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The economics of terrorism and counter-terrorism: A survey (Part II)

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The Economics of Terrorism and Counter-Terrorism: A Survey (Part II)

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The Economics of Terrorism and Counter-Terrorism: A Survey (Part II)

Abstract

This survey provides an in-depth analysis of existing research on the economic analysis of terrorism and counter-terrorist measures. First the existing evidence on the causes of terrorism is analyzed, then we consider the evidence of the consequences of terrorism and we demonstrate why it is important to regarding of the issue of counter-terrorism policy. Moreover the survey presents the existing knowledge on the interrelation between the economy and the issue of security and it incorporates analysis the level of knowledge about the causal chains between security and the economy. Also it focuses on perspective and methodologies from the discipline of economics but also refers to research from related disciplines (sociology, political science). It also assembles the knowledge on the impact of terrorism on the economy as reflected in macro-economic variables and its impact on specific sectors. Furthermore it assesses how potential an actual terrorist event determine consumer and producer behaviour, public policy, as well as terrorist responses to these policies. Finally a European perspective on the terrorism security annexes is discussed and here we analyze the causes of terrorism in Europe.

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The economics of security is one of the most important issues in our discipline, yet, the one least researched (Martin Feldstein (5. 1. 2007), Former President of the American Economics Association.

“Economic theory in particular can offer key insights, enabling governments to optimise their efforts to enhance security and growth” (ESRAB, 2006).

This paper consists of two parts (WP-nos. 3011 and 3012). Part I comprises chapters 1 to 4 and part II comprises chapters 5 to 9 – including also the references.

5 INTERACTION OF ACTORS OF INSECURITY AND SECURITY

This section concentrates on counter-terrorism policies and the dynamics between “actions of security and insecurity”. Earlier, we described the terrorists’ calculus, where the actual level of terrorist activity is dependent upon the costs, benefits and relative costs (opportunity costs) of terrorism. Consequently, counter-terrorism policies should reduce terrorist activity by (i) increasing of the costs of terrorism, (ii) reducing of the benefits from terrorist actions and (iii) making non-violent alternatives to terrorism more attractive (Frey and Luechinger 2008). An increase in the costs of terrorism is usually associated with an aggressive counter-terrorism strategy (deterrence) which uses harsh means such as pre-emption, retaliation or punishment. A reduction of terrorism benefits usually involves a rather defensive policy approach; this strategy acknowledges the main goals of terrorism (political and economic destabilization, and media attention) and tries to reduce payoffs from terrorist actions accordingly. Raising the opportunity costs of terrorism involves policies which offer positive incentives for potential terrorists. Implicitly, this line of argumentation is closely linked to the discussion of the ‘causes of terrorism’ which we presented in Section 3 of this contribution. By ameliorating conditions which may have otherwise provided incentives for terrorism (e.g. poverty, slow growth, repression, discrimination), it becomes less attractive for potential terrorists or terrorism supporters to engage in violence, even as the actual costs and benefits of terrorism do not change.

In the following, we will discuss several contributions which deal with counter-terrorism strategies along the aforementioned lines. Here, we focus on defensive policies as well as proactive ones; in any case, we will come back to the underlying argumentation of the terrorists’ calculus, i.e., to the policy effects on cost-benefit (and opportunity cost) considerations of terrorists. Still, we will also center on the repercussions of such strategies (i.e., the interaction of security measures and insecurity). As Enders and Sandler (2006) point out, security measures often do not take their full dynamic costs into consideration, failing to recognize that terrorist behavior is not static but adapts to security measures. In fact, terrorism, e.g., may increase instead of decrease when facing new or elevated security measures, so such repercussions add to the economic costs of security. Also, terror may not only increase over time, but also shift geographically, taking advantage of weakest links in relatively less protected areas. Moreover, security measures may not influence the level of terrorism but its tactics, e.g., by making skyjacking less attractive by increased airport security.⁴²

5.1 Defensive policies

5.1.1 Protecting targets against attacks

Protecting targets aims to raise the costs of an attack by increasing the difficulty for terrorists to strike and reach their target and by increasing the risk of failure (Enders and Sandler 2006).

⁴² Jackson et al. (2007) provide an extensive study on how certain terrorist groups (e.g., the IRA) have adopted to counter-terrorism measures. Evidently, groups such as the IRA have not reacted to counter-terrorism with a reduction of terrorism but with a change in their modus operandi. This means that we should always keep in mind when discussing the effectiveness of terrorism that counter-terrorism may produce a simple substitution and not a (desired) elimination effect.

Activities may include the installment of surveillance technology and placement of security personnel such as the introduction of metal detectors at airports in the 1970s or the fortification of embassies. Legal measures at national, regional or international level which lead to tightening of legal action taken against terrorists have a similar effect. Ultimately, all these actions aim at deterring terrorists from their terrorist activities in favor of other political means.

Enders and Sandler (2006) empirically analyze the effects of some protective measures, including the introduction of metal detectors at airports, the fortification of US embassies and the passing of international conventions. They show that metal detectors introduced in order to decrease skyjackings have proven effective insofar as they reduced the number of skyjackings by 12.2 incidents per quarter. However, rather than actually reducing terrorist activity, the introduction of metal detectors appears to have produced a shift of terrorist attention away from more costly skyjackings towards relatively “cheaper” hostage takings, indicated by an increase of 3.68 incidents per quarter of the latter. In contrast, international conventions⁴³ do not show to have had a significant effect on terrorist attacks, since these conventions do not as such reduce terrorists’ resource base or lower the relative costs of non-terrorist activities. While Landes (1978) and Cauley and Iksoon (1988) provides earlier evidence that increased security measures at airports (e.g., mandatory preboarding searches of passengers) has contributed to a reduction in airplane hijackings, Cauley and Iksoon (1988) similarly argue that substitution (transference) has taken place, where skyjackings have been replaced by “cheaper” means of terrorism (cf. Jackson et al. 2007)

However, continued attempts to target for example major airports such as Heathrow, who since 9/11 have seen a decisive increase in security measures, contradict the prediction that terrorists will seek the weakest link to minimize costs. It appears that they are willing to pay higher prices and take on greater risks for a potentially higher return on a more prestigious target.

5.1.2 Mitigating impacts

A complementary action to protecting targets is the mitigation of actual impacts, which in theory does not raise costs but aims to lower the benefits resulting from a terrorist attack (Enders and Sandler 2006). Frey (2004) and Frey and Luechinger (2004, 2008) suggests two measures to reduce the benefits derived from terrorism: (i) decentralization and (ii) changes in media reporting practices.⁴⁴ Obviously, these strategies are directly linked to the central short-run goals of terrorism, namely economic and political destabilization, and media attention.

Political decentralization (e.g., via federalism or another form of division of power) makes attacks on political targets less attractive; even as an attack is successful, the effect of the attack on the general polity is less sizeable, compared to a comparable attack in a centralized country (Frey and Luechinger 2004). Economic decentralization (which should develop rather automatically in market economies) has a similar effect on terrorism benefits; even the attacks

⁴³ These conventions include for example the UN Convention on the Prevention and Punishment of Crimes against Internationally Protected Persons (1973) and the UN Resolution against Taking Hostages (1985) and other conventions against hijackings.

⁴⁴ Neither of these approaches remains uncontested but a detailed discussion of their implications surpasses the scope of this document and is not necessary for the actual core argument.

of 9/11 had no lasting impact as non-affected personnel and market participants were able to quickly recoup the damages (*ibid.*). In general, decentralization decreases the level of immediate interdependency and consequently the degree of potential damage.

Changes in media practices on the other hand, rest on the recognition that media and terrorism live in a certain “symbiosis” (Enders and Sandler 2006). On the one hand, a terrorist event is a welcome story to the media to report on and to boost sales; on the other hand, terrorists rely on the media to reach a large audience, beyond the directly affected victims of an attack, so as to instill fear in society. As the media determines the “cognitive experience” of terrorism by an audience larger than the directly affected victims, and magnifies the impact through continuous reporting of the topic (even at the expense of other topics) it plays an important role in “managing citizen” fears either positively or negatively (Kunreuther 2002). One potential counter-terrorism strategy in this connection is provided by Frey and Luechinger (2008). They argue that by providing the media with abounding information on terrorist attacks, the government may manipulate media recognition of terrorist groups; if the government achieves to conceal the true perpetrator of an attack (e.g., by not recognizing the true perpetrator although it is known, thereby inducing free rider behavior of other groups), it may reduce the benefits of an attack that manifest in media attention, thus frustrating active terrorists.

Empirically, Dreher and Fischer (2008) offer first support for the idea that decentralization is associated with a decreased likelihood of experiencing transnational terrorist attacks. Here, spending (fiscal) decentralization has a much stronger effect on terrorism than actual political decentralization. Interestingly (but in line with the previous argumentation), decentralization is not shown to produce security inefficiencies (as popular discourse may suggest); rather decentralization appears to generate a positive feedback between security means (decentralization) and insecurity.

Considering the interactions between the media and terrorism, Nelson and Scott (1992) show that media coverage may induce additional terrorist acts. Similarly, Rohner and Frey (2007) show that media attention and terrorism share a bidirectional causality relationship, so increased media attention granger-causes more terrorist events, and vice versa. These empirical findings indicate that by influencing media coverage of terrorist actions, terrorist activity may also be influenced. Still, existing evidence is rather sparse. Moreover, one can assume that terrorist organizations find their own ways of publicizing successful attacks, not least through the medium of the internet, which has become a popular terrorist platform.

In summary, protective measures (decentralization, influencing media behavior) aim at reducing potential benefits of terrorist actions.⁴⁵ Sparse empirical evidence shows that related policies (decentralization) may indeed yield positive effects. Nevertheless, no empirical study implicitly shows that a reduction of benefits from an attack is linked to a reduction of future attacks; this is particularly true for the interaction of the media and terrorism, where evidence

⁴⁵ Recently, Frey and Rohner (2007) advocated another counter-terrorism strategy that aims at decreasing potential terrorism benefits. They introduce a simple game-theoretic model to illustrate the interactions between protective government policies and terrorism. The model focuses on terrorist attacks on cultural monuments, which naturally yield a high payoff for terrorists, making them preferred terrorist targets. When the government shows determination to rebuild a monument (by means of public announcements, reconstruction plans etc.), it lowers the potential benefits of a terrorist attack. Instead of deterrence (active protection), reconstruction (or the commitment to it) is shown to be a cost-efficient defensive policy means.

has just uncovered their symbiotic relationship. There exists the possibility that protective measures lead to a change in terrorists' behavior, so the effect of related counter-terrorism strategies is undermined. Even as such counter-terrorism strategies are successful in mitigating the effects of terrorist strikes, they may also induce a suite of substitution effects, which include a shift in targets, a change in the modes of attack, geographic transference between countries or in time. This implies that in order for related policies to be effective, they will need to address all possible modes of attacks, on all targets, in all possible countries, at all times. Given asymmetric information between terrorists and governments, this is hardly possible to achieve. This leads back to the question how to protect an economic system when the actual threats to security are unknown.

5.2 Proactive policies

5.2.1 Targeting terrorists' infrastructure

Proactive policies include measures such as employing intelligence and surveillance technologies to detect terrorist activity and capture perpetrators, the obstruction of terrorist financial flows and weapons supplies, as well as pre-emptive attacks. Beyond physical measures they can also include the tightening of legislation and curbing of citizen rights to increase difficulties for terrorists to organize, disseminate their information, recruit members, and so forth. In short, pre-emptive measures aim at starving terrorists of their (financial, human, physical, technological) resources, so as to disrupt their activities.

The interception of terrorist financing has surely received most attention within the literature analyzing the dynamic repercussions of proactive terrorist measures. This is not only due to the dependence of terrorist organizations on financial assets to implement their activities but also due to the possibility of detecting terrorist activity by tracing the money trail in the system. Yet, despite the potential elegance of this approach, it is difficult to actually implement it. Firstly, to effectively freeze assets of terrorists, cooperation between states and the banking sector is required, which (given disincentives to disclose information on money transactions) has proven difficult to establish (FitzGerald 2004). Secondly, terrorists have shown to circumvent the freezing of their assets through diversifying their income sources, but also by blurring the traceability of their transactions (Schneider 2002; Napoleoni 2003; Alexiev 2004). Al-Qaeda, the epitome of an elusive terrorist organization, receives money from sources ranging from private individuals to state sponsors, covered up as "development organizations" and "charities". Further, they employ techniques of blurring the traces of their transactions similar to the ones of organized crime (Schneider 2002). As a result, stringent measures to severely reduce their assets are said to have failed. Enders and Sandler (2006) liken the activities to curb illicit money flows to a "leaking bucket", whose success is at best temporary (cf. Addison and Murshed 2005) as terrorists find ways to circumvent regulations. What is more, when we think of terrorism as a "weapon of the poor", meaning that the financial needs of terrorists are often argued to be comparatively small (cf. Sandler et al. 2009), a disruption of terrorist finance may be even more difficult to achieve.

Apart from the failure to curb financial assets, the economics literature is pessimistic on the effectiveness of aggression to decrease human resources of terrorist organizations. The theory recognizes three channels through which proactive measures towards terror organizations could in fact aggravate terrorist behavior as response: firstly, aggression, specifically if it reduces freedoms of expression and therefore non-political means to express grievances will make non-terror activities relatively more costly, consequently leading to increased terrorist activity (Enders and Sandler 2006); secondly, aggression can fuel the legitimacy of terror organizations when their struggle for political rights is answered with a tightening of rights (Frey 2004); and thirdly, terror organizations may answer with a reorganization of their structures to evade aggression (Münkler 2004). Al-Qaeda again provides an example: the above mentioned elusiveness of this terror organization results from their success in decentralizing operations, which decreases the actual area of target and increases the independence of its functioning even if key leaders are caught (*ibid*).⁴⁶ Enders and Sandler (2006) provide the case study of the bombing of Libya in 1986⁴⁷ to show how aggression against terrorism is answered with further aggression. Their findings show that this retaliatory raid caused an immediate increase to over 38 terrorist attacks per quarter, which subsequently fell, yet remained at 12.7 incidents above the pre-intervention mean; that is, retaliation led to an increase rather than a reduction of terrorist attacks (Enders and Sandler 2006). Thus, coercive action towards terror organizations appears to result in a zero sum game which can potentially set of a spiral of violence – or as the literature concludes “deterrence may backfire” (Frey and Luechinger 2002).

As alternatives to aggression, Frey and Luechinger (2003) and Frey (2004) suggest a few “carrots” to induce terrorists to refrain from terrorist activities. Such benevolent measures may include, e.g., mindful of legal reprisal that terrorists are likely to face when giving up their illegal actions. Rather than raising the costs of terrorist activities, it is called for a lowering of the price when refraining from the latter. This could be achieved by, e.g., providing amnesty, re-socialization and political talks. Positive measures rather than inducing a zero or negative sum-game will at least in theory create a win-win situation where both sides (terrorist and the government) gain. Frey and Luechinger (2008) sum up some evidence suggesting that at least for Northern Ireland related policies (e.g., offering *Sinn Fein* as the IRA’s political arm negotiations) were successful in reducing violent activities. Frey (2004) himself recognizes that his tactics may induce adverse incentives to terrorists, resulting in the exploitation of positive measures and may be considered immoral, particularly by victims of terrorist attacks.⁴⁸

5.2.2 Targeting root causes of terrorism

The last policy approach that remains to be discussed focuses on targeting the “root causes” of terrorism. While the above sections summarized counter-terrorism strategies that target the “permissive factors” (Drakos and Gofas 2006b), this section will discuss approaches that aim

⁴⁶ Ironically, al-Qaeda has therefore achieved what some economists (e.g., Frey 2004) advice governments to do in order to decrease their vulnerability.

⁴⁷ This refers to the US attack on targets in Libya in response to the (supposed) bomb attack of Libyan terrorists on a West Berlin night club April 5, 1986.

⁴⁸ This criticism has been voiced in a review of Frey (2004) by Inbar, E. (2006). "Book Review: Bruno S. Frey, Dealing with Terrorism—Stick or Carrot." *European Journal of Political Economy* 22(343-344).

at eradicating the actual grievances on which terrorist actions are built, thus undermining terrorist legitimacy (e.g., recruitment, financing, popular support). In general, related strategies are linked to an increase in the opportunity costs of violence (Frey and Luechinger 2008). If we assume that the IRA used violence because there was no other way to voice their dissent, than offering them alternatives to violence (as discussed before) may also be considered as a way of targeting the roots of terrorism (here, the lack of representation) while similarly undermining terrorists' legitimacy. In general, targeting the roots of terrorism means to make non-violence comparatively more attractive for potential terrorists or terrorist supporters, instead of increasing the costs of terrorism or decreasing its benefits. Clearly, such strategies require (i) to identify the "true" causes of terrorism and (ii) to alter related conditions through policy actions in ways that reduce terrorist activity. This discussion is closely linked to the one in Section 3.

The main problem with targeting the root causes of terrorism is that existing evidence (especially when the analytical focus is global) does not deliver a clear result on which factors are actual roots of terrorism. What is more, different studies do not only stress the importance of different determinants (and thus advocate different policy solutions) but several studies also come to varying results with respect to the direction of influence of certain determinants.⁴⁹ The missing "one size fits all" result on terrorism causes makes any simple policy advice nearly impossible.

Clearly, evidence from country studies may be used to formulate policy advice suitable for the very country analyzed. For instance, as the evidence by Feridun and Sezgin (2008) indicates that economic underdevelopment encourages terrorism in Turkey, a sound policy advice is to foster economic development in this country. Still, it is unclear whether such strategies can be transferred to other countries. In any case, the analytical focus of the empirical analyses should be kept in mind when deducing policy implications from them.

Given that there is no "true" result on terrorism determinants, a number of (potentially) helpful counter-terrorism strategies can be thought of. Helpful strategies may include a reduction of economic, political (repression, inadequate representation etc.) and social (discrimination along ethnic or religious lines) underdevelopment. Also, political stabilization may work favorably in a reduction of terrorism. With respect to the empirical evidence on terrorism causes as presented in Section 3, an overall emphasis on political and institutional over economic factors seems to be advised.

On an international level, foreign aid (e.g., directed at sound education), assistance in economic and political transformation and international cooperation (e.g., with regard to the organization of international trade) may also be helpful. As stressed before, all of these strategies aim at making non-violence more attractive for potential terrorists and their supporters. However, several open questions remain. First, given that the empirics do not suggest a "true" root cause of terrorism, we cannot assess whether a certain strategy is helpful. Also, a strategy may be helpful but still constitute a waste of resources if other more effective ways of reducing terrorism exist (e.g. Sambanis, 2008). Second, the effectiveness of the suggested counter-terrorism strategies is thus very much context-dependent. Third, evidence is inconclusive on

⁴⁹ As discussed before, there are studies arguing in favor of a "pure" (either autocratic or democratic) political regime to constrain terrorism, whereas other stress the role of repression in fostering terrorism and of democracy in reducing it.

the interaction between various terrorism determinants and their links to terrorism. Such interactions may require a more holistic policy approach (i.e., tackling different terrorism roots simultaneously when their interaction is found to independently impact on terrorism).

In general, targeting the roots of terrorism may be effective when it makes non-violence more attractive and marginalizes terrorist groups. However, existing evidence does not allow for a clear strategy that is (globally) helpful in reducing terrorism. Consequently, this may lead to conflict mismanagement and a misallocation of resources. At the same time, targeting terrorism roots may be regarded as giving in to terrorists' demands. As game theory shows, concessions to terrorists may trigger new terrorist actions, may lead to changes in the structure of terrorist groups and other forms of adaption (e.g., Enders and Sandler 2006; Bolechow 2005). As terrorism has (from the point of view of terrorists) worked as an effective tool for bargaining, a targeting of terrorism roots may thus be counter-productive and breed new (potentially more radical) terrorism.

5.3 The determinants of the dynamics between security and insecurity

By way of a simplified summary, defensive policies seem to incur substitution effects, changing the mode, target and timing of actual terrorist attacks, while proactive policies, whether benevolent or aggressive, whether tackling the symptoms or causes of terrorism appear to change the structure and organization of terror organizations. Overall, the theory and available data suggest that in fact, terrorism, even if it has not become more frequent, has already and will increasingly (i) become more severe, (ii) shift location towards places with relatively less security measures in place, such as the Middle East and Asia where it also encounters more ready support and (iii) has adapted its strategies and organizational structures to evade proactive policies. Even though no statistical prove may be available for the latter, al-Qaeda provides an illustrative example how a terrorist organization can render a high security environment impotent.

The literature predominantly suggests that the relative price of terrorist activities versus non-terrorist activities constitutes the key determinant for terrorist responses to counter-terrorist measures. Yet, as the above section has shown, there are several other determinants which (although having received less attention) appear to be critical:

First, the end of a policy, particularly the differentiation whether to protect targets, counter symptoms or actual root causes appears to be a factor in defining terrorist reactions to security measures. However, it is questionable whether the actual determinant is in fact the objective of the policy or rather the means employed to achieve these ends.

Irrespective of the actual goal (e.g., democracy in Iraq), the tools employed to reach this goal have proven to trigger potentially strong (negative) reactions. Essentially, the literature identifies negative repercussions from aggressive policies, and the possibility of a spiral of violence. Benevolence, in contrast, implies at least in theory a positive sum game or a win-win solution for both terrorists and targets (e.g., Anderton and Carter 2005). However, no empirical evidence exists that demonstrates this positive relation. Yet, at the most basic level, there is widespread agreement that terrorism requires economic and political but not military solutions.

Ultimately, the responses to security measures are determined by the actual preferences of the terror agents themselves. The summary above has shown that the simple model of terrorism behavior may be correct in its essence (terrorists as rational agents). Yet, it is too simplistic and requires extension to fully account for all possible reactions.

For instance, Addison and Murshed (2005) contend that the motivation of terrorists is important to understanding reactions to response measures. In a simplified model, Addison and Murshed (2005) differentiate between degrees of militancy, suggesting that more militant terrorist members will be less easily deterred from violent means than less militant terrorists.⁵⁰

Applying this framework to different players of terror organizations, it is possible to differentiate between three agents who are likely to differ in degrees of militancy and thus motivation:

Terrorist leaders are likely to fall into the category of the more militant terrorist actors as understood by Addison and Murshed (2005). Consequently, unless their respective grievances are addressed, they will seek to circumvent security measures most ardently in favor of terrorist means. Their elasticity to substitute terrorism with non-violent action is likely to be small, if not zero or even negative.

Terrorist recruits could have less militant motivations, i.e., they may be driven by other (e.g. economic) factors than merely political goals. Therefore, a price change in the possible alternatives may be more successful in changing their behavior.⁵¹ Thus, it is possible to hypothesize that their elasticity to substitute terrorism for non-terrorist actions is likely to be greater than zero. Within the group of terrorist recruits, Frey (2004) makes the important distinction between actual terrorists and potential future terrorists. While disincentives to choose terrorist activities have to be created for the latter, specific incentives for the first have to be created in order to enable them to renounce their violent behavior (*ibid*).

Terrorist support groups are agents not directly involved in the actual planning and execution of terrorist acts but those who provide logistic support to terrorist organizations. As they often constitute the constituencies terrorists are fighting for, their support (and in reverse, a targeting to reduce their support) can be of significant importance. It is difficult to estimate their preferences but since they are not directly engaged in terrorist activities, their political objectives could weigh less than other (e.g., economic) considerations. Therefore, it could be inferred that their demand for non-terrorist actions is more price elastic.

Furthermore, it may be helpful not only to look at the hierarchy of terrorist organizations to assess the effectiveness of counter-terrorism policies (and their interaction with terrorism) but also to look at individual organizations. As Blomberg et al. (2009) find, recidivist terrorist groups (running prolonged campaigns) are more likely to be influenced by socio-economic

⁵⁰ To illustrate this differentiation, while a more militant terrorist may have exclusively political objectives, a less militant actor may support the activities not only for political purposes but also for economic gain (through e.g. selling weapons, information, or other goods and services). With increased deterrence or alternative income opportunities, the latter may give up his political objectives in order not to jeopardise the economic gain.

⁵¹ Abrahms (2008) argues that (rank-and-file) terrorists do not (primarily) join terrorist groups because of ideological preferences but because they want to form or maintain social bonds (e.g., friendships). In this case, offering alternatives to violence may be a poorer (less efficient) counter-terrorism strategy than an attack on these very social bonds (e.g., via an infiltration of a group and the spread of mistrust). Although Abrahms (2008) strongly argues against the standard rational choice framework (on which we rely here), it may nevertheless help to explain phenomena such as “unclaimed” terrorism (where no group takes responsibility) and terrorism in closed societies (in which terrorism does not gain publicity). See also Harrison (2009) for an empirical work on terrorism in the USSR as an example of the mechanics of terrorism and counter-terrorism in a closed society.

and political factors than groups attacking only sporadically. This result may indicate that counter-terrorism focusing on an amelioration of terrorism root causes (to address the concerns of terrorist groups) may be only effective once terrorists have started a prolonged campaign.

Given that terrorists not only form organizations but also more loose networks, e.g., as al-Qaeda (e.g., Reuter 2004), an economic analysis of the issue of networks and terrorism may also be helpful to understand how such networks are run and how appropriate counter-terrorism measures may look. Here, Siqueira and Sandler (2009) provide a recent analysis of this issue. Future research on this issue may help to design counter-terrorism measures appropriate for dealing with the threat of loose terrorist networks (in comparison to more “traditional” terrorist organizations).

Lastly, the outcomes of the analysis of response reactions may also be influenced by the indicators used to measure terrorist actions. Most knowledge on terrorist trends and patterns is based on data measuring the frequency and severity of terrorist attacks as the only indicator of change. However, it is impossible to conclude with certainty that a change in number and severity of attacks provides the best indicator for a change in terror activity. By contrast a prolonged period of time without a terror event does not necessarily mean the ceasing of terror activity; a large scale strike could be in preparation. In other words, impressions of the nature of change are limited to the available indicators, yet these may not be the most representative for the real degree and nature of terror activity.

6 ECONOMIC EFFECTS OF ANTI-TERRORISM POLICY

The economic impacts of anti-terror measures have been classified as the “indirect costs of terrorism” which result from the actions of both public and private agents to protect themselves against the impact of a terrorist attack or to prevent a terrorist attack (Brück 2006). Estimating these economic impacts requires accounting for direct effects, resulting from the expenditures invested in security measures and indirect impacts which derive from (i) the opportunity costs of these security investments and from (ii) dynamic effects of externalities and spillover effects. The economic impacts of security measures should further account for their actual impact on terror behavior or the effectiveness of the chosen security measures.

Two broad classifications of security measures can be identified in the literature. Enders and Sandler (2006) differentiate between defensive and pro-active security measures: the former broadly concentrate on protecting targets from attacks or mitigating the impacts in case of attack; the latter concentrate on fighting the threat itself, i.e., target terrorists and terror organizations in an attempt to undermine their capacity and activities by reducing their resource base. As discussed earlier, both approaches aim at influencing the cost-benefit (and opportunity cost) considerations of terrorist leaders, active terrorists and terrorist supporters.

Frey (2004) classifies security measures not with respect to their object of focus (targets versus terrorists) but rather with regard to the adopted approach. He identifies “deterrence” in

contrast to “positive” or benevolent measures.⁵² The first strategy incorporates both “physical” as well as legal measures aiming to deter terrorists from their activities; the second points towards measures that create incentives which induce terrorists to replace their acts of political violence with non-violent means.

Importantly, these classifications are not mutually exclusive, i.e., they do not provide alternative but complementary classifications, as illustrated in Table 2 below.

Table 2: Classification of different types of counter-terror measures

	Defensive policies	Pro-active policies
Deterrence policies / negative incentives	<u>Increasing the costs of terror</u> e.g., surveillance and protection of targets	<u>Decreasing resource endowments of terror organizations</u> e.g., intelligence and military operations
Benevolent policies / positive incentives	<u>Decreasing the benefits derived</u> e.g., decentralization of targets, decreasing media attention	<u>Increasing opportunity costs of terrorism</u> e.g., tackling grievances /root causes of terrorism, re-socialization

In practice, “defensive policies” entail direct actions (such as investments in security technologies) and indirect actions including changes in consumption, investment and saving patterns to avoid exposure to risk situations.

“Pro-active policies” incorporate all measures that aim to undermine terrorist activity, directly through interrupting their supply of resources including financial assets, arms, recruits etc; measures can range from intelligence operations, to military strikes (e.g., Iraq and Afghanistan) (Enders and Sandler 2006).

Within these two broad categories, it is possible to identify two sub-categories: defensive measures can be differentiated whether they protect singular identified targets (i.e., raise the costs of terrorism) or whether they attempt to mitigate the impacts of an actual terrorist attack (i.e., decrease the benefits of terrorist strikes); pro-active measures can be differentiated whether they merely target the symptoms (i.e., inducing cost and benefit effects) or the root causes of terrorism (i.e., increase the opportunity costs of terrorism).

The economic literature explains the choice of counter-terrorism measures (especially in the case of transnational terrorism) mainly by the public-private good nature of security. Defensive policies are largely a private good, where benefits of security provision are mostly internalized by the investor, while pro-active policies exhibit characteristics of a public good (Sandler and Siqueira 2006). Game-theoretic approaches show that, given the absence of

⁵² Here, “deterrence” not only refers to (traditionally military) acts of preventing (terrorists’) actions by instilling fear (e.g., retaliatory strikes) but is linked to a broader set of acts (e.g., surveillance, protection, intelligence operations).

coordination mechanisms that make all to take proactive measures, countries will be better off to take defensive measures and free ride on the pro-active measures of others in the case of transnational terrorism. This consequently may lead to an oversupply of defensive and an undersupply of pro-active measures.

The public-private good nature of security provision increases the need for cooperation at the international level between countries, and at national level between the private and public sector. The main obstacle is to overcome persistent coordination failures between different agents. Sandler and Siqueira (2006) conclude that leadership is apt to lessen inefficiency in providing defensive measures, yet fails to improve efficiency for pre-emptive measures.

When considering the factors that induce or prevent cooperation to enhance security, situations of (international) under- and over-supply of security (i.e., counter-terrorism measures) should not be overlooked, providing further needs for international coordination (cf. Sandler and Lapan 1988). Considering an under-supply of security, some states (often so-called “failed” states) are known to tolerate the activities of terrorist organizations in their territory in exchange for no direct harm at the expense of other nations, which is referred to as “paid riding” by Lee (1988) and Lee and Sandler (1988). In the case of over-supply of counter-terrorism in a country, terrorist attacks may be diverted to less protected areas (cf. Enders and Sandler 2006). These two phenomena make multilateral cooperation even more important, yet, as practice shows, not easier (Enders and Sandler 2006).

In the following, we want to discuss existing theoretical and empirical studies that analyze the economic effects of counter-terrorism policies at (i) the micro level, (ii) across industry sectors, (iii) the macro level and (iv) a global level. We also want to briefly discuss the political effects of counter-terrorism policies.

6.1 Micro-economic impacts

Just as in Section 4, the underlying micro-economic processes are explained before the aggregate impacts at the macro level are discussed. At micro-economic levels, security measures of economic agents can include direct expenditures on security technologies or indirect changes in consumption and investment behavior to hedge against the risk of falling victim to an attack. In addition, dynamic impacts of these changed consumption and investment patterns have to be accounted for.

6.1.1 Security measures of consumers and households

Sound research on measures of households to enhance levels of security hardly exists, even after 9/11. Consequently, not much more information is available than anecdotal evidence, such as accounts of panic purchases of antibiotics following the anthrax scares in the US in 2001. In contrast, a few localized studies (cf. West and Orr 2005) suggest that the American public’s security measures are far less drastic than related anecdotes suggest. For example, a 2004 New York Times national survey revealed that households have hardly taken action to prepare themselves against a terrorist attack: 61% of the respondents had not put together an emergency food kit with water, and 70% stated that they had not chosen a family meeting place or communications plan in the event of an attack (in West and Orr 2005).

However, even if there is little actual investment in security equipment, consumption and savings preferences are influenced by security considerations.⁵³ These changes in demand patterns due to risk aversion become visible in the impacts on different sectors of the economy, some of which (as we will discuss later) have suffered substantial losses due to fear of terrorism. As an important policy conclusion, Drakos and Kutan (2003) point out that state aid to companies suffering from adjustments in consumer demand due to terrorism will be futile in cases where demand has permanently changed.

6.1.2 Security measures of the private sector

The available options of security measures of companies are very similar to households: investment in security equipment and technologies, and management decisions to hedge against the risk of a terrorist attack, reflected e.g. in investment decisions. In theory, companies that face direct threats from terrorism have to incur expenses for security technology, insurance cover and often have to pay a risk premium to their employees in the form of higher wages and salaries; actual quantities depend on the nature of the threat and the respective sector.

The underlying factor that drives security spending arises from a company's and its managers' degree of risk aversion. Both the academic and practical literature agrees that risk aversion and the willingness to accept risk vary markedly across time, space but especially between individual managers. A study by Ryans and Shanklin (1980) shows that in 1980, 82 top international officials from US and overseas multinationals ranked terrorism as a key barrier to investment. In contrast, PricewaterhouseCoopers 10th Annual Global CEO Survey in 2006 (PricewaterhouseCooper 2007) concludes that CEOs (even after the unprecedented attacks of 9/11) are less worried about unforeseen shocks such as terrorism or natural disasters but rather about an overregulation of the economy.⁵⁴ The report further highlights how degrees of risk perceptions differ across individual CEOs, across geographic areas and with respect to economic conditions. Michel-Kerjan and Pedell (2006) arrive at similar conclusions regarding the perceived risk of terrorism in a study which compares the up-take of terrorism insurance cover in Germany and the US in the years after the introduction of the respective terrorism risk insurance acts. On the one hand, they argue that a suite of factors other than an actually heightened sense of insecurity⁵⁵ account for the increased up-take of terrorism risk insurance; on the other, they provide data from a US Treasury Survey, which finds that 90% of respondents to a US Treasury survey that did *not* purchase terrorism insurance believe "it will not happen to them".

Consistent with this low risk perception, McKinsey (2006) finds that only three out of ten respondents report that their companies have taken active steps to prepare for any one of the following scenarios that could harm virtually any company: a pandemic, a natural disaster or

⁵³ However, such security considerations are also very likely driven by fears of "ordinary" crime rather than by the fear of terrorism.

⁵⁴ Although no direct reference to security measures were made in this study, it could be inferred that companies are more worried about negative impacts of counter-terrorism measures involving security regulations on their businesses than about terrorism itself.

⁵⁵ These factors include regulatory measures, reduced prices for terrorist coverage and greater concern about possible liability under the Sarbanes-Oxley Act, should executives be deemed to have failed to protect corporate assets.

increased geopolitical instability, such as terrorism.⁵⁶ In a similar vein, PricewaterhouseCoopers 10th Annual CEO survey shows that “of all the threats, availability of key skills and low-cost competition are the two that companies are addressing with significant resources”, whereas terrorism does not induce significant spending (PricewaterhouseCooper 2007). Both studies offer support for Suder's (2004) main argument, who points to the necessity to incorporate geo-political risk (including terrorism) into risk assessment strategies.

Higher levels of risk further impact investment not only due to a change in allocation of resources but also due to an aversion to commit to new projects due to uncertainty (Brück 2006). Yet, Purnell and Wainstein (1981) conclude that at least in the case of US businesses, neither the costs of terrorism nor the consequent costs of security measures seem to significantly impact profitability that US businesses would pull out of countries affected by terrorism. Yet, aggregate patterns of investment flows contradict this optimistic conclusion as will be shown below.

The limited concern about terrorism is not surprising, given that only specific sectors are likely to face a direct threat, and given that indirect terrorist threats work through other channels, i.e. changes in demand, disruption in supply chains and other operation risks. In other words, terrorism is likely to be addressed within other risk factors. But even if terrorism is addressed within these wider sets of risks, Buehler and Pritsch (2003) suggest that the corporate meltdowns of recent years show that many companies neither manage risk well nor fully understand the risks they are taking.

A potentially even more important reason for the lack of security measures could derive from the complexity to manage terrorism risk which arises from several factors such as the interdependent security environment in which businesses are located; the elusive threat and dynamic uncertainty created by terrorism; and the significance of government actions to increase or decrease the threat level that businesses face. Especially the first and third point create large disincentives to security investments, as the effectiveness of protection against terrorism is dependent on the level of protection of the weakest link; thus, investment by one company does not necessarily mean an actually enhanced level of security if other companies or government fail to cooperate.

In conclusion, it is necessary to ask whether businesses' little security investments are justified, given the low probability nature of terrorist events, or whether they are in fact underinvesting at the possible expense not only of their operations but also society at large, given that a terrorist attack can incur costs that stretch far beyond companies' boundaries (as 9/11 and other events have shown). These interdependencies give rise to the debate about public-private partnerships to overcome coordination failures between companies to ensure adequate security standards in industries. As the rest of this section will show, regulations can have significant repercussions on economic competitiveness, leading back to the above mentioned trade-off between scaling down on efficiency expectations and enhancing the security of the overall system.

⁵⁶ The McKinsey Quarterly conducted the survey in March 2006 and received 3,470 responses from a worldwide representative sample of business executives, 44 percent of whom are CEOs or other C-level executives. Ranked according to importance, the three most important risks against which companies prepare are major regulatory changes (58%); substantial changes in currencies, interest rates or inflation; and a global or regional slow down. In contrast, only 26% prepare for geopolitical instability (e.g., terrorism).

6.1.3 Security measures at government level

While private agents' activities are mainly focused on enhancing their own level of security through protective measures, governments face the responsibility to allocate their available resources between defensive and pro-active measures.⁵⁷ The choice between the two is critical, especially regarding their actual impact on enhancing the security level of a country.⁵⁸ Enders and Sandler (2006) find that there is a proclivity to favor defensive counter-terrorist measures over pro-active ones, which will result in equilibrium with socially inferior payoffs when compared with pro-active responses. Pro-active policies tend to provide purely public benefits to all potential targets and are usually undersupplied, whereas defensive policies tend to yield a strong share of provider-specific benefits and are often oversupplied. The reaction to 9/11 has been a mix of defensive measures (e.g., security regulations at borders and transport hubs) and pro-active ones (the global pursuit of terrorists). Yet, while governments shoulder the costs of pro-active measures, it is the private sector and households who appear to be carrying much of the burden of e.g. regulatory protection measures by government. It has been estimated that the private sector will face about US\$ 10 billion a year due to US homeland security measures, although initially they could be much higher, i.e. in the range of US\$ 46 billion to US\$ 76 billion (Stevens 2003). Thus, governments' regulatory measures to enhance security can have significant impacts on the economy.

This leads to the question of appropriate government involvement in security provision. In this respect, the case of security provision in the aviation sector provides an illustrative example: The fact that security at one airport can affect the well-being of those at other airports provides an economic justification for governmental involvement in aviation security (Coughlin et al. 2002). A fundamental question is whether the role of the state should be restricted to setting and monitoring security standards or whether its role should also include the financing and implementation of security. In the US, in a controversial change the federal government has assumed responsibility for the actual provision of aviation security. Proponents of this change argue that (relative to private provision) public security provision reduces the incentives to reduce quality through cost reductions. Still, a public agency may not provide security services efficiently as it operates in a monopolistic way. Furthermore, a public agency may provide an excessive amount of security, thus incurring unnecessary expenses because it is likely to be judged on its security record and not on all the attributes encompassed by air transportation services for consumers. Thus, economic theory does not provide a clear answer to what is likely to be a continuing source of controversy - the appropriate scope of governmental involvement in aviation security.

6.2 Impacts across sectors

Congruently to the varying degree to which sectors are affected by direct effects of terrorism, the economic repercussions of security measures impact various sectors in different ways.

⁵⁷ Note that while governments are mandated to provide security (e.g., via military checkpoints), civilian actions (e.g., interventions by bystanders against terrorism) may also matter to the effectiveness of terrorism and thus security measures (Harrison 2006b). Fostering civilian intervention (through government policies) may be another way of countering terrorism, producing distinct costs and benefits.

⁵⁸ Governments may again also consider the international effects of counter-terrorism, i.e., the consequences of an (international) under- and over-supply of security (i.e., counter-terrorism measures) should not be overlooked.

Those sectors facing direct risks of terrorism are bound to incur the most costs to protect themselves against an attack. Particularly, the transport industry has invested large amounts into enhanced security.⁵⁹ While terrorist attacks on transport and infrastructure have happened in the past, it was 9/11 which induced major increases in security measures to be applied across the entire transport sector (aviation, maritime transport, road and rail).

The aviation industry surely was the sector strongest hit by security measures, firstly due to stringent security regulations introduced after 9/11, and secondly due to severe drops in demand in cargo as well as passenger traffic due to risk averse customers.⁶⁰ Since 9/11 it has been estimated that airlines have spent US\$ 43 billion on security measures, including more thorough baggage checks, greater in-flight inspection and new regulations for secure cockpit doors (World Bank 2003, in DFAT 2004).⁶¹ In the US, the US Aviation and Transportation Security Act of 2001 estimated the cost for the federal government at around US\$ 9.3 between 2002 and 2009. Airport operator's additional costs are expected to be around US\$ 56 million annually (Coughlin et al. 2002). Some of these costs have been shifted to customers: in response to the enhanced security, many airlines have started to add "security surcharges", resulting in fee increases of up to US\$ 8 per person or within the range of US\$ 0.10 to 0.15 per kg of cargo (Walkenhorst and Dihel 2002). The findings of Blalock et al. (2007) in this connection show that the implementation of baggage screening in the US after 9/11 has led to a considerable reduction in demand for air travel, even after controlling for other effects which may have simultaneously affected travel demand. That is, the study shows that counter-terrorism measures actually worsened the situation of an industry sector already hit by terrorism; the findings imply a trade-off between security (baggage screening) and industry profitability.

In the shipping industry, a series of measures aimed at strengthening maritime security have been adopted by the International Maritime Organization (IMO) which includes e.g. the International Ship and Port Facility Code (ISPS) in December 2002. The costs of implementing the ISPS to ship operators (including the installing of security equipment) has been estimated to reach US\$ 1.3 billion and ongoing operating cost of around US\$ 730 million annually. System wide procedural changes, though difficult to account for, have been estimated to amount to US\$ 282 million. The overall costs of those transport counter-terrorism measures were estimated in 2003 to amount to over US\$ 2 billion (in DFAT 2004).

Yet, increased security may not only incur negative impacts. At least in the case of the financial sector, the introduction of tighter monitoring of financial transactions seems to have had some positive returns. A survey on Anti-Money Laundering (AML) initiatives in the banking and financial sector implemented by PricewaterhouseCooper (2005) shows that AML initiatives are seen to contribute to improve competitiveness in the long run; still, they may disadvantage those countries with more stringent requirements if implemented unevenly across countries. Even as AML initiatives are one of the biggest drivers of increased compliance costs in the Western hemisphere and as smaller banks are beginning to feel the pressure and

⁵⁹ The figures given below, are based on estimates shortly after 9/11, thus, they are provided merely to give a dimension but should not be considered accurate in the present context.

⁶⁰ The negative effects of terrorism (the 9/11 attacks) are documented, e.g., by Ito and Lee (2005) who find a substantial decrease in demand for air travel after the 9/11 terrorist attacks.

⁶¹ DFAT is the abbreviation for the *Australian Department of Foreign Affairs and Trade* (henceforth *DFAT*).

complain about this new regulatory burden, the industry in general believes that the approach is justified within the current (in-) security environment and the role of financial flows.

In general, security investments could contribute to improving efficiency and effectiveness of specific sectors and the economy as a whole, especially where security against terrorism can be coupled with general security issues (DFAT 2004). Yet, so far no analysis exists that demonstrates potential positive impacts of enhanced security on overall operations.

Apart from the direct costs that sectors incur to protect themselves and society against terrorism, changes in demand and consumption patterns, arising out of security concerns of clients and customers as discussed above may have significant impacts on those sectors, through which customers face a direct risk of terrorism.

This includes the transport sector, and specifically the aviation industry which has received most attention in the literature. Airlines had already been facing difficulties before 9/11; the subsequent drops in demand which hit particularly American airlines led to estimated losses for IATA members of US\$ 15 billion in 2001 (Drakos 2004) and an additional aggregate loss of US\$ 12 billion in 2002. Boeing Commercial Airplanes announced a 30,000 manpower reduction (Hooke 2006). It is noteworthy, that the low-cost sector did not suffer from this decline: Southwest, jetBlue in the US and Ryanair and Easyjet in Europe did not only grow but were among the few to record profits.

Tourism is another sector which suffers significantly from changes in demand due to risk aversion. Either it will suffer from terrorism as a response to increased security measures or increased (perceived) vulnerability. Table 3 gives an overview of the effects of terrorism on tourism in affected countries. We discuss these studies (and others) in more detail below.

Table 3: Some Evidence on the Impact of Terrorism on Tourism

Study	Analytical Scope	Main Results
Enders and Sandler (1991)	Spain, Monthly Data 1970-1988	Terrorism negatively affects the number of visitors of Spain (tourists). There is no evidence of reverse causation.
Enders et al. (1992)	Greece, Italy and Austria, Quarterly Data 1974-1988	Greece, Italy and Austria suffered severe revenue losses from tourism as a consequence of terrorism.
Fleischer and Buccola (2002)	Israel, 1987-1999	Foreign tourism is sensitive to terrorism, while domestic terrorism is not. Shifts from foreign to domestic terrorism in the face of terrorism cannot compensate for losses due to reduced international tourism.
Llorca-Vivero (2008)	Cross-Sectional Gravity Model, 2001-2003	Terrorism works as “bad advertisement”, making tourism in targeted countries less attractive. This effect is stronger for developing countries.

Aly and Strazicich (2000)	Egypt and Israel, 1955-1997 and 1971-1997	While terrorism (along with instability and external war) negatively affect tourism flows, the tourism sector remains important as tourism flows are able to recuperate after negative shocks.
Pizam and Fleischer (2002)	Israel, Monthly Data 1991-2001	A high frequency of terrorism is more dangerous to tourism flows than the severity of these attacks.
Drakos and Kutan (2003)	Greece, Italy and Turkey, Monthly Data 1991-2000	Terrorism reduces tourist arrivals, reducing market shares of targeted countries. Terrorism also produces regional spill-over effects, making tourism in a “terrorism infected” region generally less attractive.

For Spain, which has not only suffered from ETA but also other (mostly left-wing) terrorist groups, it has been estimated that a typical terrorist act scares away over 140,000 visitors, combining all monthly impacts (Enders and Sandler 1991). Enders et al. (1992) estimate the actual losses in tourism revenue for Austria, Italy and Greece to amount to US\$ 4.538 billion, US\$ 1.159 billion and US\$ 0.77 billion, respectively, between 1974 and 1988.⁶² For the same period, continental Europe as a whole lost US\$ 16.145 billion due to terrorism (total tourist revenues in 1988 were US\$ 74.401 billion).⁶³ This highlights the significance in tourism losses but also the variability of losses across countries. While Austria, Greece and continental Europe in general lost substantial portions of their revenues (40%, 23% and 21%, respectively), the losses in Italy amounted “only” to 6%. Negative relations between terrorism and tourist demand have also been observed in other countries, including Israel and Turkey. Fleischer and Buccola (2002) estimating a supply and demand model of the Israeli hotel industry between 1992 and 1998, calculate a 1.27% loss of total revenues over this period, which rises with a deterioration of the situation. That is, evidence in general shows that terrorism negatively affects the tourism industry because tourists factor in terrorism as a risk when planning their holidays. The findings of Llorca-Vivero (2008) add to this view as the study shows that both domestic and transnational terrorist attacks enter a tourist’s calculus when making traveling choices.

Not only impacts but also the immediacy with which these impacts come into effect seem to vary strongly: while Enders and Sandler (1991) and Fleischer and Buccola (2002) find relatively immediate effects of terrorism on tourism, i.e. after two to three months for Spain and Israel respectively, Enders et al. (1992) find a $\frac{3}{4}$ lag before terrorism affects tourism in Greece, while tourism remains unaffected by a terrorist incident until a full 18 to 21 months

⁶² This was calculated in 1988 terms, using a real interest rate of 5%. For comparative purposes, total revenues in these countries in 1988 amounted to \$11.149 billion, \$19.311 billion and \$3.29 billion respectively. Note that we, inter alia, draw on information from Frey and Luechinger (2005) and Frey et al. (2007) when discussing the links between terrorism and tourism in this subsection.

⁶³ Note the methodological difficult to find an appropriate counterfactual: not the number of tourists before the attack should be taken as point of comparison, but the estimated increased number at the time of the terrorist attack.

afterwards in the case of continental Europe and Austria respectively. Frey and Luechinger (2005) explain these variations with the differences in the structure of terror campaigns not just across countries but also across time. Differences in time lags could further stem from differences in booking systems, where existing bookings are kept while changes only become apparent in the number of new bookings.

Even if impacts are significant, research shows that these effects are transitory. Yet, empirical research provides no unambiguous conclusion regarding the relationship between continued attacks and permanency of impacts: Aly and Strazicich (2000) studying annual bed nights in Egypt and Israel conclude that the impacts on the tourism sector remain transitory despite continued acts of terror and regional instability. Pizam and Fleischer (2002) in contrast, focusing on Israel argue that the tourist industry can recover even from severe acts of terrorism as long as the terrorist acts are not repeated. Thus, when acts of terrorism (whether of high or low severity) occur at high frequency and regular intervals, tourism demand will constantly decrease, and eventually the destination's tourism industry will come to a standstill. It is interesting to note that the frequency of attacks seems to influence tourism, while the severity of an attack seems not to influence tourism demand.

A second effect which has been researched is trans-boundary impacts of terrorism on other tourist destinations, especially neighboring countries. Of importance here is Drakos and Kutan's (2003) study on spillover and contagion effects. Using monthly data for the period 1991 to 2000, they investigate the effect of terrorism in Greece, Israel and Turkey on each other's market share, with Italy serving as a control country, representing the rest of the Mediterranean region. They find significant substitution effects and also empirical evidence for contagion effects. Only around 11% of aggregate losses in market shares are directed towards other destinations within the group of countries under consideration, whereas around 89% flow out into safer regions (in Frey et al. 2007). This demonstrates the necessity to understand fears of tourists to base strategic and operational marketing strategies on them (Dolnicar 2005).

Yet, even sectors that are not directly targeted by terrorism can be negatively affected by security measures. As shown above, some of the costs of security investments in the transport sector have been passed on to clients rather than having been fully internalized by the companies themselves. Consequently, trading sectors relying on their services will face increased costs not in the form of higher transport fees but also in the form of longer transport durations and delays as will be shown in the section below.

In contrast to these negative repercussions, those sectors providing security technologies and services, namely the defence and security industries⁶⁴, benefit from investments into security technologies. The military response to the attacks of 9/11 reversed the declining trend in military expenditure which had set in with the end of the Cold War. According to the *Stockholm*

⁶⁴ The defence and security industry share some commonalities (e.g., both sectors may offer offensive means). However, there are also differences. For instance, the defence industry supplies the armed forces, while the security industry supplies public police forces and also private security firms. Given that "modern" forms of warfare (e.g., fight against guerrillas or terrorist networks) does not demand for large armed forces but new methods of military operations, some convergence between the defence and security sectors (e.g., with respect to products and customers) may be anticipated but a merger of the two sectors is not expected. The reader should keep in mind that defence expenditures are generally expected to be looser connected to terrorism than government spending on policing or intelligence. That is, it is unclear to what extent increases or decreases in defence spending actually affect the fight against terrorism (or are affected by it). Given that data (and literature) on defence spending is more available, we nevertheless report related findings and discussions, always keeping the previous remark on the (potentially) loose connection between the defence sector, defence spending and terrorism in mind.

International Peace Research Institute (SIPRI), global military spending increased by 18% between beginning of 2002 and the end of 2003, with the US, Japan, UK, France and China accounting for 64% of the world market (note that the US alone spends 47% of the global total). Yet, one may not expect this increase to last, apart from the expenditure increase in the US where defence spending has increased by over 60% in the past ten years, amongst others for the reason of combating global terrorism. Further, given new characteristics of security challenges, particularly embodied in asymmetric warfare against a clandestine enemy, military expenditure is now demanding more flexible, responsive and mobile forces. Thus, the military industry will have to adjust its products and services in order to realize this increased demand.

The security industry in contrast appears to experience sustainable growth. Available estimates put the private security industry's turnover at between US\$ 100 billion and US\$ 120 billion worldwide.⁶⁵ The largest share is accounted for by the US, although other OECD countries have sizeable security industries as well. For example, Germany's is estimated to be around US\$ 4 billion and France's and the United Kingdom's around US\$ 3 billion (Stevens 2003). There is little evidence within the industry of a major upsurge in spending on security since 9/11. However, longer-term data suggest healthy growth in turnover in the order of 7-8% p.a., easily outstripping average annual economic growth rates. Prospects for some segments, including biometrics, radio frequency identification (RFID) technologies and computer security are particularly favorable (*ibid*). But terrorism is not the sole driver of the security industry; an increasing trend in organized crime, perceptions of increased personal insecurity and the characteristics of the global economic system which make protection more necessary spur the growth of the security industry, so not all growth effects can be attributed to terrorism.

In conclusion, it appears that in the short run the military industry benefited greatly from the first reactions to 9/11 while in the long run, it will be the security industry that will profit mostly from the new insecurity environment that is posed not just by terrorism but various other forms of human induced insecurity. Other industries will continue to suffer from terror. The tourism industry is one example, as it may either suffer from terrorism as a response to increased security measures or increased (perceived) vulnerability. However, due to substitution effects (cf. Drakos and Kutun 2003) the loss of one country's tourism sector may be another country's tourism sector gain. That is, it may be meaningful to analyze the effects of terrorism on certain industry sectors from an international perspective as well.

6.3 Macro-economic impacts

Ultimately, micro-economic processes and behavior translate into macro-economic impacts which are reflected in various variables. Just as at micro-economic level, it is necessary to account for a) the direct results from increased spending in security measures, which translate into fiscal effects, and effects on aggregate consumption and investment; b) for the indirect impacts, which result from the security measures taken, reflected in e.g. increased transaction costs and repercussions on the competitiveness of the economy and c) the aggregate impacts

⁶⁵ It is necessary to point to the difficulties to measure the value added of the security industry and spending on security mainly due to data but also accounting problems, and therefore the figures are merely an attempt to provide a some dimensions of this still somewhat elusive sector.

of changes in consumption and investment spending which do not result from direct security investments but rather from risk aversion.

6.3.1 Fiscal effects

In theory, a negative shock such as a terrorist event is expected to incur an increase in public security spending (Brück 2006), with the potential effect of retarding long-term growth as high budgets for defence and homeland security may crowd out more growth-enhancing investments; moreover, there is some evidence that public security spending may also crowd out potentially more efficient private sector attempts to increase security. In fact, Stevens (2003) finds that governments and other public authorities have increased their overall spending on security, in some cases quite substantially. The US Homeland Security budget doubled from fiscal year 2002/03 to its current level (2004) of well over US\$ 30 billion: funding for aviation security is now running at US\$ 4.8 billion and for border security at US\$ 10.6 billion. Stevens (2003) concludes that such investments are funded by government taxes or private spending. Consequently, even if this will not incur significant budgetary impacts, economic impacts will still be significant.

Gupta et al. (2004) who analyze the changes in composition of public spending in low and middle income countries show that terror and armed conflict may lead to increases in defence spending, resulting in a negative impact of public spending on social and economic issues. Thus, they show that the fiscal effects of defence and security spending in medium and low-income countries can have a significantly negative fiscal impact, consequently reducing future economic growth.

6.3.2 Growth

Related to the fiscal impacts of security spending but more complex is the relation between security spending and growth. A large body of literature exists discussing the effects of defence expenditures on economic growth (Ram 1995; Cohen et al. 2003; Lee and Chang 2006) and analyzing potential spill-over effects of defence R&D for the economy (Lerner 1992; Cowan 1995; Lichtenberg 1995; Trajtenberg 2004). Yet, this literature does not identify a straightforward relation between the defence expenditures and growth. Various studies show that the defence-growth relationships can take many forms: defence spending can have a lagged effect on growth. It may even spur growth in the short run, while constraining it in the long run, or vice versa. Rather than directly, defence spending may influence the economy through indirect channels. In fact, the causality may even be reversed, so economic development may also influence defence spending. Cohen et al. (2003) provide a more nuanced analysis differentiating between short- and long-term effects, and between direct and indirect impacts, thus providing a more cautious conclusion about both the impacts of defence expenditure on the one hand, as well as the impacts of the so called “peace dividend”.⁶⁶

In contrast to the extensive literature on defence-growth relationships outlined above, hardly any literature exists on the impacts that terror security spending will have on economic growth. Baily (2001) concludes that (provided fiscal discipline prevails) there is no reason to

⁶⁶ The peace dividend refers to a shift of government expenditure away from defence spending into economically productive sectors (or into welfare programs, tax cuts etc.).

fear that long-run growth is compromised for higher security. Rather than expecting negative effects from increased security spending, he alludes to the potential negative effects of a reversal of the current state of liberalization. Baily's argument accords to Hobijn's (2003) assertion that neither private nor public security spending will have a major impact on the US economy, estimating that private security spending will reduce labor productivity by only 1.12% and multifactor productivity by only 0.65%, resulting in only small aggregate results on US GDP. Regarding public security spending, he calculates that homeland security spending will reduce output only by 0.6 % over a five-year period. Judging by the much larger scale of military spending in the 1980s, he believes that to be negligible, also having no effect on the US budget deficit. Lenain et al. (2002) estimate that security spending leads to a reduction in real GDP by about 0.7 % after five years.

However, these results are thought to be too optimistic (Brück 2006). In addition, they were made shortly after the 9/11 attacks when the full extent of counter-terrorism measures could not be known. Therefore, it is necessary to treat these conclusions with caution. Furthermore, these estimates only refer to security spending in the US, i.e., a large and well-developed economy with an annual GDP of over US\$ 13 trillion. It is possible that security spending could have a significantly retarding effect on economic growth in small and less developed economies (Gupta et al. 2004).

6.3.3 Trade

The literature pays specific attention to the negative impacts of slowed down transport and trade flows due to heightened security measures at borders and transport hubs (Brück 2006). These "frictional costs" of trade arise not only from delays at transport hubs and border controls but also from increased insurance charges and prices for security measures which are passed on from operators to clients (e.g., Nitsch and Schumacher 2004). In quantitative terms it has been estimated that a one-day delay due to border controls costs 0.5% of the value of the delayed good (Hummels 2002). Leonard (2001) estimates rising trading costs of 1% to 3% ad valorem after 9/11.⁶⁷ This increase corresponds to an annual increase in production costs of traded goods of US\$ 5.6 billion to US\$ 16.8 billion (Walkenhorst and Dihel 2002). Ultimately, with an estimated elasticity of trade flows (in volume terms) with respect to transport costs (ad valorem) of -2 to -3.5, Limao and Venables (2001) expect trade to reduce by this factor.⁶⁸ It is necessary to note that these impacts on trading costs and subsequently trading volumes will vary across goods as well as across trading countries: goods with a high value to weight ratio whose share of trading costs already before 9/11 had a lower proportion of the value (e.g., pharmaceuticals) are expected to be less affected than goods with a low value to weight ratio (Walkenhorst and Dihel 2002).

In 2001/2002, when these studies were implemented, authors such as Walkenhorst and Dihel (2002) expected security measures to abate over time, with an enhanced perception of security

⁶⁷ Prior to 9/11, estimates of the cost of time delays, paperwork and compliance related to border crossing ranged from 5 to 13% of the value of the goods traded.

⁶⁸ As pointed out before, these figures were calculated shortly after 9/11 and are not based on empirical evidence but rather on crude estimations and assumptions. They are provided as more recent and accurate figures do not exist and to show the possible effects, even if they are merely hypothesised.

in the transport and trade sector, yet, given continued attempts to attack infrastructure, costs in fact are likely to have increased.

Yet, not all studies see increased investments in security necessarily in a negative light. For example, Mirza and Verdier (2008) point to the two-way relationship between terrorism and trade openness, which implies that the relative costs and benefits of openness in relation to terrorism⁶⁹ have to be carefully assessed against the costs of enhanced security measures.

6.3.4 Investment

Macro-economic impacts of security measures may also result from changes in investment behavior due to increased risk aversion. Ryans and Shanklin (1980) in their study of 82 executives of leading multinationals in the US show that a firm's decision to expose itself to the risk of terrorism in a host country will be determined by the returns on the investment, which must be considerably greater than under normal conditions. Thus, high returns on investment are likely to be the reason for Purnell and Wainstein's (1981) finding that despite potential difficulties businesses will not pull out of a country but rather cope with terrorist threats or attacks as with other acts of violence.⁷⁰

Yet, in contrast to the relative manageability of terrorism that these micro-analyses suggest, aggregate studies are more pessimistic about the relation between terrorism and capital flows. For Spain and Greece Enders and Sandler (1996) find that protracted political insecurity through terrorism will have significant negative impacts on foreign investment inflows. Capital inflows to Spain decreased by 13.5% on average over the period 1968 to 1991; Greece which was plagued by two major terrorist organizations in the same time period, experienced a comparable reduction of direct foreign investment averaging 11.9% annually.⁷¹

At a cross-country level, Blomberg and Mody (2005) estimate the quantitative implications of violence on international investment. Three findings emerge from their analysis: firstly, violence at home tends to move investment abroad; secondly, violence in the host country deters both trade and FDI flows, where such an effect is particularly strong in developing countries; thirdly, WTO membership appears to counter the negative impacts on bilateral FDI flows, which suggests that while violence raises political risk and discourages investment flows, WTO membership signals a commitment to lower country risk.

As stated above, irrespective of more positive opinions at the micro-economic level, the literature on aggregate effects shows that transnational capital flows are adversely affected by measures adopted to avoid the risk of terrorism.

⁶⁹ Such assessment should not only focus on benefits to counter terrorism but should incorporate an analysis to what extent security measures against terrorism could enhance overall system security against a variety of vulnerabilities.

⁷⁰ This is consistent with empirical findings of, e.g., industrial economies which shows that economic variables (linkages into the global market economy, available technological capabilities, etc) are more important than geopolitical factors.

⁷¹ For Spain, this translates into a decline in real direct foreign investment of almost 500 million dollars, or 7.6% of annual gross fixed capital formation. For Greece, this means a loss amounting to almost 400 million dollars, or 34.8% of annual gross fixed capital formation.

6.4 Political effects of counter-terrorism measures

As in one subsection of Section 4, we also want to briefly allude to the political effects of counter-terrorism policies. Clearly, a detailed discussion of the repercussions of anti-terrorism measures on civil liberties and democratic rights surpasses the scope of this report which focuses on the economic impacts. However, e.g., as Tavares (2004) finds a positive relationship between the resilience of economies and democratic rights, the potential negative repercussions of anti-terrorism measures on democratic freedoms warrant at least a short mentioning; its impact on the resilience of economies could be a further field of study.

Goderis and Versteeg (2008) find that as a reaction to terrorist threats after 9/11 human rights violations (e.g., in the form of torture and political imprisonment) by US allies have increased systematically. While some institutional constraints (e.g., in the form of an independent judiciary) may reduce such negative effects, the findings nevertheless imply that in times of crisis a trade-off between security (in whose name human rights are constrained) and liberty exists, where the magnitude of such a trade-off depends on the institutional setting of affected countries. On the international level, related changes in the allocation of aid to developing countries have also been made. New practices such as increases in aid for military expenditure (in the name of counter-terrorism) are criticized to run counter development objectives and international commitments to human rights (Tujan et al. 2004; Beall et al. 2006).

Thus, it is no surprise that Dreher et al. (2007) find that terrorism exercises a negative impact on governments' respect for human rights. That is, the likelihood of human rights violations (e.g., torture, extrajudicial killings) increases in the face of terrorist threats. Even some civil liberties may be constrained in consequence, although the study finds no systematic effect of terror on political participation and other freedoms associated with a liberal political system. Again, the findings are dependent on country-specific characteristics, where governments with initially high respect for human rights are most likely to curtail them.

Apart from the impacts of security measures on citizens' rights in terror target countries, the impacts of aggressive counter-terrorism measures in terror host countries have been found to terrorize innocent citizens (Kivimaeki 2003).

In general, preliminary results indicate that security measures to counter terrorism are linked to political costs which may (in a country-dependent and internationalized sense) manifest in a "terrorization" of terror-affected populations. In the name of security, governments appear to be willing to sacrifice certain human rights and related liberties. Ironically, such a trade-off implies that terrorists are successful in reaching one of their central goals (political destabilization) also through counter-terrorism actions of attacked governments. Existing evidence also points at the importance of institutional settings of affected countries for assessing the 'true' (indirect) political costs of terrorist activity that come along with counter-terrorism measures. As one direction of future research, analyses of the economic repercussions (in the form of monetary and welfare losses) probably linked to related policy measures should be furthered.

6.5 The determinants of the economic impacts of anti-terrorism policy

In conclusion, while acts of terrorism have only temporary effects on a mature economy, this section has shown that counter-terrorism measures may potentially extend the impacts of terrorism throughout the economy. Compared to the direct impacts of a terror attack, related determinants and outcomes are much more diffuse and more difficult to anticipate and capture. Even though empirical proof is scant, the available literature points to the following factors which at least in theory determine the economic repercussions of security measures: (i) the choice of security measures that are adopted, (ii) how and by whom security is provided, (iii) the economic context in which security measures are implemented and (iv) the effects security measures have on future terrorist attacks.

As shown in this section, the economic effects of security measures are *inter alia* determined by the actual type of measure adopted by various economic agents. These measures do not only determine the actual overhead investment or financial outlay necessary but also the scope to create synergies between different security measures. Further, the respective security measures will influence the indirect impacts on the economy through, e.g., impacts on transaction costs and externalities.

Actual security measures adopted by economic agents are influenced by the perception of the actual level of insecurity and the underlying threats; in the case of public agents, political considerations also matter, e.g. by choosing means to retain the confidence of their constituencies and to demonstrate power towards perpetrators (Enders and Sandler 2006). Thus, especially at government level the appropriate form to reinstall security (actual and perceived) is often seen to lie in aggressive action. Considerations of economic impacts (often in the distant future and thus not easy to calculate) therefore appear to be mostly left out of policy considerations.

As importantly, actual security measures as well as the costs of these measures are determined by the expected behavior of other actors. Especially in the case of transnational terrorism, cooperation between countries is essential to maximize the cost effectiveness of counter-terrorism measures. Non-cooperation does not only imply that a few actors have to bear the costs of the measures, but also, given inter-dependent security, that the measures are unlikely to be effective, which in turn creates disincentives to invest in certain policies.

Security can be provided more or less economically efficiently. As the case of airport security shows, one major question that has not been answered so far is whether governments or the private sector are more effective in providing maximum security at minimal costs. Related to this, in theory, economic repercussions will further differ depending on the mechanisms and approaches (e.g., market mechanisms versus regulations) that are employed to induce security provision. Brück (2006) models the implications of security spending, which could be voluntary, in response to market forces, or forced spending due to new security regulations and legislation: While the first scenario (voluntary security spending) is akin to an insurance spending, the second (responses to market forces) may result in higher costs, yet at the same time could prevent or even raise revenues, while the third (regulated security spending) is congruent to an environmental regulation, increasing social welfare, at the expense of producers with the effect of an overall decrease in the industry's productivity.

Lastly, the ability to coordinate security measures across economic agents not only within but also between economies is likely to impact economic repercussions in two ways. Firstly, given the inter-dependence of security and insecurity, a failure to coordinate measures yielding all links of a system may render individual security investments impotent, therefore rendering no or negative returns to the investment; secondly, given potential negative impacts of competitiveness on involved economic sectors, the economic repercussions of security provision will also be determined by the ability to coordinate security measures across competitors in different economies.

Even though little information is available, Gupta et al. (2004) suggest that security spending may have different effects on economies with different sizes, e.g. as a certain level of security spending implies a higher share in overall spending in a smaller than in a larger economy. However, as the *Australian Department of Foreign Affairs and Trade* DFAT (2004) argues, especially for developing economies spending on security measures can imply an investment into investor confidence and therefore boost economic development. Hypothetically, basic investments to enhance security could positively influence a smaller “less secure” economy up to a certain level, increasing its resilience as well as confidence of economic players in it. This effect could level off, the more developed the economy is, while in fact, reverse, i.e. create negative repercussions in highly developed and open economies due to negative impacts on economic efficiency. This, however, is a hypothesis and the actual dynamics between security and economic development require more careful research.

Related to this, wherever investments in security technologies are necessary, the economic impacts will differ depending on whether an economy is a net importer or exporter of these technologies. If an economy’s security sector is sufficiently large and competitive, this sector and the aggregate economy are likely to gain from increased investments in security. Yet, countries which do not produce necessary security technologies will need to import these goods and services. Thus, economic effects of security spending will partly be determined by whether a country is a net importer or exporter of security technologies and services. Long-run costs of security measures will be determined by their actual impact on terrorist behavior. In the best case scenario, security policies will be effective and acts of terrorism will cease; however, in the worst case scenario, terrorists will adjust their behavior to undermine security measures which may result in more severe actions and thus increased costs from terror activity. As Enders and Sandler (2006) show, these considerations are not merely theoretical but reality; however, these costs are often not incorporated into cost-benefit analysis of policy measures.

7 AN EUROPEAN PERSPECTIVE ON THE ECONOMICS OF INSECURITY

In this section, we want to re-evaluate our previous discussion, putting a special European (or EU) perspective on the issue of terrorism. That is, we want to (i) give an overview of historic and current trends in terrorist activity in Europe to assess actual threat levels; (ii) have a look at the causes of terrorism in Europe, acknowledging that the roots of terrorism may differ

from one part of the world to the other; (iii) inspect the economic and political costs of terrorism; (iv) evaluate counter-terrorism efforts in Europe (with a special emphasis on EU strategies) and their potential interactions with terrorist activity. Avoiding unnecessary repetitions, we use previously discussed academic theory and evidence; as Europe-specific evidence on the issue of terrorism is generally sparse, some of our appraisals are rather based on the transfer of knowledge on terrorism in other parts of the world (e.g. with respect to its causes and effects) to the European theater. Given the importance of the European Union as a supranational organization, we will discuss its role in combating terrorism in particular.⁷²

7.1 Trends of terrorism in Europe

The TWEED dataset by Engene (2007) provides a good overview of the dynamics of domestic terrorism in many European countries from 1950-2004. During this period, France, the United Kingdom, Spain, Italy, Germany and Greece were most hit by internal terrorism, considering a simple count of events. In fact, almost all (ca. 98%) of all internal terrorist acts during the period of observations were conducted in these countries. With respect to the ferocity of domestic terrorism according to TWEED, during 1950-2004 over 2900 individuals were killed through domestic terrorism. Again, over 2800 individuals were killed in the six countries most affected by terrorism mentioned above. Domestic terrorist activity was more common in the 1970s and 1980s and these decades were also the most brutal ones. Nevertheless, internal domestic terrorist activity never ceased during 1950-2004. Most terrorist acts (about 80%) were committed by organizations with ethnic-nationalist ideologies, prominent groups being the ETA in Spain and the IRA in the United Kingdom. Other groups (e.g., the RAF in Germany or the Action Directe in France) were driven by non-nationalist (left-wing) ideologies (Engene 2007). While left-wing terrorism seems to be on decline since the end of the Cold War, domestic terrorism from ethnic-nationalist groups remains a substantial threat. Furthermore, European countries may increasingly face new forms of home-grown terrorism, drawn from a pool of a radicalized youth incited by new globalized (al-Qaeda-styled) terrorist networks and their propaganda (Heller 2009).

European countries have not only been constantly plagued by internal terrorism but also by transnational one. Gaibullov and Sandler (2008) use data from the ITERATE dataset and show that the top-six countries that suffered from transnational terrorism in the past were again France, the United Kingdom, Spain, Italy, Germany and Greece. Transnational terrorism in Europe was more prominent in the 1990s than domestic terrorism, while internal terrorism accounted for most of the overall terrorist activity in the 1970s and 1980s, and also after the year 2000. This matches with the more general perception that domestic terrorism is a more common phenomenon than transnational terrorism.⁷³ Regarding transnational terrorist groups ideology, in the past were driven by nationalist motifs (e.g., the PLO). However, (as

⁷² Delpech (2002) and Heller (2009) provide first overview of the issue of terrorism with a special emphasis on the European (EU) perspective towards it.

⁷³ However, the TWEED and INTERATE data sets do not necessarily measure distinct forms of terrorism. For instance, the TWEED set counts terrorism by the IRA in Great Britain as domestic terrorism, while ITERATE counts this form of terrorism as transnational (as Northern Ireland is not part of Great Britain). Technically, this leaves open the possibility that trends derived from these two datasets are to some extent driven by double counting problems (as similarly discussed in Section 2).

with internal terrorism) new forms of radicalization in Europe may create a new (religiously motivated) wave of terrorism directed at an international audience (Heller 2009).

Overall, Europe has been ridden by both domestic and transnational terrorism, with the relative importance of these two kinds of terrorism shifting over time. Here, some countries have faced the most attacks in total numbers and with respect to their ferocity. While in the past many organizations were incited by nationalist goals, currently a new wave of terrorism may develop associated with the radicalization and globalization of religiously motivated networks.⁷⁴

7.2 Causes of terrorism in Europe

7.2.1 Domestic terrorism

As hinted at time and again, the lack of data on domestic terrorism has made an analysis of this specific kind of terrorism impossible. For Europe the development of the TWEED dataset by Engene (2007) allows to overcome these data issues. Given that the dataset is relatively young, only few studies have actually used in to conduct empirical analyses of terrorism causes similar to the ones extensively presented in Section 3 of this contribution. Furthermore, Sanchez (2009) employs a new and unique datasets.

Krieger and Meierrieks (2009) make use of the TWEED dataset and find that social welfare policies exercise a significantly negative effect on the genesis of domestic terrorism, resembling the findings of Burgoon (2006) for transnational terrorism. Their analysis also finds that larger populations are positively associated with domestic terrorism production. Overall, these findings suggest that economic factors (moderated through social policies) matter to domestic terrorism in Europe. The findings of Krieger and Meierrieks (2009) also stress the importance of “good” institutions (in the form of sound welfare systems) in decreasing terrorism risk, possibly be leveling social discontent associated with economic disparities.

Similarly, Gries et al. (2009) who also build on the TWEED dataset find that economic growth is negatively related to terrorism production. In fact, the findings of Gries et al. (2009) provide causality evidence that economic performance leads (Granger-causes) domestic terrorism but not vice versa.⁷⁵ Again, this stresses the relative importance of economic factors in explaining domestic terrorism in Europe. In a theoretical sense, the results of these two studies imply that economic deprivation (or the lack or leveling thereof) are associated with the genesis of domestic terrorism in Europe.

Using a unique dataset, the analysis by Sanchez (2009) finds that revolutionary (i.e., left-wing) terrorism in Western Europe has been also driven by the experience of past dictator-

⁷⁴ See also the annual terrorism reports by Europol (e.g., Europol 2008). These reports similarly distinguish between religious (Islamic), left-wing, right-wing and ethnic-nationalist terrorism. They also introduce the single issue (e.g., environmental) terrorism as another form of terrorism.

⁷⁵ Note that Gries et al. (2009) directly investigate the issue of causation between economic conditions and terrorism, which implicitly follows from our review: While in Section 3 reviewed studies, inter alia, viewed economic conditions as a cause of terrorism, reviewed studies in Section 4 considered terrorism as a determinant of economic development. Given that Gries et al. (2009) focus only on few countries, we do not want to infer a general finding neglecting the impact of terrorism on the economy. However, their study surely hints at a promising field of future research.

ships (e.g., in Germany, Greece and Italy), where Sanchez (200) argues that this relationship may, e.g., be associated with past repression exerted by these very dictatorships and their effect on terrorist mobilization. He also finds that strong Communist parties matter to the genesis of terrorism, while economic factors do not matter strongly.⁷⁶

The aforementioned studies are the only ones available which analyze the determinants of domestic terrorism in Europe in a way comparable to the analyses presented in Section 3. Surely, the availability of TWEED will lead to more research on this area in the near future. Currently, we may assess that, first, economic success seems to matter insofar as it is distributed by means of functioning social policies. Second, political change and instability may have to do with terrorist activity during transition periods in Spain, Portugal or Greece, but also with (left-wing) terrorist activity in further countries with an authoritarian past. Here, terrorist organizations may find it cost-efficient to use violence against weak states to achieve political targets.

Beside these factors, we may also speculate about further determinants of domestic terrorism in Europe, where future research on these factors is advocated. First, it seems reasonable to assume that ethnic factors also matter. Identity-related conflict in Spain, France or United Kingdom may have influenced the calculus of individuals in these regions and may have filled the ranks of violent organizations in these countries. However, there are parts of Europe where ethnic conflict abounds (e.g., Catalonia) without strong terrorist activity. That is, ethnic conflict may have contributed to the escalation of violence but may not be its (only) root cause. Second, the Cold War antagonism may have given rise to left-wing terrorist groups in Western Europe. For instance, such organizations may have built on the (ideological and financial) support of Eastern governments. The end of the Cold War has consequently led to a decline in left-wing terrorist violence. However, while it seems reasonable to assume that ethnic factors and Cold War dynamics (along other factors) may explain the patterns of domestic terrorism in Europe, no study exists which analyzes these relationships empirically in an economic way.

7.2.2 Transnational terrorism

As with domestic terrorism, there are few studies explicitly which analyze the determinants of transnational terrorism in Europe. However, we can draw on previously presented evidence to make several assumptions about transnational terrorism dynamics in Europe. As Bird et al. (2008) note, Europe has been one of the parts of the world most strongly targeted by transnational terrorism. However, Europe is not a region that predominantly produces transnational terrorism. Thus, we will in the following focus on the causes of Europe importing transnational terrorism.

Bird et al. (2008) argue that rich democracies are likely targets of transnational terrorism. On the one hand, they are likely to be targeted by individuals or organizations from poor economies, implying that the global distribution of income motivates terrorist attacks. On the other hand, democracies are targeted because they are the regimes which will most likely react to

⁷⁶ The notion that economic factors (i.e., the economic deprivation hypothesis) is not particularly valid for Western Europe is also supported by Thompson (1989) who provides time-series evidence for Northern Ireland and does not find that terrorism is rooted in poor economic conditions (e.g., chronic unemployment).

terrorist actions. Following this line of argumentation, Europe is targeted by transnational terrorism because of its economic success and relative political openness.

Following Dreher and Gassebner (2008), countries are likelier targets of terrorism when they are politically close to the United States. Undoubtedly, this is the case for Europe and the EU. The US and its allies are targeted because of foreign policy considerations, e.g., support for Israel or military interventions in Iraq and Afghanistan. In an economic sense, terrorist groups find it more cost-efficient to recruit and muster support when they can build on grievances associated with the existing global order dominated by Western interests. In fact, the evidence by Barros et al. (2007) suggests that US citizens are targeted in particular by left-wing and radical Islamic groups in Europe. These groups are the ones most likely incited by anti-systemic resentment. At the same time, terrorist groups may target European countries when these countries are allied to the terrorist groups' main enemy (e.g., the government of the terrorists' group home country). This strategic logic matches the theoretical model by Addison and Murshed (2006) where terrorists export violence by attacking the friends of their enemies, thereby trying to produce media attention and undermine support for their main antagonist.

As Heller (2009) notes other factors may also determine transnational terrorist activity in Europe, especially in the context of home-grown terrorism directed at an international audience. Here, a lack of education and of social inclusion (social integration) may be named as determinants of terrorism. Here, institutional constraints may make it easier for terrorist groups to recruit new members when building on feelings of alienation and marginalization.

In short, while there is no evidence explicitly analyzing the determinant of transnational terrorist attacks in Europe, we may from existing (global) evidence conclude that European countries are targeted because of their economic success, their political openness and their closeness to the US and its general foreign policy. Other institutional factors which may constrain the lives of certain individuals (e.g. with immigration or minority backgrounds) create grievances within certain segments of a society and contribute to the radicalization of such groups.

7.3 Consequences of terrorism in Europe

7.3.1 Economic effects

As Europe has been attacked by domestic and transnational terrorist groups over the past decades, negative economic effects are anticipated. Again, the second-order (indirect) effects of terrorist strikes are more likely to reduce terrorist activity than the first-order (direct) ones.

First, several studies detect negative effects of terrorist strikes on the tourism sector, particular analyzing the impact of terrorism on tourism in countries that are strongly dependent upon income streams from tourism (e.g., Enders and Sandler 1991; Enders et al. 1992; Drakos and Kutan 2003). For instance, Enders et al. (1992) find that terrorist activity in Greece, Italy and Austria has led to substantial economic losses for these countries in the 1970s and 1980s. Mostly, these losses stem from changes in consumer behavior (i.e. in traveling) resulting from terrorist activity. As the risk of terrorism in a country increases, it generally becomes more attractive for individuals to travel to more safe countries (cf. Drakos und Kutan 2003).

Enders and Sandler (1996) also document a negative effect of terrorism on economic integration, namely on foreign direct investment (FDI). This study shows that Greece and Spain suffered from terrorism in the form of substantial losses in foreign direct investment (over 10% per year). While terrorist strikes may directly damage FDI-related property, the indirect effect of terrorism is anticipated to be much stronger. Potential investors weigh the risk of investment against its future profits. Clearly, terrorism increases the risks of investment and thereby makes it more likely that FDI is diverted. As Enders and Sandler (1996) note, this effect may be stronger for smaller countries because they are less able to diversify risk and attract FDI from many different countries. In any case, the findings of Enders and Sandler (1996) demonstrate that terrorism may have a negative impact on economic integration.

Terrorism needs not only to affect certain business sectors or economic integration in Europe. As Fielding (2003) for Northern Ireland shows, terrorist conflict may have large scale impacts on economic activity in general. He demonstrates that terrorism discourages investment, production and employment. Again, these effects are a likely consequence of entrepreneurs responding to the uninsurable risks associated with terrorism, so they are effects of the second order. Similarly, Greenbaum et al. (2007) for Italy show that terrorism has a destabilizing impact on business activity. Terrorist activity is found to reduce business formation and expansion, and employment. Evidently, entrepreneurs react to the risk of terrorism.

Given that terrorism in Europe appears to have negative impacts on certain business sectors in particular but also on production and employment in general, we may anticipate that terrorism reduces overall economic growth. In fact, Gaibulloev and Sandler (2008) find that terrorist activity has reduced economic growth substantially between 1971 and 2004. It is argued that domestic terrorism led to an increase in government spending (crowding out private investment in consequence), whereas transnational terrorism causes a direct crowding out of investment, without noticeable effects on government spending. However, Enders and Sandler (2008) argue that negative shocks stemming from terrorist activity are absorbed effectively by economies that exhibit good institutions and diversified markets, so growth is not impaired by terrorism. While it appears to be intuitive that terrorism affects certain sectors of an economy, it is thus unclear whether these effects feed through to overall growth. In fact, Gries et al. (2009) offer time-series evidence that demonstrates that growth has not been substantially impaired by terrorism, giving support to the reasoning by Enders and Sandler (2008). However, terrorism may damage overall economic growth on regional levels, e.g. in the Basque country (Abadie and Gardeazabal 2003). Negative effects on regional levels do not need to show up on aggregate (national) levels.

7.3.2 Political and social effects

We also want to briefly discuss the more broad effects of terrorism on affected countries, especially in the political and social realm.

One central goal of terrorism is political destabilization. Such effects may also be detectable for the European theatre, even if affected polities are usually characterized as stable. Indridason (2008) shows that terrorist activity indeed influences domestic politics by affecting government formation. In times of terrorism, governments are formed that exhibit lower degrees of ideological polarization and that build on larger parliamentary majorities. Such an effect may be interpreted as a counter-reaction to the terrorist threat of political destabiliza-

tion. Nevertheless, it shows that political effects are noticeable even in Europe. In a more extreme scenario, Gassebner et al. (2008) argue that terrorism threatens government survival as the electorate punishes failures to counter terrorism. Here, the Madrid train bombings of March 11, 2004 may serve as an example that such mechanisms also work in Europe. Timed immediately before the Spain general elections, the terrorist attacks negatively affected government survival, leading to the political success of the opposition party.

On a final note, it has been argued that terrorism not only produces economic and political but also broader societal costs, e.g., measurable in terms of life satisfaction (Frey et al. 2009). For France, the United Kingdom and Ireland (as three European countries strongly affected by terrorism) Frey et al. (2009) show that terrorism has large negative effects on life satisfaction. The non-monetary losses in life satisfaction indeed translate into considerable monetary effects once converted. This finding may demonstrate that is not sufficient to look at economic losses (in terms of employment, investment etc.) but to also consider more holistic indicators (e.g., life satisfaction) which measure the impact of terrorism on the well-beings of individuals and their behavior.

7.4 Counter-terrorism policies in Europe

7.4.1 Policy actions

As we have argued before, governments may act against terrorism in defensive and proactive ways. All related strategies aim at influencing the costs, benefits and opportunity costs in ways that reduce the incentives for terrorist activity. On a supranational level, the EU has undertaken a number of policy actions in order to influence terrorist activity accordingly.⁷⁷

One set of coordinated policies of the EU aims at reducing terrorism within its borders. The EU has set up an action plan of combating terrorism, as critically reviewed by Bossong (2008). Related coordinated policy actions include, inter alia, an increased protection of borders and critical infrastructure (Heller 2009), international intelligence cooperation (Müller-Wille 2009), actions against terrorism financing and money laundering (De Vries 2005) and an adjustment of EU foreign policy so as to provide assistance and coordination in the fight against terrorism on a global scale (De Vries 2005; Keohane 2008). In a theoretical sense, actions against terrorism financing and changes in intelligence and foreign policy aim at increasing the costs of terrorism, e.g. as the risk of terrorist organizations to be exposed increases. An increased protection of borders and infrastructure may simultaneously increase terrorism costs and lower its benefits. Many of these counter-terrorism policies are directed against internationalized forms of terrorism. It is less likely that such actions are especially helpful in combating domestic terrorism, although this kind of terrorism still is a considerable threat to several EU member countries (e.g., Spain and Greece).

Another way of fighting terrorism is to target the roots of terrorism, thereby influencing its opportunity costs in ways that reduce violence. Previously, we argued that Europe is targeted

⁷⁷ The counter-terrorism efforts by the EU have been developed in recent years, in particular after the events of September 11, 2001. They are, of course, matched by counter-terrorism efforts by member countries (e.g., efforts by the Spanish government against ETA, as analyzed by Barros (2003). For this review, we will mainly focus on EU actions.

by transnational terrorism because of its economic success, political openness and foreign policy. Clearly, it is neither possible nor desirable to give up wealth or democracy for security, or to let terrorist groups influence European foreign policy. In this respect, EU policies that aim at increasing the costs of terrorism or to reduce its benefits appear reasonable to fight terrorism. Nevertheless, related policy strategies have been criticized (cf., Bossong 2008).

Fighting domestic terrorism by soft strategies appears to be more helpful. Existing evidence indicates that economic success and sound welfare policies discourage domestic terrorism within EU borders, thus suggesting that successful economic and social policies may yield an additional terrorist peace dividend. At the same time, political participation for fringe group (e.g., ethnic minorities) may be helpful to manage conflicts along ethnic or nationalist lines in peaceful ways. Barros (2003) argues similarly for the case of ETA in Spain, showing that hard political actions against minorities (e.g., banning parties representing the Basques while being potentially affiliated with ETA) may backfire.

7.4.2 Effects of counter-terrorism policies

Policy actions against various forms of terrorism which have already been undertaken or which may (given the evidence) be implemented in the future may produce a variety of effects (costs). Potentially, there are economic costs. Counter-terrorism efforts divert public spending away from potentially more effective projects towards security. Potentially, such security measures are neither effective nor (economically) cost-efficient (Heller 2009). For instance, security measures at borders, ports and airports produce economic costs (transportation costs) which may distort economic activity, while not being particularly effective security means at the same time. Clearly, security measures which aim at increasing the costs of terrorism also increase the economic costs of other agents, thereby producing non-desirable second-order effects of terrorism.⁷⁸

With respect to the supranational counter-terrorism strategies of the EU, some undesirable effects are worth noting that are not purely economic. First, counter-terrorism strategies like intelligence cooperation, information exchange or migration control may endanger civil liberties and democratic standards and principles with the EU (e.g., Den Boer et al. 2008; Balzaq 2008). Guild (2008) explicitly discusses the issue of “terrorist lists” to show that there is an inherent conflict between security needs which lead to coordinated security means and individual rights. Similarly, intelligence cooperation and information exchange endanger the (democratic) foundations of the EU when such issues are not subject to political or judicial scrutiny in sufficient ways. In this respect, the second-order political effects of terrorism on EU level may very well contribute to erosion of democracy which may, ironically, potentially be a goal of terrorist attacks.

Second, counter-terrorism strategies may lead to changes in foreign policy. Joffe (2008) notes that EU countries cooperate with North African countries mainly in order to combat transnational terrorism (the share threat of the EU and North Africa). Basically, Joffe (2008) criticizes that security concerns of the EU have replaced the European agenda to promote economic and political development in its neighborhood. Consequently, security considerations trump over efforts to foster democracy and human rights protection in adjacent parts of the

⁷⁸ We have discussed a variety of these effects earlier, so we will not repeat this discussion here.

world. Another second-order effect of terrorism in Europe is thus a change in foreign policy which may yield short-run benefits (e.g., improved migration control or intelligence cooperation). However, by essentially backing non-democratic regions in exchange for security, the European strategy may contribute to the production of more grievances and thus transnational terrorism in adjacent parts of the world (e.g., given that empirical evidence indicates that repression may be one root cause of transnational terrorism).

Third, counter-terrorism efforts by European governments may lead to transference and substitution effects. On the one hand, increases in internal security in the EU may lead to a transfer of terrorist activity to countries that are less capable of defending themselves against terrorism. However, transference of terrorism to other parts of the world does not imply that the EU (or the US) is safer. By contrast, the transfer of terrorist activity may mean that terrorist attack European (and American) citizens more strongly abroad instead of attacking them in their home countries (cf. Enders and Sandler 2006).

Similarly, counter-terrorism efforts by the EU may also induce a change in the tactics of terrorists. As Jackson et al. (2007) show, terrorist groups are capable of adapting to counter-terrorism measures, e.g., by using different kinds of weapons or organization. For instance, a tightened airport control may simply result in an increased vulnerability of other parts of the transportation system, making attacks on public buses or trains more likely.

Given that counter-terrorism efforts may produce a number of economic and political effects and may even significantly influence terrorist behavior, future research should surely focus on this are in particular.

7.5 Summary

Europe has been targeted by domestic and transnational terrorist groups, with the relative importance of these two kinds of terrorism shifting over time. While in the past many organizations were incited by nationalist or left-wing goals, currently a new wave of terrorism may develop associated with the radicalization and globalization of religiously motivated networks. There is little systematic evidence on the causes of domestic and transnational terrorist activity in Europe. Some evidence links domestic terrorist activity to economic decline and poor institutions. However, other factors are also anticipated to matter (e.g. ethnicity, history). Some factors which may constrain the lives of certain individuals (e.g. with immigration or minority backgrounds) create grievances within certain segments of a society and contribute to the radicalization of such groups, thus potentially providing the breeding ground for new (radicalized or religious) terrorist activity in Europe. At the same time, Europe has been targeted by internationalized terrorism. Here, one may suggest that these attacks are driven by European economic success, its political openness and closeness to the US (i.e., to European foreign policy).

Terrorism in Europe has negatively impacted certain business sectors (e.g. the tourism industry), also affecting production, employment and overall economic growth. However, it is disputed whether economic shocks from terrorism produce long-run costs for countries that exhibit good institutions and diversified markets (as the EU countries) on national levels. Rather, it is more likely that terrorism damages economic activity in regions (at the sub-

national level) most hit by terrorism. Still, the political and social costs of terrorism must not be underestimated, e.g. in terms of losses in life satisfaction.

Counter-terrorism efforts have (besides activity in national levels) been coordinated by the EU as a supranational organization. This counter-terrorism activity aims largely at increasing the costs of terrorism (e.g. by aggravating money laundering). Even as appeasement towards domestic and transnational terrorists does not seem to be an option (as this would mean e.g. giving up territory or changing foreign policy), the counter-terrorism efforts of the EU have been criticized. On the one hand, they produce negative (second-order) effects on the economy. On the other hand, they may endanger civil liberties and democratic standards within the EU or may lead to unfavorable biases in the EU's foreign policy. One may argue that such negative (second-order) effects of counter-terrorism and security efforts on the economy, and internal and external politics may produce new terrorism in Europe and abroad that is directed at the EU) or may make such a production at least more likely.

8 CONCLUSION AND RECOMMENDATIONS

Our analysis of the existing literature provides a number of insights regarding the direct and indirect impacts of terrorism on the economy. Hence, our survey shows the importance to differentiate between the direct impacts of terrorist attacks, the indirect impacts which arise from response reactions of economic agents, consumers, producers and the public sector and the longer term adaptation of terrorist groups to a new security environment. The direct economic impacts of terror attacks appear to be determined by the nature and scale of the actual attack, the structure and functioning of the economic system and the behavior of economic agents to mitigate the impacts of terror.

While much of the literature concentrates on the direct impacts of terror attacks, the analysis reiterates the argument of Chen and Siems (2004) and Brück (2006) that impacts resulting from security responses of economic agents could incur more significant economic repercussions than the direct impacts of a terror attack. This leads to the important questions whether counter-terrorist policy should focus on reducing the risk of low probability events or rather on containing economically sub-optimal responses to terror and how to reconcile security with the principles of a liberalized global economy.

One important feature of global terrorism is its objective of harming the twin processes of economic growth in developed countries and of globalization in general; terrorism therefore has an important economic dimension. While the direct economic repercussions of terrorism, especially the repercussions of 9/11 have been very visible, what is less obvious and thus less entrenched in public awareness are the economic consequences of security measures and counter-terrorism policies. Most countries are committed to create and safeguard an area of freedom and security while at the same time building an area of prosperity and economic growth. Yet, the interplay between security, insecurity and economic prosperity are only preliminary understood in academic and policy circles. Our survey provides an overview of the executing research and it aims to *map the "state of play of research" on the inter-relations between the economy and security with particular focus on terrorism, and to identify the level*

of knowledge on the interaction between the cost distribution of both terrorism and anti-terrorism measures. Furthermore, it analyses the existing knowledge on the macro-economic impacts and the current understanding of underlying processes at micro-economic level. Apart from considering aggregate indicators such as fiscal and trade impacts, investment, growth and productivity, the survey assesses the existing research on the impacts of insecurity on behavioral patterns of consumers, households, the private sector (in general, as well as specific sectors) and policy makers, whose behavior constitute the drivers underlying the aggregate impacts at macro-economic level.

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