groups.

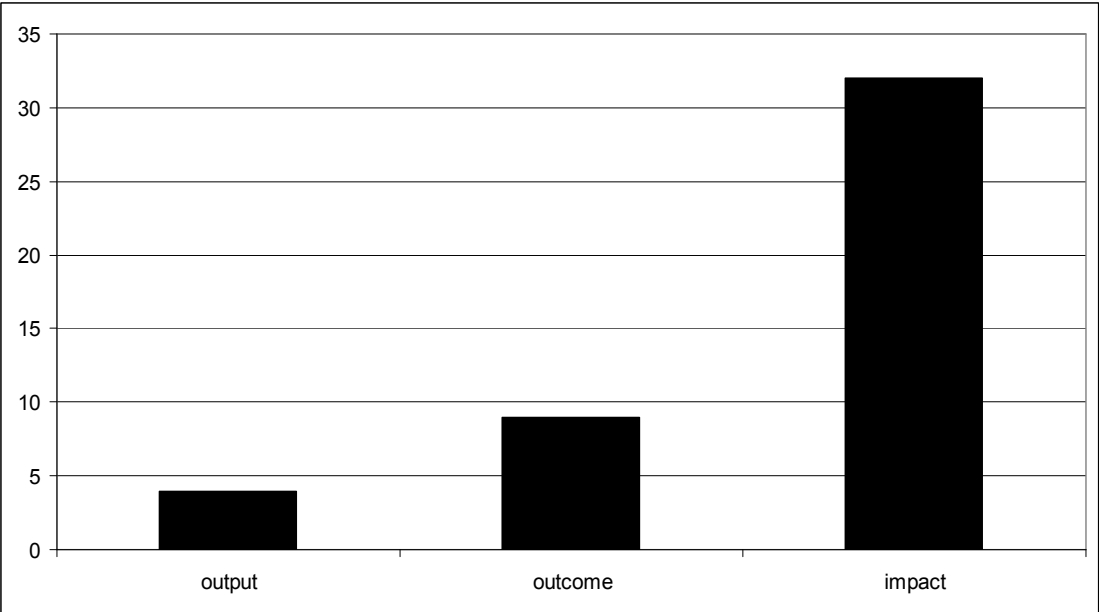
Impact effectiveness would correspond to the reduction or cessation of the terrorist, violent activity of the groups in view as a result of this policy. This example is illustrated in Figure 1.

Fig. 1. Concepts of CT effectiveness: The example of freezing terrorist assets



In order to offer a systematic overview of the CT effectiveness literature and also facilitate a critical assessment of methods, measurements and causality claims, we will structure the discussion in the following according to the proposed threefold conceptualisation. In quantitative terms, the main focus in the literature lies on the impact component of effectiveness, often in the sense of a reduction of terrorist attacks in general or a reduction of certain methods of terrorism (such as suicide attacks), while output- und outcome-effectiveness seem to have played only a minor role (see Figure 2).

Fig. 2 Number of studies identified on different dimensions of CT effectiveness



Source: The total number of studies evaluated for this article [38] distributed by main type of counterterrorism effectiveness according to our three-pronged conceptualisation. Some studies have been attributed to several categories. For detailed information on these studies see the Annex.

3 Methods used in research on counterterrorism effectiveness

A broad variety of methods have been put to use in the study of CT effectiveness, with a clear emphasis on quantitative methods and a focus on impact effectiveness. This is in a sense understandable, since the ultimate objective of most policies and measures is to have an effect on the level of terrorism and numbers usually offer clearer policy-relevant indicators.

For output effectiveness qualitative methods are commonly encountered, namely single and comparative case studies. Alexander (2006) describes CT measures in great detail in five selected countries and among others, evaluates the coherence of the implementation of legal CT policies as criterion for effectiveness; Monar (2007) looks at the extent to which the individual measures comprised in the action plan of the EU correspond to the threat assessment in the strategy and identifies shortcomings related to implementation, integration and legitimacy. In a similar approach, the TTSRL project (2008b) evaluates the extent to which counterradicalisation measures reflect the policy initiatives in the EU counterradicalisation strategy. For the latter, the findings are ambiguous, since, on the one hand, implementation appears to correspond to the policy objectives in view, yet are considered insufficient to address the radicalisation process. In this sense, the study goes beyond the intended purpose, since such an assessment reaches in the area of outcome.

Outcome effectiveness is usually dealt with together with impact effectiveness and research here often uses single or multiple case studies. Josiger (2006) discusses the effects of the implementation of CT policies by European governments (UK, Spain and France in particular), but also considers the reduction in terrorist activity. Byman (2006) looks in detail at the effects of targeted killings and takes several outcome indicators, such as the Palestinian public opinion support for peace negotiations, the Israeli public morale and support for the government, the number of killed terrorists and the disruption of terrorist organisations. Only a few studies focus on outcome effectiveness alone; Tsvetovat and Carley (2007) engage for instance in a simulation-based experiment focused on the recreation of scenarios of terrorist network evolution and assess the efficacy of software programs in terms of accuracy in the context of disrupting such networks. The TTSRL project (2008a) attempts, among others, to determine the effect of certain CT policies on radicalisation in a sample of European countries using, among others, expert interviews as a method. This study particularly makes an assessment on whether or not CT measures produced radicalisation as an unintended side-effect based on interviews with experts.

The overall largest category of CT effectiveness studies, those dealing with impact effectiveness, uses both quantitative and qualitative methodologies, whereby the majority are quantitative; they establish correlations between counterterrorism measures and expected effects in the sense of reducing or stopping terrorist activity altogether.⁶

A comparatively small body of literature has applied *descriptive statistics* often with a before-after comparison.⁷ Such a comparison contrasts a situation prior to a specific event to a consecutive one and tries to argue that variations may be attributed to the occurrence of this specific event. Hewitt (1984), for instance, analyses the effect of a number of CT measures (negotiations, reforms, etc.) for the case of five terrorist groups, mainly located in Europe with mostly simple correlations and before-and-after comparisons. Prunckun and Mohr (1997) discuss the effect of the April 1986 US air raid on Libya (Operation El Dorado). The level of activity of terrorist groups particularly linked to Libya, and the frequency of attacks against US targets – before and after the US military intervention – are taken as indicators to determine the effectiveness of this particular military intervention. Decreasing levels of terrorism after the US intervention are taken as evidence that the US policy may have been effective and acted as a deterrent. In a similar study, Collins (2004) addresses the effectiveness of US policies (military force, unilateral sanctions, and multilateral sanctions) to dissuade state support for terrorism, by using as indicator the frequency of Libyan-supported terrorist attacks before and after the US interventions had taken place. Similar to Prunckun and Mohr (1997), he finds that US military action apparently reduced the frequency of terrorist incidents in the aftermath of the intervention. He adds however, that, as a countervailing effect, the intensity of terrorist attacks did actually remarkably increase. Multilateral sanctions in contrast are found to have been more effective as Libya dismantled its terrorist support program as an apparent result.

A relatively larger number of studies have used regression analysis.⁸ Among the methods used here has been intervention analysis where the “intervention”-effect of a certain CT policy is evaluated. This method has been widely applied in order to determine the impact of a specific policy or incident on a time series. Much tribute has been paid to a study by Enders and Sandler (1993). The authors apply intervention analysis (to measure the impact of US interventions on the number of terrorist attacks) which is combined with a vector-

⁶ Cf. Hewitt, 1984; Landes, 1987; Enders and Sandler, 1993; Morag, 2005; Jonas and Harper, 2006; LaFree, 2006; Harcourt, 2006; Pratto et al., 2009.

⁷ Cf. Prunckun and Mohr, 1997; Collins 2004; Malvesti 2002; Perlinger, Pedahzur and Zalmanovitch 2005.

⁸ Cf. Enders, Sandler, 1993/2009; Pratto et al. 2009, Barros, 2003; Hafez and Hatfield, 2006; Dugan et al., 2009; Brophy-Baermann and Conybeare, 1994; Drakos and Giannakopoulos, 2009; Kaplan and Mintz, 2005; Beasley, 2008; Benmelech et al., 2010.

autoregression (to illustrate the interdependency of terrorists' options and to identify substitution and complementary effects) in order to determine the effectiveness of certain US CT policies. Intervention analysis is also used by other researchers to evaluate the effectiveness of certain CT measures.⁹

Cox hazard modelling is an alternative method that has often been used in this field. Cox hazard models are survival regression models used to model the estimated time before a certain event occurs based on a number of explanatory variables. Studies on counter-terrorism effectiveness have used this method to determine the likelihood/occurrence of future terrorist attacks as a function of CT measures.¹⁰

The most often encountered qualitative methods are, again, single and comparative case studies (Brown, 2007; Duyvesteyn 2008). For some of these studies, however, effectiveness is only considered as a side-aspect (Della Porta, 1992, Bonner 1992). Ashour (2008) engages in a comparative case study of group deradicalisation, where deradicalisation means ideological and behavioural abandonment of violence – dismantlement of the armed groups and abandonment of jurisprudence justifying violence and identifies three CT measures as independent variables: state repression, selective incentives and charismatic leadership that would together reduce the likelihood of groups re-engaging in terrorism. Another (widely neglected) qualitative method used in the study of *impact effectiveness* comes with interview methods. There is however hardly evidence that scholars are increasingly applying such methods to study CT effectiveness. Only one study has been identified which explicitly draws on interview techniques to identify the effect of counter-terrorism measures. Araj (2008) uses 88 interviews with senior leaders of Palestinian political organisations to evaluate the effect Israeli (repression) policies had on the number of suicide bombings.

4 Measuring Counterterrorism Effectiveness

Measurement is a fundamental aspect of effectiveness assessment, in particular given the large number of quantitative studies in the area, and one which is particularly problematic, given the difficulties to establish the reliability and validity of indicators. This is related to the

⁹ Cf. Barros, 2003; Hafez and Hatfield, 2006; Brophy-Baermann and Conybeare, 1994; Drakos and Giannakopoulos, 2009.

¹⁰ Studies that have used Cox hazard models include the ones by Dugan et al., 2009; Perkoski and Chenoweth, 2010 and Beasley, 2008.

often overlooked correspondence of measures – elaboration and implementation of legislation, disruption of terrorist activity - to the definition of the threat. As Ganor (2005: 102) argues: “In order to examine the effectiveness of the [...] action we must first define the goals underlying these initiatives, and decide whether these goals can be achieved using the methods and means chosen”. Clearly, such methods and means need to correspond to the characteristics of the phenomenon to be addressed: nature, manifestation, *modus operandi*, and not least causes. This is most relevant for the policy area of counterradicalisation, where understanding the conditions and drivers of radicalisation is essential for any attempt to combat it. TTSRL (2008b) assesses the EU counterradicalisation strategy based on a complex model of radicalisation factors, which are then compared with legal provisions and implementation in the UK and the Netherlands. Several authors point out the relevance of the nature of the threat (Ullman 2006; Simon) and the characteristics of the terrorist organisation in view (Malvesti, 2002).

A related aspect that influences the validity and reliability of indicators would be the comprehensive and systematic consideration of CT measures. While the range of such measures is quite large – targeted killings, air strikes, economic sanctions, fortification and socioeconomic reforms, etc., most studies deal with individual measures only or with a convenient selection thereof. Some of the individual measures examined are for instance: legislation criminalising acts as terrorism and the increase in law enforcement powers (Omotola, 2008); assassinations (Zussman and Zussman, 2006), racial profiling (Harcourt, 2006), or data mining (Jonas and Harper, 2006). In terms of convenient selection, examples are defensive barriers, roving patrols, security barriers, assassination of terrorist leaders, infiltration of terrorist organisations, closing off of channels of funding (Morag, 2005); hostile actions, strikes/killings or terrorists, arrest, detaining or questioning, release of terrorist operatives, entering enemy territory, confiscation of goods/funds, foiling terrorist attacks, sweeps/searches (Pratto, 2009: 4, 6-7). Hewitt (1984) offers a classification attempt, yet along largely unclear criteria; he looks at ceasefire and negotiations, economic conditions, making reforms, emergency powers and anti-terrorist legislation, the use of security forces. Finally, in some cases counterterrorism measures are not named in concrete terms but taken as a whole in cost-benefit assessments (Zycher, 2003; Stewart and Mueller, 2009).

The above mentioned difficulties primarily apply to outcome and impact effectiveness. Indicators for output-effectiveness are usually unproblematic as they simply refer to the establishment of authorities (Alexander, 2006), the production of strategies, legislation and organisation reform in the counterterrorism field (9/11 Commission report, 2006), or the

implementation of legislation, such as that of EU Counterterrorism directives in the Member States of the European Union (Keohane, 2005).

Outcome-effectiveness has been approached in the literature through the intermediary of a variety of indicators. The main problems here are the lack of systematisation, convenience selection and a certain vagueness as to whether certain elements should be considered as indicators or side-effects. An obvious way to systematise indicators would be by root causes of terrorism and operational ability of the targeted organisation: the latter might include capabilities (resources), recruitment, public support (here ideology and hearts and minds) national (constituency) and international. Yet, most studies classify in the second category, and usually take only one or some (operational) aspects under consideration.

An example of single operational aspects taken under consideration is Della Porta (1992), who finds that “the number of terrorist [...] arrests [can be taken] as an indicator of state success” and hence its effectiveness. Morag (2005) uses seven parameters in the categories ‘human life’, ‘economic resources’, ‘political resources’. Byman (2003) refers to the level of domestic support for counterterrorist operations, terrorist recruitment, operational freedom and the disruption of the adversary’s command and control structure. Perl (2005) focuses on the elements of terrorist infrastructure and terrorist capabilities. Spencer (2006) suggests that counter-terrorism measures may be considered effective if they help to reduce the popular fear of terrorism. Farley (2003: 407) finds that terrorist groups may be fought by breaking chains of command, “that is [...] every possible line of communication between leaders and foot soldiers”. A study that uses a more comprehensive set of indicators is provided by Malvesti (2002) who argues that one needs to focus on the ‘critical nodes’ in a terrorist infrastructure: financial networks, weapons, documents, political base, communication channels, intelligence network, sanctuary, cells and leadership.

In sum, scholars have used a variety of indicators to study outcome-effectiveness; and as a consequence, have come to very different views on how effective counter-terrorism policies are.

The issue of select indicators (human rights, popular support, economic consequences) being considered on occasion as indicators or side-effects is illustrated in Table 1 below. An assessment of what constitutes an effective CT policy may thus differ significantly depending on whether certain indicators are weighted more intensively or not. For example, if negative economic consequences of CT measures are only considered as a side-aspect in determining effectiveness, harsh measures which help to arrest potential terrorists but pose a heavy economic burden still might be considered effective. If, in contrast, the economic impact of

CT measures is more centrally considered at and significantly flows in the evaluation of effectiveness, the same measures might be evaluated more critically.

Table 1 Use of indicators within the study of the effectiveness of CT-policies

| | As a primary indicator | As a side-effect |
|------------------------------------|--|--|
| Civil rights / human rights | Josiger, 2006; Guiora, 2008; Harcourt, 2006. | Hewitt, 1984; Jonas and Harper, 2006; Eisele, 2006; Omotola, 2006; Perl, 2007. |
| Civilian casualties | Guiora, 2008. | Morag, 2005; Beasley, 2008. |
| Domestic support | Byman, 2003; van Dongen, 2009. | Morag, 2005. |
| (negative) Economic impact | Zussman and Zussman, 2006. | Brück, 2008; Walkenhorst and Dihel, 2002; Frey, Lüchinger et al. 2004. |

An interesting analytical question is posed by the issue of the respect for human rights in the fight against terrorism. Some authors approach its breach as a negative consequence or side-effect of counterterrorism policy (Malinovski, 2008). If, however, the respect for human rights can be linked to the idea of public support and therefore legitimacy of the government engaging in counterterrorism, one could in fact extend the element of public support as applicable not only to the terrorist organisation and its constituency, but also to that of the state government, thus influencing the overall impact. One would speak in this sense of a ‘balance of legitimacy’ which may help a state to raise public support through a well-designed counter-terrorism policy. State policies may however also boost the human capital of the terrorist organisation and sabotage state efforts to combat it in case the former has lost legitimacy through the breach of one of its most important functions – upholding the rule of law. Brown (2007) argues, for instance, that reinforced police actions have the opposite outcome to the one desired: public hostility towards the police and support for the terrorists or at least less of a willingness to cooperate with the authorities. Mertus and Sajjad (2008) similarly note that human rights abuses determine the de-legitimisation of the agent fighting terrorism. Duyvesteyn (2008) warns against the use of military force as a case of the government being provoked into overreacting, which confirms the discourse of the terrorist organisation. In a study on Israeli CT policies, Pedahzur and Perliger (2010) claim that these policies increasingly limit basic civil and political rights and even more lead to an increase in Palestinian animosity toward Israel.

Impact-effectiveness is measured by indicators related to terrorist activity: number of attacks, recidivism rates for deradicalisation programmes of individuals (Boucek, 2008; Noricks, 2009) and the degree of abandonment of violence in the case of group deradicalisation (Ashour, 2008). Horgan and Braddock (2010: 283) propose a more elaborated

model of assessment, the *Multi Attribute Utility Technology*, with two sets of indicators: the rate of terrorism, and subordinated domestic terror rates and recidivism; and second the domestic esteem of the government: boosted morale and political capital. A major issue within this category of effectiveness is the limited amount and reliability of data, for instance the accurate tracking and reporting of re-arrests in the case of recidivism (Noricks, 2009). In the case of the Saudi deradicalisation programme, for instance, Boucek (2008) notes that the individuals going through the programme were in fact minor offenders, which weakens to a great degree the accuracy of its declared success. Finally, a large number of studies use, instead of impact, outcome indicators such as the number of the killed and arrested terrorists and the destruction of the terrorist infrastructure.¹¹ The frequent use of the number of killed or arrested terrorists as an indicator is particularly problematic; since these individuals can easily be replaced, their number does not necessarily say much about the entirety and the size of a terrorist organisation and therefore about the effect on terrorist groups and the number of future attacks.¹²

Some of the issues addressed above can be traced to the challenge of gathering and using reliable and comprehensive data, especially relevant for quantitative studies. The field has generally and for a long time been plagued by a considerable lack of reliable data both on terrorism and counter-terrorism policies (Drakos, 2009; Benmelech, et al., 2010). There are currently only a few comprehensive databases of terrorist incidents, among which the “International Terrorism: Attributes of Terrorist Events” (ITERATE) and the Global Terrorism Database (GTD). These datasets have come under criticism, however, in terms of completeness and varying definitions of terrorist incidents. National datasets, in particular for the case of Israel seem to be more reliable. To overcome these difficulties of insufficient or unreliable data, researchers have regularly tried to supplement and combine existing datasets. Hafez and Hatfield (2006) for instance, collect incidents published in prominent media which is complemented by data from the Israeli based International Policy Institute for Counter-Terrorism (ICT).

As a final note to this section, we need to mention that there are a minority of studies which, while making claims of effectiveness analysis, do not actually provide any indicators for its measurement. Laffiteau (2009: 12-13) argues for instance that “[m]any of the initial steps taken by the US in the wake of the 9/11 al Qaeda terrorist attacks were appropriate, albeit expensive, counter-terrorism measures [...]. Multilateral efforts to identify and freeze al Qaeda’s and other terrorist groups’ financial resources was yet another step in the right

¹¹ Compare for instance, Guiora, 2008, Schmid and Sing, 2008, Floros and Newsome, 2009.

¹² See Byman, 2003: 1; Probst, 2005: 320; Spencer, 2006: 186; Stohl, 2006: 12 on this issue.

direction“. Yet he offers no basic criteria by which such statements could be assessed. Or, Alexander (2006: 211) argues that counterterrorism measures in Germany have been mostly effective, but that at the same time “[f]or example, the preemptive “grid search” capabilities have, thus far, proven ineffective,“ without explaining why this is the case.

5 Causality in CT effectiveness

There are various understandings of causality in the CT effectiveness literature, depending on the methodological approach and methods used. Whereas in qualitative studies causality is often assumed but not discussed, quantitative studies take a more differentiated view. Studies using analytical statistics, if at all, tend to cautiously suggest that correlative patterns of relations, identified in their study, may say something about a causal link. Some of the studies using descriptive statistics similarly make clear that correlative patterns or changes based on a before-after-comparison do not at all make it necessary to speak of a causal relationship (cf. Prunckun and Mohr, 1997). In other studies, claims of causality *are* made as for the study of Collins (2004) who tries to link the effect of sanctions to Libyan behavior. Similarly, Frisch (2005) claims to determine the impact of Israeli CT measures through indicators such as Israeli casualties through terrorist attacks, the number of Palestinian terror attacks etc. before and after those CT measures were implemented. Hewitt (1984) makes causal claims of CT measures such as anti-terrorist legislation through simple correlation and before-and-after comparisons of the level of terrorism. Such causal chains are, however, not always convincing particularly if we keep in mind the so called attribution problem.

The attribution problem refers to the question whether effects are the result of policy measures or of some other exogenous factors (cf. Byman, 2003; Probst, 2005; Stohl, 2006; Spencer, 2006; Perl, 2007; Van Dongen, 2009). In practice this means identifying and measuring the impact of control variables (Miller, 2007: 337). For output effectiveness this translates into the question whether legislation is the result of policy statements and strategies or of other factors, such as organisational interests for instance. Analysing outcome and impact effectiveness would imply considering a series of control variables, such as other measures, geographical, economic, political and cultural conditions. Ullman (2006: 30) lists a series of such conditions: organisational factors, strategic paradigm shift, and alliance politics. Attribution is especially problematic in the case of impact effectiveness. A critique often brought to process tracing, expert analyses and econometric approaches is the fact that effects

remain probabilistic, since the real cause for an observed effect may be a number of other factors and not necessarily the actual counterterrorism measure (Van Dongen, 2009: 8). In other words, the question is whether through the various measures the terrorist organisation changes behaviour in the sense of not engaging in attacks anymore or adapts and finds other ways and means to continue its activity in spite of the disruption. For instance, a reduction in the number of terror attacks could be traced to the terror groups' strategic thinking, such as the reallocation of resources for the preparation of a more elaborated attack, or to internal rivalry within terror groups.¹³ Enders and Sandler (1993) give the example of the measure of protecting embassies correlated with reduced attacks on them, which just reflects a switch in the operational focus, i.e. targeting other objectives. Targeted killings may interfere with the operational abilities of terrorist groups and in this way reduce the number of terrorist attacks. However, assassinating members of terrorist groups may also trigger revenge and ultimately increase the level of terrorism. Both are possible and cannot be derived from theoretical assumptions. Instead, as Jaeger and Paserman conclude, [a]ll of these factors suggest that whether targeted killings and suicide attacks raise or lower the level of violence is ultimately an empirical question (Jaeger and Paserman, 2007: 6). This points out a central problem underlying efforts to establish causality. The effectiveness of CT is largely an empirical question and therefore hardly one that can be dealt with from a theoretical standpoint. This is because both intended and unintended consequences of certain CT measures can only be derived to a certain extent from a theoretical framework and only if we operate on certain (for instance rational) premises.

Several solutions have been offered to the attribution problem, yet all of them not satisfactory, so that we can at the moment only speak in plausibility terms, when referring to the effect of various measures. Van Dongen introduces the concept of program theory, which largely resembles the method of process tracing. By breaking up a counter-terrorism measure and its assessment of effectiveness into certain components and theoretically establishing likely causal links between cause and effect of these components, van Dongen hopes to at least partially solve the attribution problem and to determine the effectiveness of such a measure. In general, the idea of establishing the causal chain of cause and effects of certain aspects of a counter-terrorism measure seems promising, since effects can more convincingly be accounted for. However, as van Dongen himself admits, establishing such a causal chain would be complicated considering the multi-level effects of a counter-terrorism policy, and

¹³ Cf. Bonner, 1992: 200; Spencer, 2006: 185; Perl, 2007: 1; Miller, 2007: 337.

additionally is bound to subjectivity, since there is no generally accepted standard for linking components of CT measures.

Another possible solution to this attribution problem would be the use of counterfactuals. The only such study available to date that uses a counterfactual is one produced by Enders, Sandler und Arce (2009), in which the effectiveness of the INTERPOL is assessed through a counterfactual. The authors use as proxy the number of arrests in the EU executed with the help of the INTERPOL. As observed by the authors: “The most challenging calculation for this study is to compute INTERPOL’s counterterrorism benefits, since it involves a counterfactual: i.e., how many more transnational terrorist incidents and associated casualties would there have been had INTERPOL coordinating actions not taken place. This is challenging because this counterfactual is obviously not observable”.

The use of counterfactuals is difficult to conduct and usually makes necessary the comparison with a counterfactual outcome that has not been shaped by counter-terrorism measures. „Truly to abnegate the null hypothesis you would need to set up two worlds, one in which nothing was done about terrorism and one in which "war" was declared, and see which version suffered more” (Tudge, 2004: 2).¹⁴

Since counterfactuals are difficult and often not even possible to conduct, an alternative approach would be to increase the effort of identifying control variables such as political and cultural specificities. Byman (2006) raises the issue of the relativity to political culture and geopolitics. In other words, one and the same measure might work in one country but not in another, such as in the case of Israel and the United States. For the latter, considerations such as the location of the enemy and its connection to states, as well as the impact on the international status as “upholder of the rule of law” (p. 106) would make targeted killings a less useful solution or at least one which is more difficult to legitimise. Methods to identify such variables would be interviews and surveys, for instance. This of course would not solve the attribution problem completely, as there would always be the possibility of certain circumstances not yet having been considered. The claim to causality would therefore also be in the area of plausibility. This type of approach would however significantly increase our understanding and especially provide a richer list of tested means of action for policy makers.

¹⁴ Similar views can be found in Spencer (2006): “[I]t is difficult to confirm the absence of an [occurrence and assign causality to that absence” and Gold (2005) “It may, of course, be hard to evaluate effectiveness, since it is difficult to measure the number and size of terrorist operations that are *not* undertaken because of effective deterrence”.

6 Illustrative study

In the academic literature, the effectiveness of Israeli counter-terrorism measures and of targeted killings in particular has been extensively studied. One of these studies was produced by Kaplan et al. (2005): *What Happened to Suicide Bombings in Israel? Insights from a Terror Stock Model*.¹⁵

This article allows us to illustrate many of the problems surrounding the issue of assessing the effectiveness of counter-terrorism policies. A particular focus is on the attribution problem and possible ways to solve it. Additionally, this paper is thematically in line with much of the literature; concerning both the types of methods used and the choice of the case study.

In their paper, the authors attempt to determine the effect of Israeli CT measures on the number of Palestinian suicide bombings which, in line with most quantitative work clearly reflects an interest in impact-effectiveness. The data on Israeli CT measures and Palestinian suicide bombings used covers a comparatively short period of time (2001 – 2003). The authors particularly rely on data from B'tselem, the Israeli Information Center for Human Rights in the Occupied Territories, which has collected extensive data on the conflict, on terrorist incidents and related casualties in particular. Unlike studies that exclusively rely on the major datasets on terrorism, this is based on national data which is likely to be more comprehensive and accurate. The findings indicate that preventive arrests rather than targeted killings seem to be more effective in reducing suicide bombings.

Similar to many quantitatively based studies on CT effectiveness, the authors start with a theoretical concept from which they derive plausible correlative relationships. Kaplan et al. (2005) suggest that the patterns of suicide attacks in Israel are directly linked to Israeli CT measures insofar as they affect the killing of suspected terrorists and recruitment of new terrorists. This is conceptualised in what they call the “terror stock model”, with the “stock” of terror comprising (particularly) the number of recruits available for the terrorist group. The model directly links the number of suicide bombings to the (supposed) number of terrorists available to plan and execute such violent attacks. In other words; if groups are likely to have a high inflow of recruits willing to blow themselves up, increasing levels of suicide terrorism are to be expected. While such argumentation may help to estimate the size and capabilities of terrorist groups, it may be criticised for its simplification. Obviously, the size of terrorist

¹⁵ Published in *Studies in Conflict & Terrorism*, 28:225–235, 2005.

groups does not always directly relate to their use of violence, since groups might not always use all resources available, something that the model presumes however.

The paper suggests that Israeli CT measures have an ambivalent effect on the terror stock and therefore do not necessarily reduce the pattern of suicide bombings. On the one hand, the killing of (alleged) terrorists and other measures such as preventive arrests is likely to diminish the resources and may also lead to fewer incidents of suicide bombings. On the other hand, the killing of Palestinian militants and uninvolved civilian is likely to increase opposition to Israeli politics and to increase the number of those committed to the fight against Israel which would then increase the pool of terrorist recruits. The attribution problem can be clearly be observed here – the fact that other factors which may have an impact on the number of suicide attacks (such as internal rivalry) are not extensively studied or accounted for.

Since suicide bombings are a (comparatively) rare event, their occurrence is modelled as a Poisson distribution. The non-linear relationship between CT measures and suicide bombings is then estimated based on various recruitment rates (independent of Israeli CT measures/dependent on targeted assassinations). The findings of the regression analysis indicate that the policy of targeted assassinations does not seem to have reduced the number of suicide bombings, as opposed to the policy of arresting terror suspects. Interestingly, the authors discuss the problematique of establishing causality from these correlative patterns.

“Although the analysis thus far has established a strong, positive statistical association between targeted hits and suicide bombing attempts via terror stock recruitment, is it plausible to treat this association as causal? Suppose that in a given month, terrorists select four different days on which to attempt suicide bombings in Israeli cities, but that Israeli intelligence agents obtain precise information regarding these plans. Suppose further that upon learning of these plans, Israeli authorities order targeted hits to prevent the bombings, but that only two hits are successful in doing so. At the end of the month, data would report that there were hits on four days, that there were suicide bombings following two of these hits, and that there were no suicide bombings on any other days. A statistical analysis of these data would suggest that hits were positively associated with suicide bombings, even though hits actually cut the number of suicide bombings in half.”

To rule out the possibility of a misleading correlation, the authors use more differentiated data on successful targeted assassinations (which killed those targeted) and non-successful hits (when the target was not hit). The argument made here is that “[i]f the positive association between suicide bombing attempts and (via recruiting) targeted hits estimated in this analysis is an artifact of the timing of hits intended to disrupt bombings, this effect should

be much stronger for botched hits that failed to kill those targeted than for on-target hits, and thus detectable in the data.” In other words, if the (timing of the) execution of suicide bombings was chosen prior to any CT measures and thus did not depend upon CT behaviour, simple logic suggests that we would then experience a stronger (positive) relationship between botched hits and the number of suicide bombings when compared to successful hits and suicide bombings. In contrast to that, if patterns of suicide bombings are (at least partially) determined by CT measures, we would not experience different correlations here. Results actually indicate that a differential effect of successful vs. non-successful targeted assassinations does not exist, which supports the idea that targeted killings actually increase the number of suicide attacks.

Similar to many studies that use quantitative methods, the authors are reluctant to say something about a clearly established path of causality. They rather make clear that the statistical relations uncovered are not definitive.

7 Conclusion

While effectiveness could be regarded as one of the most, if not the most important aspect in counterterrorism policy, not just academically but also politically, its study is plagued by both theoretical underdevelopment and a lack of methodological grounding. This contribution has attempted to provide a workable conceptualisation and operationalisation of counterterrorism effectiveness in the form of output, outcome and impact effectiveness and map out the various methodological approaches used in the literature. Thematically, there is a broad variety of measures taken under consideration and in various classifications, from comprehensive strategies to groups of measures and individual ones, such as targeted killings. Quantitative methods are overrepresented in the literature, while methods such as interviews or survey have not been exploited to their actual potential, in particular for the purposes of identifying control variables. The ever increasing methodological complexity corresponds to little progress in terms of findings, with a few exceptions such as the model study presented. We offered an overview of the types of indicators used to assess effectiveness and identified a series of validity and reliability problems, which can be one of the reasons for partly divergent results obtained. Also an important aspect to mention here is that of data availability and quality, as well as the ever enduring issue of lack of empirical data, common to most areas of terrorism research. Finally, we addressed the concept of causality as understood in the various

methodological approaches and concluded on plausibility as a more adequate conceptualisation. The attribution problem has also been identified as an unresolved issue, which in turn can be traced to the insufficient exploration of concurrent and competing factors apart from the CT as such. As a direction for future research, we pointed out the lack of qualitative empirical research to identify conditions to be operationalised in control variables, which would help diminish the attribution problem at the core of causality assessments.

References

- 9/11-Commission. (2006). *9/11 Five Years Later: Successes and Challenges*.
- Alexander, Y. (ed.) (2006). *Counterterrorism Strategies. Successes and Failures of Six Nations*. Potomac Books, Dulles, Virginia.
- Araj, B. (2008). Harsh State Repression as a Cause of Suicide Bombing: The Case of the Palestinian-Israeli Conflict. *Studies in Conflict & Terrorism*, 31(4), 284–303.
- Ashour, O. (2008). Islamist De-Radicalization in Algeria: Successes and Failures. *The Middle Eastern Institute Policy Brief*, 21, 1–10.
- Barros, C.P. (2003). An Intervention Analysis of Terrorism: The Spanish ETA Case. *Defence and Peace Economics*, 14(6), 401–412.
- Beasley, M. (2008). The Impact of Counterterrorism and Strain on Palestinian Terrorism. Contributions to Conflict Management. *Peace Economics and Development*, vol. 7, 331–348.
- Benmelech, E. & Berrebi, C. & Klor, E. (2010). Counter-Suicide-Terrorism: Evidence from House Demolitions. *NBER Working Paper*, No. 16493, October 2010.
- Bianchi, A. (2007). Assessing the Effectiveness of the UN Security Council's Anti-terrorism Measures: The Quest for Legitimacy and Cohesion. *The European Journal of International Law*, 17(5), 881–919.
- Bonner, D. (1992). United Kingdom: The United Kingdom Response to Terrorism. *Terrorism and Political Violence*, 4(4), 171–205.
- Boucek, C. (2008). Saudi Arabia's "Soft" Counterterrorism Strategy: Prevention, Rehabilitation and Aftercare. *Carnegie Papers*, 1–25.
- Brophy-Baermann, B. & Conybeare J.C. (1994). Retaliating Against Terrorism: Rational Expectations and the Optimality of Rules versus Discretion. *American Journal of Political Science*, 38(1), 196–210.
- Brown, B. (2007). Community Policing in Post-September 11 America: A Comment on the Concept of Community-Oriented Counterterrorism. *Police Practice and Research*, 8(3), 239–251.
- Brück, T. et al. (2008). A Survey on the Economics of Security. *Politikberatung kompakt*, 41. DIW Berlin, Berlin.
- Bures, O. (2010). EU's Fight Against Terrorist Finances: Internal Shortcomings and Unsuitable External Models. *Terrorism and Political Violence*, 22(3), 418–437.
- Byman, D. (2003a). Scoring the War on Terrorism. *The National Interest*, Summer 2003.
- Byman, D. (2003b). Measuring the War on Terrorism: A First Appraisal. *Current History*, 102(668), 411–416.
- Collins, S.D. (2004). Dissuading State Support of Terrorism: Strikes or Sanctions? (An Analysis of Dissuasion Measures Employed Against Libya). *Studies in Conflict & Terrorism*, 27(1), 1–18.
- Della Porta, D. (1992). Institutional Responses to Terrorism. The Italian Case. *Terrorism and Political Violence*, 4(4), 151–170.
- Drakos, K. and Giannakopoulos, N. (2009). An econometric analysis of counterterrorism effectiveness: the impact on life and property losses. *Public Choice*, 139(1), 135–151.
- Dugan, L., LaFree, G. & Korte, R. (2009). The Impact of British Counterterrorist Strategies on Political Violence in Northern Ireland: Comparing Deterrence and Backlash Models. *Criminology*, 47(1), 501–530.
- Duyvesteyn, I. (2008). Great expectations: the use of armed force to combat terrorism. *Small Wars and Insurgencies*, 19(3), 328–351.
- Enders, W. & Sandler, T. (1993). The Effectiveness of Antiterrorism Policies: A Vector-Autoregression-Intervention Analysis. *The American Political Science Review*, 87(4), 829–844.

- Farley, J.D. (2003). Breaking Al Qaeda Cells: A Mathematical Analysis of Counterterrorism Operations (A Guide for Risk Assessment and Decision Making). *Studies in Conflict & Terrorism*, 26(6), 399–411.
- Finn, J.E. (2010). Counterterrorism Regimes and the Rule of Law: The Effects of Emergency Legislation on Separation of Powers, Civil Liberties, and other Fundamental Constitutional Norms. In *The Consequences of Counterterrorism*, edited by M. Crenshaw. New York: Russell Sage Foundation, 33–93.
- Frisch, H. (2006). Motivation or capabilities? Israeli counterterrorism against Palestinian suicide bombings and violence. *Journal of Strategic Studies*, 29(5), 843–869.
- Ganor, B. (2005). *The Counter-Terrorism Puzzle: A Guide for Decision Makers*. New Brunswick, N.J.: Transaction.
- Gold, D. (2005). The Costs of Terrorism and the Costs of Countering Terrorism. *International Affairs Working Paper*, 2005-03.
- Guiora, A.N. (2008). Accountability and Effectiveness in Homeland Security. *Research Paper for the S.J. Quinney College of Law*, University of Utah.
- Hafez, M. M. & Hatfield, J. M. (2006). Do Targeted Assassinations Work? A Multivariate Analysis of Israel's Controversial Tactic during Al-Aqsa Uprising. *Studies in Conflict & Terrorism*, 29(4), 359–382.
- Hewitt, C. (1984). *The Effectiveness of Anti-Terrorist Policies*. Lanham: University Press of America.
- Horgan, J. & Braddock, K. (2010). Rehabilitating the Terrorists? Challenges in Assessing the Effectiveness of De-radicalization Programs. *Terrorism and Political Violence*, 22(2), 267–291.
- Jonas, J. and Harper, J. (2006). Effective Counterterrorism and the Limited Role of Predictive Data Mining. *Policy Analysis*, 584, 1–12.
- Josiger, W. J. (2006). Getting it Right: Understanding Effective Counter-Terrorism Strategies. *Paper prepared for the Annual Meeting of the International Studies Association*, 2006.
- Kaplan, E.H. et al. (2005). What Happened to Suicide Bombings in Israel? Insights from a Terror Stock Model. *Studies in Conflict & Terrorism*, 28(3), 225–235.
- Kassimeris, G. (2009). What Have We Learned If Anything? The Consequences of Counter-terrorism. *Paper prepared for the Annual Meeting of the International Studies Association*, 2009.
- Keister, T. (2008). When is a War Not a War? Defining & Achieving Victory in Iraq. *American Diplomacy*.
- Keohane, D. (2005). *The EU and counter-terrorism*. Centre for European Reform (CER): London.
- Kober, Avi (2007). Targeted Killing during the Second Intifada: The Quest for Effectiveness. *The Journal of Conflict Studies*, Summer 2007, 76–93.
- LaFree, G. (2006). *Efficacy of Counterterrorism Approaches: Examining Northern Ireland*. START Research Brief.
- Laffiteau, C. (2009). What counter-terrorism strategies characterize a constructive and cost effective response to al Qaeda inspired terrorism? *Paper prepared for the Annual Meeting of the International Studies Association*, 2009.
- Landes, W.M. (1978). An economic study of U.S. aircraft hijackings, 1961-1976. *Journal of Law and Economics*, 21(1), 1–31.
- Lum, C., Kenndy, L.W. & Sherley, A. (2006). Are counter-terrorism strategies effective? The results of the Campbell systematic review on counter-terrorism evaluation research. *Journal of Experimental Criminology*, 2(4), 489–516.
- Malinowski, T. (2008). Restoring Moral Authority: Ending Torture, Secret Detention, and the Prison at Guantanamo Bay. *The Annals of the Academy of Political and Social Science*, 618(July), 148–159.
- Malvesti, M. L. (2002). Bombing bin Laden: Assessing the Effectiveness of Air Strikes as a Counter-Terrorism Strategy. *The Fletcher Forum of World Affairs*, 26(1), 17–29.
- Manoharan, N. (2006). Counterterrorism Legislation in Sri Lanka. Evaluating Efficacy. *Policy Studies* 28.
- Mertus, J., & Sajjad, T. (2008). Human Rights and Human Insecurity: The Contributions of US Counterterrorism. *Journal of Human Rights*, 7(1), 2–24.
- Mickolus, E. (2002). How do We know we're winning the War against Terrorists? Issues in Measurement. *Studies in Conflict & Terrorism*, 25(3), 151–160.
- Monar, J. (2007). Common Threat and Common Response? The European Union's Counter-Terrorism Strategy and its Problems. *Government and Opposition*, 42(3), 292–313.
- Morag, N. et al. (2005). Measuring Success in Coping with Terrorism: The Israeli Case. *Studies in Conflict & Terrorism*, 28(4), 307–320.
- Mueller, J. & Stewart M.G. (2011). Terror, Security and Money: Balancing the Risks, Benefits, and Costs of Homeland Security. Paper prepared for presentation at the panel, "Terror and the Economy: Which Institutions Help Mitigate the Damage?" at the Annual Convention of the Midwest Political Science Association, Chicago, IL, April 1, 2011, unpublished.
- Noricks, D. M. E. (2009). Disengagement and Deradicalization: Processes and Programs. In *Social Science for Counterterrorism: Putting the Pieces Together*, edited by P.K Davis and K. Cragin. Santa Monica, CA: RAND, 11–70.

- Omotola, J. S. (2008). Assessing Counter-Terrorism Measures in Africa: Implications for Human Rights and National Security. *Conflict Trends*, no. 2, 41–48.
- Paser, D.A. & Paserman, M.D. (2007). The Shape of Things to Come? Assessing the Effectiveness of Suicide Attacks and Targeted Killings, IZA DP No. 2890.
- Pedahzur, A. & Perliger, A. (2010). The Consequences of Counterterrorist Policies in Israel. In *The Consequences of Counterterrorism*, edited by M. Crenshaw. New York: Russell Sage Foundation, 335–366.
- Perkoski, E. & Chenoweth, E. (2010). The Effectiveness of Counterterrorism in Spain: A New Approach. *Paper prepared for the Annual Meeting of the International Studies Association, New Orleans, February 2010*.
- Perl, R. (2007). Combating Terrorism: The Challenge of Measuring Effectiveness. *CRS Report for Congress*, updated March 12, 2007.
- Perliger, A., Pedahzur, A., & Zalmanovitch, Y. (2005). The Defensive Dimension of the Battle against Terrorism - An Analysis of Management of Terror Incidents in Jerusalem. *Journal of Contingencies and Crises Management*, 13(2), 79–91.
- Pratto, F., Fox, A. B., Pitpitan, E. V., Tan, J., Huntington, A., Santos, Jr., E. E., Ravishanker, N. and Pearson, A. R. (2009). The efficacy of terrorism and counter-terrorism in the second intifada: An intergroup approach. *Working Paper presented at the International Society for Political Psychology meeting, Dublin, July 2009*.
- Probst, P. (2005). Measuring Success in Countering Terrorism: Problems and Pitfalls. ISI 2005, *LNCS* 3495, 316–321.
- Prunckun Jr., H. W. & Mohr, P. B. (1997). Military deterrence of international terrorism: An evaluation of operation El Dorado Canyon. *Studies in Conflict & Terrorism*, 20(3), 267–280.
- Sandler, T., Arce, D.G. & Enders, W. (2009). An Evaluation of INTERPOL's Cooperative-based Counterterrorism Linkages. *Working Paper*, unpublished.
- Schmid, A.P. & Sing, R. (2009). Measuring Success and Failure in Terrorism and Counter-Terrorism. US Government Metrics of the Global War on Terror. In *After the War on Terror: Regional and Multilateral Perspectives on Counter-Terrorism Strategy*, edited by A. Schmid and G. Hindle. London: RUSI.
- Spencer, A. (2006). The Problems of Evaluating Counter-Terrorism. *UNISCI Discussion Papers*, No. 12.
- Stohl, M. (2006). Winners and Losers in the War on Terror: The Problem of Metrics. *Working Paper*.
- Tsvetovat, M., & Carley, K. M. (2006). On Effectiveness of Wiretap Programs in Mapping Social Networks. *Computer Mathematical Organization Theory*, 13, 63–87.
- TTSRL (2008). Measures of Counterterrorism and their Effect on Civil Peace. *Transnational Terrorism, Security, and the Rule of Law (TTSRL)*, FP6 framework project.
- TTSRL (2008). The EU Counterradicalization Strategy. Evaluating EU policies concerning causes of radicalization. *Transnational Terrorism, Security, and the Rule of Law (TTSRL)*, FP6 framework project.
- TTSRL (2007). Theoretical Treatise on Counter-Terrorism Approaches. *Transnational Terrorism, Security, and the Rule of Law (TTSRL)*, FP6 framework project.
- Tudge, C. (2004). When men have lost their reason. *New Statesman*, 12 April 2004. [<http://www.newstatesman.com/print/200404120016>]
- Ullman, H. (2006). Is the US winning or losing the global war on terror and how do we know? *Australian Journal of International Affairs*, 60(1), 29–41.
- Van Dongen, T. (2009). Break it Down: An Alternative Approach to Measuring Effectiveness in Counterterrorism. *Economics of Security Working Paper*, no. 23.
- Zussman, A. & Zussman, N. (2006). Assassinations: Evaluating the Effectiveness of an Israeli Counterterrorism Policy Using Stock Market Data. *Journal of Economic Perspectives*, 20(2), 193–206.

8 Annex

Table 2 Understanding of effectiveness of CT measures in academic studies

| Paper | Policy / instrument | Output | Outcome | Impact | |
|--------------------------------------|--|--|----------------|--|--|
| 9/11 Commission (2006) | Several (legal, judicial, military, aid) | (legal, police, - | - | Disruption of terrorist organisation (on various levels) and increase of target security | Attack occurrence |
| Alexander (2006) | Various | Establishment of a counter-terrorism department/structure of CT agencies | - | - | - |
| Araj (2008) | “State repression” (targeted killings) | - | - | - | Effect on suicide bombings |
| Ashour (2008) | Deradicalisation programmes | - | - | - | Level of violence |
| Barros (2003) | Various (political, economic effects) | - | - | - | Effect on assassinations and kidnappings |
| Beasley (2008) | Violent, non-violent, and socioeconomic | - | - | - | Rate of suicide terror attacks |
| Benmelech et al. (2010) | House demolitions by Israel | - | - | - | Palestinian suicide terror attacks |
| Block (2005) | French CT measures | - | - | Disruption of terrorist attacks | Prevention of terrorist attacks |
| Boucek (2008) | Deradicalisation programme | - | - | - | Recidivism |
| Brophy-Baermann and Conybeare (1994) | Israeli retaliations | - | - | - | Level of terrorist attacks |
| Brown (2007) | Aggressive tactics, invasive techniques, racial profiling | - | - | - | Reduction of the threat of terrorism |
| Byman (2006) | Targeted killings, fence erection | - | - | Disruption of terrorist organisations, public morale, prevention of movement, etc. | Number of Israeli fatalities |
| Collins (2004) | Military force, unilateral economic sanctions and multilateral sanctions against states which provide support for terrorist groups | - | - | - | Impact on state-supported terrorism measured by number of individuals killed |
| Drakos and Giannakopoulos (2009) | In general terms: measures that stop a terrorist incident | - | - | Probability that a terrorist incident is stopped by authorities | - |
| Dugan et al. (2009) | British interventions (curfew and search operations) | - | - | - | Impact on the risk of new attacks |
| Duyvesteyn (2008) | Use of armed force | - | - | - | Reduction of terrorist activity |

| | | | | |
|-------------------------------|--|--|---|---|
| Enders and Sandler (1993) | Metal detectors at airports, fortifying embassies, etc. | - | - | Level of terrorist attacks |
| Enders et al. (2009) | Interpol's proactive measures | - | - | Level of terrorist attacks |
| Frisch (2006) | Offensive and defensive measures (targeted killings, building wall) | - | Palestinian arrests | Number of Palestinian attacks, Israeli fatalities |
| Hafez and Hatfield (2006) | Targeted assassinations | - | - | Level of terrorism |
| Hewitt (1984) | Various (ceasefires & negotiations with terrorists, improving economic conditions, making reforms, collective punishments, emergency powers, the use of the security forces) | - | - | Level of terrorism |
| Horgan and Braddock (2010) | Deradicalisation and disengagement programmes | - | - | Terror level, recidivism |
| Josiger (2006) | Various, including legislation, police, reintegration, international cooperation | - | balance of security [reduction of terrorism] with the protection of civil liberties | |
| Kaplan and Mintz (2005) | Targeted killings and preemptive arrests | - | - | Rate of suicide attacks |
| Kober (2007) | Targeted killings | | Resources (recruits) of terrorists | Number of Palestinian terrorist attacks |
| Keohane (2005) | EU cooperation | Degree of EU cooperation; shift of power to the EU | - | - |
| Malinovski (2008) | Torture, extraordinary rendition, military courts, indefinite detention without trial | - | Recruitment capability through delegitimation of the enemy's values | - |
| Malvesti (2002) | Military air strikes | - | - | Prevention of terrorism |
| Mertus and Sajjad (2008) | Judicial and legal measures infringing on human rights | - | - | Reduction of terrorism |
| Monar (2007) | EU strategy | Action plan to combat terrorism | - | - |
| Noricks (2009) | Deradicalisation and disengagement programmes | - | - | Recidivism |
| Paser and Jaegerman (2007) | Targeted killings | - | - | Level of terrorism |
| Perlanger et al. (2005) | Defensive model of coping with terrorism | - | - | Terror incident damage (number of victims) |
| Prunckun Jr., and Mohr (1997) | Operation El Dorado Canyon, the April 1986 U.S. air raid on | - | - | Pattern of international terrorism |

| Libya | | | | |
|-----------------------------|--------------------------------|------------------------------|-------------------------------------|--------------------------------------|
| Tsvetovat and Carley (2007) | Wiretapping | - | Accurate mapping of covert networks | - |
| TTSRL (2008) | In general terms: CT measures | - | Radicalisation | - |
| TTSRL (2008) | Counterradicalisation policies | Correspondence with strategy | - | - |
| Ullman (2006) | Various | - | - | Reduction of the threat of terrorism |

Listing according to output,- outcome- and impact-effectiveness by authors.