universität wien

DIPLOMARBEIT

Titel der Diplomarbeit

Terrorism: An Economic Perspective

Verfasser

Daniel Kon

angestrebter akademischer Grad

Magister der Sozial- und Wirtschaftswissenschaften
(Mag.rer.soc.oec)

Wien, im Februar 2012

Studienkennzahl lt. Studienblatt:	A 140
Studienrichtung lt. Studienblatt:	Diplomstudium Volkswirtschaft
Betreuerin / Betreuer:	Ao. Univ.-Prof. Mag. Dr. Wolfgang Weigel

Content

List of Tables

List of Figures

1. Introduction

On September 11, 2001 (9/11) the whole world watched stunned as a relatively small number of people committed an unprecedented act of terrorism on American soil, leaving about 3000 casualties and more than 6000 injured people. The nineteen al-Qaida-terrorists managed to hijack four commercial airplanes. Two of them were piloted into the towers of the World Trade Center in New York City and caused their collapse. One plane crashed into the Pentagon, the United States Department of Defense in Arlington, Virginia while the fourth airplane, presumably destined to hit a high-profile target in Washington D.C., crashed into a field in Pennsylvania due to passengers trying to fight the terrorists on board and taking control of the aircraft. These events changed the course of world politics for years to come. The „War on Terror", declared by former U.S.-President George W. Bush, led to wars, new alliances and hostilities between countries, far-reaching changes in legislation and an unprecedented increase of security measures in many areas, most notably for air traffic. Furthermore, the losses associated with 9/11 exceeded 80 billion U.S. Dollars and governments conducted large-scale reallocations of their resources towards security and defensive measures.

The fact that in this case ordinary objects were turned into lethal weapons led to widespread anxiety in almost every part of the world and an increased willingness to trade freedom for higher security. In addition, subsequent attacks in Madrid in March 2004 and London in July 2005 with 191 and 52 victims, respectively, made Europeans more aware of possible terrorist acts on their own soil and further increased fears and anxiety (Enders and Sandler, 2006).

The events of 9/11 were not the first terrorist attacks attracting attention on the world stage. However, its dimension, the huge number of casualties, the fact that the whole world was able to watch some of the events live, and the extensive coverage on television and other media separates these attacks from all previous terrorist activities. That is why 9/11 made a large number of people more aware of the sheer existence of terrorism and that anyone could become a victim of such an act of violence. It triggered many policy makers and scholars alike to deal with this issue.

The phenomenon of terrorism goes back to the very beginning of modern civilisation. One of the earliest examples that has been recorded is a terrorist campaign by a sect called „sicarii“ in ancient Palestine during the second half of the first century A.D. (Laqueur, 1978).

Modern-day terrorism – tactics that contained bombings and assassinations – could be experienced for the first time in Europe during the 1840s, when socialist radicals appeared all over the continent attempting to spark a revolution (Enders and Sandler, 2006). The long list of terrorist activities includes Russian anarchists and revolutionaries, anticolonial struggles in Algeria and Cyprus, the conflicts in Ireland, Northern Ireland and Sri Lanka, nationalist and separatist campaigns in Latin America and the Middle East, left-wing radicalism in Europe and Muslim extremism as displayed by al-Qaida and other organisations.

Since the development of terrorism, it has been studied by many scholars in different fields, primarily by political scientists and sociologists; however, historical and psychological studies also contributed to the discussion. Reasons and effects of terrorism were examined as well as ways to fight or prevent terrorist attacks from happening.

Political scientists focus mainly on the analysis of terrorist campaigns, tactics, finances, different groups and motives, state support and trends for decades. Comparative studies distinguish between different groups or involved countries and analyse the effectiveness of counterterrorist policies. Scholars from this field identified changes in the nature of terrorism, from terrorist organisations based on left-wing extremism in the 1970s to state sponsorship of terrorist activities in the early 1980s and the increasing threat of religious fundamentalism in more recent years. Historical studies help understand the evolution of the nature of terrorism over time while sociological research focuses on social structures and norms within societies affected by terrorism or within terrorist organisations.

Psychological studies analyse personalities or the minds of terrorists (Enders and Sandler, 2006).

In the aftermath of 9/11 this issue raised more and more attention from other disciplines, including economics. 9/11 made a large number of people more aware of the sheer existence of terrorism and the fact that anyone could become a victim of such an act of violence. It triggered policy makers and scholars previously not involved in the study of terrorism to deal with this issue. Economic approaches were used to analyse the way governments fight terrorism, suggest alternative ways to do so, discuss reasons, costs (that exceed the pure economic ones) and policies concerning terrorist activities. Theoretical tools like utility-maximising models and game theory are applied as well as empirical techniques, for example time series analysis.

The basis of economic analyses with respect to terrorism is a different approach to human behaviour. By applying rational-actor models terrorists are depicted as calculating individuals, who aim to optimise their utility and are subject to certain restraints (Enders and Sandler, 2006). Many people might reject the idea of terrorists being rational human beings because pursuing ones political or social goal by using violence differs from the desirable behaviour of most people and societies. But, as Enders and Sandler (2006) say: „in economics, rationality is not judged by objectives or norms of acceptable behaviour but by the manner in which an agent responds to environmental and other constraints. By responding in a sensible and predictable fashion to changing risks, terrorists are judged to be rational“ (Enders and Sandler, 2006: 11).

The science of economics offers very useful tools to deal with all kinds of problems concerning our society, not necessarily economic ones. It can help to understand those problems and provide solutions that cannot be found with other scientific approaches. The main difference between economics and other social sciences, like sociology, political science, law or psychology, is the way economists model human behaviour. It is characterised by the desires and restrictions of the individual, which are determined by institutions (Frey, 1990). Bruno Frey (1990) distinguishes between three kinds of institutions: First, decision-making systems, second, norms, traditions and other behavioural rules, third organisations.

Decision-making systems include the price system and the market, democracy, hierarchy or negotiating systems. All these procedures influence human behaviour systematically and therefore in a predictable way. Constraints within a price system are due to income and monetary prices of goods. In a democracy any actor has to adhere to elections and is therefore limited in his actions.

When it comes to norms and traditions there are a lot of rules that dictate or influence peoples' actions that can be seen as institutions. Some are defined by the government (e.g. laws and regulations) or a certain religion (e.g. ten commandments). Many of those rules, like traditions, are not written down explicitly but nonetheless are relevant to many societies and pose constraints to individual behaviour.

Organisations that have their own rules and therefore restrict human behaviour are the state, confederations, companies, bureaucracies, private clubs, families and other kinds of associations.

These three types of institutions are closely linked, they even could be seen as one entity with different aspects put forward (Frey, 1990).

Frey goes on to describe five elements, which determine human behaviour in the economic approach. They are:

1. The individual is the one who acts.
   The basis of any activity or event within a society is the actions of individuals. This includes their interactions with one another and with institutions and does not mean that individuals can be viewed as isolated. This approach differs in a fundamental way from theories where collectives act independently. Also psychological and sociobiological approaches, where split personalities and genetical conditions are taken into account, do not comply with the economic approach.
2. Human behaviour is governed by incentives.
   The actions of any individual are not random. Individuals react systematically and therefore predictably to incentives. They are not perfectly informed but are able to learn. They build expectations for the

future, act according to those expectations, and balance the advantages and disadvantages of available courses of action.

3. Incentives are generated via preferences and constraints.
   When people change their behaviour, economists do not consider this as a change of their preferences but as a reaction to changes in their environment.
4. Individuals are seeking their own advantage.
   The vast majority of people is neither inherently good nor bad but neutral and self-serving. However, acting in a self-serving way can also mean to look after other people (e.g. friends and family) because their wellbeing is in one's own interest.
5. Constraints, which are mainly due to institutions (as described above), define the space of possible actions.
   The main restrictions in economic theory are disposable income, relative prices of goods, and time.

From these elements one can derive the Law of Demand, a central law in economic theory. It says that the increase of the price of a certain good or service relative to other goods or services will – ceteris paribus – lead to decreasing consumer demand for that particular good or service and vice versa (Frey, 1990).

This approach to describing human behaviour differs considerably from other sciences and is controversial especially among psychologists and sociologists (Frey, 1990). This is not to say that the economic world-view is superior to any other approach, however, it can add a new, different angle to a lot of problems and – in combination with other sciences – help to analyse and understand them. This has been done in many different areas, probably most prominently in the field of political science, where the use of economic analysis became known as Public Choice Theory and the economic analysis of law became its own branch of research.

A possible application of economic methods in sociology is the rational choice approach (Frey, 1990). Another example for economic methods having an impact on sociological studies is in the context of migration and migration theory (Boswell, 2008).

By analysing the strategic interactions between terrorists and governments, governments and other countries, different terrorist organisations or even different interest groups within terrorist organisations and governments, economic methods can play an important role in the field of terrorism research and terrorism prevention. It can give insights into the behaviour of terrorists and targeted governments alike, as well as provide policy recommendations.

Rational-choice models allow us to explore how terrorists react to changes to their constraints, which are due to government policies on the one hand, and how governments react to their own changed environments, due to terrorist activities, on the other hand.

By using empirical tools one can assess the economic impact of terrorism. In addition, trends and cycles of terrorist campaigns all over the world can be identified and – in combination with the theoretical background – one might be able to predict the nature of future events to some extent.

The question why governments often fail to address terrorism appropriately can be approached with the theory of market failures. Sometimes the well-intentioned policies of particular administrations that attempt individual improvement do not yield socially efficient outcomes, which would benefit a larger number of countries (Sandler and Enders, 2004).

This thesis examines economic approaches to terrorism. Since this issue is a growing one and constantly draws more attention from economists, while at the same time it is still relatively unknown in mainstream economics, I aim to determine how an economic perspective and which economic methods can further the knowledge about this wide field. The most notable authors who have engaged themselves in economic analyses of terrorism are Walter Enders, Todd Sandler, Bruno S. Frey, Simon Luechinger and some others. They were my primary sources in covering most of the topics. Another important contributor is Howard Kunreuther. However, while his analysis and the entire approach of hazard research are worthwhile discussing, it goes beyond the scope of this thesis. Until now only few publications give a comprehensive overview of the broad variety of topics involved. This thesis will give a general outlook on all kinds of issues regarding terrorism where economics has added an alternative view to the discussion and contributed to understanding and analysing the phenomenon of "terrorism". In order to adequately cover the economic approach to terrorism, it is crucial to first create a general understanding of the issue. Due to this fact some non-economic features have to be discussed prior to the economic analysis.

This thesis consists of five chapters. Following this introduction, some definitions of terrorism and accompanying controversies are presented, as well as some key concepts used in the course of the thesis. Chapter 3 approaches the issues of counterterrorism and strategic interactions between the actors involved. It deals with different methods of fighting terrorism, presents alternative ways of doing so, and addresses the problem of imperfect social outcomes. Chapter 4 examines the impact of terrorism on several levels: the macro perspective, a certain industry, and the personal level are taken into account. An alternative approach to addressing effects on individuals is presented as well. Finally, some concluding remarks, involving advantages, shortcomings, and future research questions regarding this approach, are offered.

2. Definitions and Key Concepts

2.1. Definition of Terrorism

In order to classify certain events as terrorism and use this data for empirical research, a definition of the term is strongly needed. Terrorism is a far reaching issue and therefore has a number of possible definitions. A very comprehensive definition of terrorism is provided by Enders and Sandler (2006). It says that terrorism is „the premeditated use or threat to use violence by individuals or subnational groups in order to obtain a political or social objective through the intimidation of a large audience beyond that of the immediate victims“ (Enders and Sandler, 2006: 3). The two main parts of this characterisation are the presence (or threat) of violence and a social or political motivation. Violence is essential to pursue a political goal but avoid proper political procedures at the same time and make policy makers respond to demands. Without a political or social motive, acts of violence can merely be accounted as criminal acts. A further key ingredient of the definition is the broadening of the influenced audience. By making their actions appear to be random, terrorists manage to create anxiety among a broader public and therefore harm much more people than just the immediate victims of an attack. This puts additional pressure on governments to comply with the terrorists' demands because one of their main duties is to ensure their citizens' security. Any government that fails to do so will have a hard time to maintain its popularity and win elections. At least within a liberal democracy this would be the case. A rationally acting government must weigh the expected costs and gains of conceding to terrorists' demands against those of not conceding and then decide whether to give in to demands or not. Some factors that have to be taken into consideration include the perception of other potential terrorists, which might view concessions by the state as an incentive to engage in terrorism, loss of reputation for toughness and therefore encouraging more attacks, pressure from its own constituency to protect lives and property and ending hostage-takings or attacks by giving in to demands. Liberal democracies are more vulnerable than other forms of government. Therefore terrorist tactics are more effective in such countries (Enders and Sandler, 2006).

While terrorist attacks appear to be random they are in fact well planned and often carried out according to a tight schedule. Their perceived randomness forces targeted authorities to dedicate a big amount of resources to protect a wide range of potential targets.

Being rational actors – as explained in the introduction – terrorists consider risks, costs and possible gains of their activities very carefully. One indicator in favour of this claim is the fact that terrorist groups managed to engage in long-lived campaigns against considerable odds and gain some success against governments that had much more resources at their disposal. It can also be observed that terrorists put their operations in order according to risks: The modi operandi associated with the least risk are used the most and vice versa (Enders and Sandler, 2006).

2.2. Controversy Concerning Definitions of Terrorism

Although the definition above is very comprehensive, it leaves some room for open questions. Can an attack against passive military personnel be considered as an act of terrorism? What if governments are involved and use terror tactics against their own populations (as seen in Syria today) or support terrorist activities abroad? Can deliberate killing of civilians during a war be accounted as terrorism? While the last question does not fit the definition and is rather a war crime than an act of terrorism, some other of these questions are not that easy to answer. In some cases, other or wider concepts are needed to define the issue at stake. Enders and Sandler (2006) refer to a state using terrorism-like actions against their own citizens as state terror and therefore explicitly distinguish it from terrorism as defined(Enders and Sandler, 2006). While – under this definition – terrorists are individuals or subnational organisations but not the state itself, governments can, however, provide some degree of assistance to perpetrators. In the case of countries supporting terrorist organisations through training, funding, intelligence, and providing them with weapons and "safe havens", the term *state-sponsored terrorism* is used most often. Famous cases of such acts include the Libya-sponsored attack on Pan Am flight 103 over Lockerbie, Scotland in December 1988 that resulted in crashing the airplane and killing 270 people, as well as various operations of Hezbollah and Hamas, two radical Muslim groups that are supported by Iran, against Israel. The Iranian Government is also accused of being involved in the bombing of the Jewish Community Centre in Buenos Aires, Argentina in July 1994 that killed more than 80 people and injured hundreds. According to the United States Department of State the list of states sponsoring terrorism includes Libya (before the overthrow of Gaddafi), North Korea, Iran, Syria, Sudan and Cuba (US Department of State, 2011).

Another problem of the definition above is that it is not accounting for different political characteristics. That is why "every sovereign state reserves to itself the political and legal authority to define terrorism in the context of domestic and foreign affairs" (Alexander and Alexander 2002:1, in Schneider et al., 2010a). Ones' point of view plays a significant role as well. History has shown that "terrorists" have become "freedom fighters" after power shifted (Schneider et al., 2010a). Nevertheless, by using terrorist tactics, any groups' violent activity can be accounted as terrorism, even when it pursues a legitimate cause (I consider the violent behaviour of some groups during the Zionists' struggle for an independent State of Israel in the late 1940s as an example for this).

The difficulties associated with defining terrorism properly are illustrated when looking at different definitions used by different countries and international bodies, or even by different departments within the same government.

An interesting example can be found in the definitions of different governmental departments in the United States. The Department of State defines terrorism as "premeditated, politically motivated violence perpetrated against non-combatant targets by subnational groups or clandestine agents" (US Department of State, 2010).

For the United States Department of Defense terrorism is the “unlawful use of violence or threat of violence to instill fear and coerce governments or societies. Terrorism is often motivated by religious, political, or other ideological beliefs and committed in the pursuit of goals that are usually political“(US Department of Defense, 2011).

The State Departments’ definition highlights non-combatant targets, meaning unarmed or off-duty military personnel and civilians. It does not say anything about threats to use violence.

There are significant differences between those two definitions. As opposed to the State Department the Department of Defense does not differentiate between combatant and non-combatant targets. Under this definition an attack on armed military would be terrorism. Furthermore the Department of Defense mentions threat of violence explicitly, as well as religious and ideological beliefs as motivation for engaging in terrorism. The State Departments’ definition identifies “subnational groups or clandestine agents” as perpetrators of terrorism, in contrast to the Defense departments’, which is silent on who commits terrorist acts.

Yet another definition, provided by the U.S. Department of Justice and the FBI, deviates slightly from those two definitions. It includes violence against property but remains silent on whether the direct victims of an attack are combatant or not as well as on religious and ideological motives (US Department of Justice, 2005).

This demonstrates nicely that even several departments within the same government do not completely agree on the definition, although all of their definitions include the basic ingredients – namely perpetrator, victim, broader audience, violence and political motivation – and just differ in details.

Even more importantly, there is no common international definition of terrorism in the United Nations, which is due to disaccords between members of the UN. Member states are not able to agree on basic principles, i. e. whether state terror can be accounted as terrorism or not and whether the uprising against tyranny or occupation using terrorist tactics is a legitimate form of resistance or terrorism (United Nations, n.d.). This, of course, has political reasons. Some countries do not want to be forced by a formal definition to condemn acts of terrorism against countries that are not widely accepted. Especially the Organisation of the Islamic Conference (OIC) refuses to accept it as worth to condemn violent attacks against specific targets, most notably Israel and India (Eye on the UN, 2011). Therefore a universal definition of terrorism in the United Nations could not be established so far.

As already stated above, distinguishing terrorism from warfare is another tricky issue. Terrorism deliberately targets indiscriminately combatants and non-combatants alike, as demonstrated by the attacks of 9/11. By contrast, in order to limit collateral damage and target only combatants, weapons used in a war should be highly discriminating. The examples of the bombings of London, Tokyo and Dresden during World War II show that this is not always the case. Since those events took place during a declared war and were perpetrated by governments, they are not accounted as terrorism (Enders and Sandler, 2006).

2.3. Domestic and Transnational Terrorism

A main distinction must be made between domestic and transnational terrorism. *Domestic terrorism* means that perpetrators, victims and audience are all from the same country. This particular country has to suffer all the consequences and can be self-reliant in order to address domestic terrorism and take antiterrorist measures. There are no costs or benefits for foreign countries. (Enders and Sandler, 2006). If a terrorist incident involves more than one country (e.g. hijacking of an airplane that starts in one country and ends in another) it is referred to as *transnational terrorism*. More generally, transnational terrorism involves “victims, targets, institutions governments or citizens of another country” (Sandler and Enders, 2004: 2) than the one, where the incident takes place. Most terrorist activities against US interest do not happen on American soil. Even the 9/11-attacks, although carried out in the United States, were clearly a case of transnational terrorism. The attacks where planned abroad, the perpetrators were foreign citizens and the victims included people from about ninety different countries. Furthermore, the consequences (e.g. the Afghanistan war and global financial repercussions) included a large number of countries and the audience, which the terrorists intended to intimidate, was not just Americans, but the entire "Western World". Any attack against a multilateral organisation, such as the UN, can be accounted as transnational as well.

2.4. Externalities and Public Goods

Transnational terrorism also means that any country's policy regarding this threat is interdependent with other countries. American efforts to secure its boarders and airports could lead to a shift of attacks against American citizens, interests or property abroad, where security measures might not be as tight as on U.S. soil.

A military strike against al-Quaida-training camps or "safe havens" benefits not only the country that conducted the operation, but any potential target of al-Quaida.

Those are two examples of externalities – negative and positive, respectively – resulting from anti-terrorist measures by one country.

An externality, or external effect, arises when one agent imposes consequences on another agent through his actions, without those consequences being accounted for. In the case of a negative externality, or external cost, the provider does not compensate for harm done to other parties. A positive externality, or external benefit, means that the provider is not being compensated for the benefits enjoyed by others. When any of those activities involves agents in another country, a transnational externality appears.

Other examples of externalities are shared intelligence on a common terrorist threat provided by one country to others or terrorist groups using tactics of other campaigns. This positive externality for terrorists, accelerated by reports of the media, could be observed in a number of cases. Some Zionist groups' – who adopted and improved tactics used by Irish separatists – use of urban terrorism against the British rulers in Palestine proved its effectiveness and was later used by the Irish in their own struggle against British troops, as well as by Algerian and Uruguayan terrorist campaigns (Enders and Sandler, 2006).

The implementation of anti-terrorist measures developed by others (e.g. air marshals on planes) is a positive externality as well.

As already mentioned, an attack against members or the infrastructure of a terrorist organisation benefits all potential targets. Those benefits have two major characteristics: they are non-excludable and non-rival. Non-excludability refers to the fact that once such a good is provided, payers and non-payers alike (or in this case provider and non-provider) benefit from it. It is not possible to exclude others from enjoying the benefits. This might lead to a free-rider problem, where consumers have the incentive to take advantage of the provision of this good without contributing. Since potential providers might rely on one another, this ultimately results in underprovision of such a good.

Non-rivalry means that one users' consumption of this good has no effect at all on others. A strike against a terrorist organisation produces the same benefits for all potential targets, no matter if there are nine, ten or a hundred of them.

In having these characteristics, such a strike fits the definition of a pure public good.

These concepts will be used in chapter 3, where ways to fight terrorism will be discussed.

2.5. Motivation and Modi Operandi

There are many reasons for various groups to engage in terrorism. Some are motivated by ethnic or nationalistic conflicts and try to establish a state for an oppressed population. Other motives are religious, ideological or specific issues. The way such an organisation operates depends highly on its objective. Left-wing extremists in Europe in the 1970s used assassinations, kidnappings and bombings to blackmail, intimidate and pressure their respective governments, but did not want to kill indiscriminately. On the contrary, they wanted to be popular and win over a constituency. This does not apply to most situations that involve territorial, ethnic or religious conflicts.

Another motive is to raise awareness of a certain issue. A high profile event with a lot of media coverage is an ideal stage for such an undertaking. The operation of Palestinian terrorists against Israeli athletes during the 1972 Olympics in Munich, which resulted in the death of all hostages and some terrorists, was aimed at triggering more attention of the world media towards the Israeli-Palestinian conflict.

Some terrorists use legitimate political actions to pursue their goals. Hamas, Hezbollah, the IRA, ETA and others have wings that function as political parties. Those groups have to allocate their resources between using violence and political means to achieve the best possible outcome (Enders and Sandler, 2006). On the other side it is a difficult task for governments to find an appropriate way to deal with political wings of terrorist groups. Denying their legitimacy could push those groups towards engaging in more violence; treating them as ordinary political contenders would contradict the widespread conviction of not negotiating with terrorists.

As explained earlier, the reasons why terrorists choose a certain mode of attack are related to both, their objectives and their rational calculations, including expected risks, costs and benefits of an attack. Terrorist tactics include hostage missions (skyjackings, kidnappings etc.), bombings (incendiary bombs, letters, explosives, car bombs etc.), assassinations, threats and hoaxes (by phone, letter etc.), suicides attacks, armed attacks, sabotage, the spread of propaganda, legitimate efforts trough a political wing, and others. Terrorists getting hold of weapons of mass destruction, like chemical, biological or nuclear weapons, is a growing concern.

In order to finance their operations terrorists often engage in criminal activities, like drug trafficking or bank robberies. Hostage missions for ransom are another way of acquiring money for the purpose of terrorism (Enders and Sandler, 2006).

3. Counterterrorism and Interaction

Right after 9/11, the most devastating terrorist attacks on American soil, U.S.-President George W. Bush declared a “war on terror“. This declaration was followed by a U.S. lead invasion of NATO troops in Afghanistan with the goal to destroy the infrastructure and “safe havens” of al-Qaida. A couple of years later, the so called „coalition of the willing“, again under the leadership of the United States, started a war against Iraq and the government of Saddam Hussein. The implementation of the patriot act, which limited civil rights in the U.S. and the creation of the Department of Homeland Security, which received wide spread competences, were direct consequences of the 9/11-attacks and part of the „war on terror“ as well. New security standards on airports and planes were established and visible all over the world. Elsewhere, a high level of security and the use of military force against terrorist groups (e.g. Israel against Hamas and Hezbollah) as a reaction to violence and threats existed for a long time. However, 9/11 and the subsequent events brought this issue to a bigger stage and provided more attention for policies regarding terrorism. That is why a larger number of scholars took an increasing interest in analysing not only the reasons and motivations for terrorism but also efforts and strategies to combat terrorism.

The question, how to react properly to terrorism, is difficult to answer and stirs a lot of controversy in the public debate. Is military force an adequate method to fight terrorism? Are cutbacks of civil rights justified? How far can a liberal democracy go, to exercise the duty of protecting the lives of its citizens, without betraying its core principles? How are others, who share the same threat, affected by precautionary measures and actions conducted by one country, especially in an era of international terrorism? These are just some of the questions, where economic theory can be instrumental in understanding difficulties and finding solutions and therefore have been addressed by economists.

In the course of this chapter I will outline some of the concepts regarding economics of counterterrorism. Well-established methods and policies to fight terrorists or preventing attacks from happening are going to be discussed as well as alternative approaches. Considerations concerning strategic interactions between governments, terrorists and different agents with differing approaches within those groups are also playing an important role. But to begin with, I will introduce a simple theoretical framework, the model of subjective expected utility maximisation, to terrorism, in order to analyse how prospective terrorists respond to certain policies.

3.1. The Rational Choice Model

This framework, the rational choice model as described by Frey and Luechinger (2002a), enables us to look at how different policies can influence the behaviour of terrorists and therefore decrease the number of terrorist activities. Figure 1 illustrates the terrorists' marginal cost and benefits as a function of the extent and intensity of terrorism, which can be measured in different ways. The numbers of incidents, fatalities or a certain mode of attack can all be used as indicators for T.

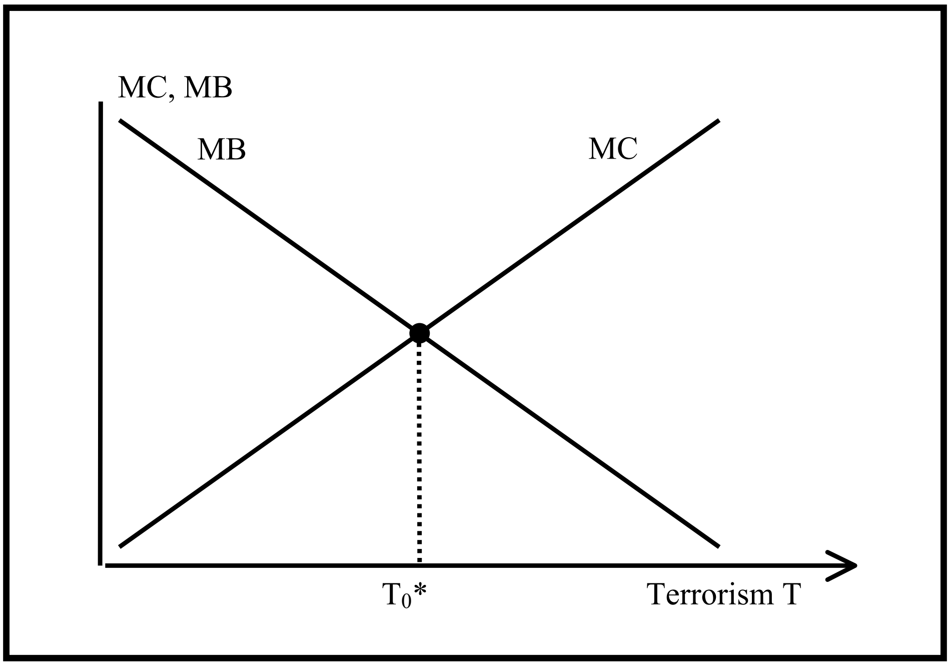

Figure 1: Marginal costs and benefits of terrorism (Frey and Luechinger, 2002a: 3)

The marginal benefit curve MB is a reflection of the terrorists' benefits of conducting an additional act of terrorism. Since more terrorism is expected to have less and less effect on a targeted society, this curve slopes downwards. This does not have to be the case, but in general societies tend to learn how to deal with terrorism and how to react properly and therefore decrease their own marginal effects over time. Thus, slope and position of MB depends on the behaviour of the targeted society.

In contrast the marginal cost curve depends on the terrorists themselves. This curve describes the costs for terrorists for carrying out an additional act of terrorism. Because it becomes more and more difficult to carry out an attack, the costs are increasing. Therefore MC is sloping upward. The increasing costs are associated with more time that has to be invested in the preparation, more intelligence that has to be gathered and with more security at potential targets. Additionally more engagement in terrorism also raises the risk of getting captured, interrogated, imprisoned or even killed. MC does not necessarily have to be linear, but can also become increasingly steep. However, this does not affect the following analysis.

The intersection of those two curves determines the equilibrium extent and intensity of terrorism. From the perspective of potential terrorists this is the optimal level of terrorist activity. The theory suggests that this T* is in accordance with the actual amount of terrorism observed in reality (Frey and Luechinger, 2004). Now one can take a closer look at how T* can be affected by shifting either of the curves.

The most common way of fighting terrorism is by using deterrence policies. They aim at increasing the risks for terrorists and making it more difficult for them to succeed. The threat of more severe punishment is also a method of deterring. By doing so, those policies raise the costs of potential terrorists. This effect is shown in Figure 2.

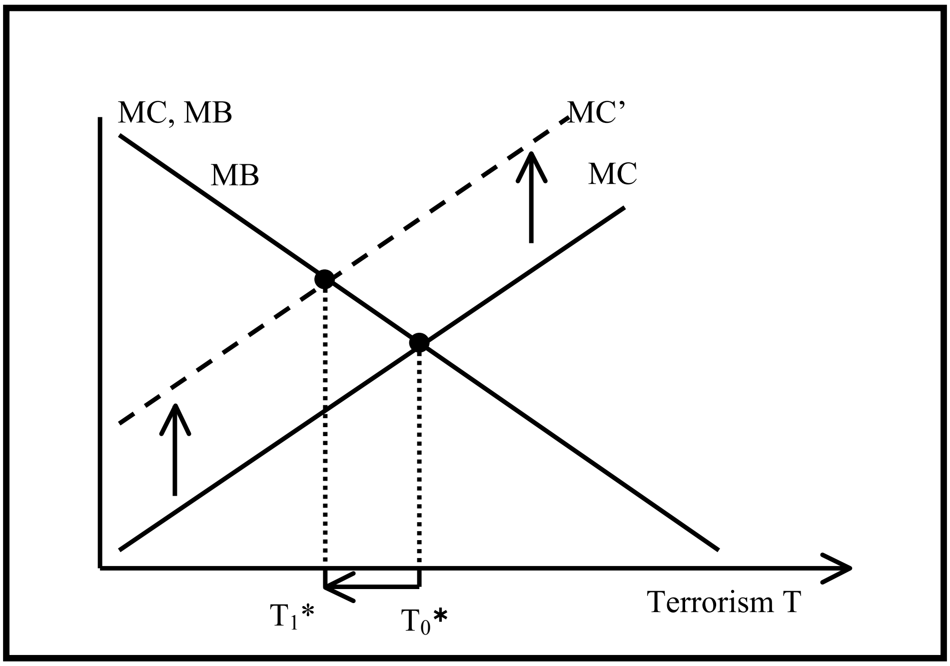

Figure 2: Increasing the costs of terrorism (Frey and Luechinger, 2002a: 7)

Deterrence policies and the subsequent shift of the marginal cost curve lead to a smaller number and less intense terrorism. The assumption that the behaviour of terrorists can be affected by deterrence in general holds true, although there might be situations where this is not the case. Religious or political fundamentalists, who are not motivated by incentives from outside but exclusively from within, are probably less impressible by high risks or severe punishment. However, the vast majority of potential perpetrators of terrorism can be pictured as rational actors as described previously. Thus deterrence seems to be an effective way of countering terrorism and therefore receives the biggest amount of attention from both, scholars and policymakers (Frey and Luechinger, 2002a). Critique concerning this type of policies and possible alternatives will be discussed later. In the following a range of deterrence policies and some of their characteristics will be presented.

3.2. Proactive Policies

A proactive, offensive policy confronts perpetrators of terrorism directly. It attacks their resources, infrastructure, finances and sponsors. Killing members of terrorist groups, destroying training camps, safe houses, communication networks and weapons are proactive actions. They can occur in the form of retaliatory raids against perpetrators or sponsors and providers of financial or infrastructural assistance. The invasion of Afghanistan by NATO troops in 2001 was aimed at toppling the ruling Taliban regime, which hosted training camps of Osama Bin-Laden's al-Qaida and provided them with an area to retreat. Other examples of retaliatory raids include Israeli attacks against Palestine Liberation Organisation (PLO) infrastructure in Syria, as a response to the deadly Palestinian attack against Israeli delegation members at the 1972 Olympics in Munich, and American bombings of Libyan targets after an attack on Americans in West Berlin in 1986. However, retaliatory raids are often not very effective. They hardly limit the ability of terrorist groups to operate and in many instances serve merely as a signal to those groups or to the own population. In contrast, preemptive strikes are seen as being more capable of severely harming a terror organisation or state sponsor (Enders and Sandler, 2006). Assassinations of leading Hamas operatives by the Israeli army and various attacks on al-Qaida camps and leaders in Afghanistan have seriously compromised those groups' capabilities. Gathering intelligence by infiltrating terrorist groups or going after their financial resources by freezing assets are proactive actions as well.

There are a number of problems associated with some of the proactive policies. A strong reliance on military action could spark the false impression of a regular war, which under normal circumstances can be either won or lost. This is not the case with terrorism. Some groups may be defeated, but terrorism itself cannot be abolished solely by military means. Moreover, a war usually turns world opinion against the conducting country and might therefore spark additional hostility, which can lead to more terrorism. Secondly, it is not possible to entirely measure the success of military action. It cannot be said how many attacks were prevented by a military strike. Additionally, a decline in the number of attacks could be due to other reasons as that are not identified. Furthermore, such a decline does not necessarily need to be a success, since attacks could become more devastating or happen in other countries.

Since proactive policies represent a pure public good – as already defined in chapter 2 – they provide non-excludable and non-rival benefits to all potential victims of targeted terrorists. Some nations tend to rely on others to undertake risky operations and benefit without contributing. This so called free riding will ultimately lead to underprovision of this public good. Because there is no authority on the transnational level, nobody can manage the right allocation of resources in a unified attempt to engage in proactive policies. In recent years, the world community has mostly relied on the United States to coordinate and conduct military strikes against terrorists. In absence of a supranational government and a collective approach to proactive policies, the latter might also lead to unintentional negative consequences for at least some involved nations. Enhanced recruitment of terrorists as a result of grievances after military action of one country against a certain group may foster terrorist activity against that country's interests in another country. In this case a proactive policy would become a public bad, as it imposes costs on other agents (Enders and Sandler, 2006).

3.3. Defensive Policies

As opposed to proactive policies, defensive policies try to reduce the likelihood of success of attacks or making them more difficult and risky for the perpetrators. Defensive measures also aim at reducing losses after an attack has already happened. In most cases they are reactive and imposed only after incidents took place and vulnerabilities were revealed.

Some defensive actions are intended to harden a target by improving security at airports, embassies, government buildings and other endangered locations. Another defensive measure is raising penalties for convicted terrorists. The deployment of sky marshals on airplanes, the decision to allow shooting down hijacked commercial planes, which could be used as weapons, the installation of technological barriers, like metal detectors or terror alerts to warn the public are some more examples of defensive measures (Enders and Sandler, 2006).

Many of those measures have proven to be effective (e.g. the installation of metal detectors on U.S. airports decreased the number of hijackings dramatically (Enders and Sandler, 2006)) but defensive actions against terrorism are associated with a number of problems as well. First of all, similar to proactive policies, their success rate is hard to measure. It is nearly impossible to say, how many potential perpetrators were put off by high security standards or deterrence measures. Moreover, defensive policies do not bring an end to terrorism but merely lead to a shift towards less dangerous, or cheaper, modi operandi (Schneider et al., 2010b) or to attacks against targets that are less secure (Enders and Sandler, 2006). However, this conclusion does not hold true in every case. "(…) 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" (Schneider et al., 2010b: 6).

The nature of this kind of public good is different from proactive policies. It rather constitutes a negative externality because it deflects terrorism into other areas. Furthermore – unlike proactive measures – it tends to be oversupplied (Enders and Sandler, 2006). In order to find the right balance between proactive and defensive measures, which would benefit all countries threatened by terrorism, a distinct international cooperation would be needed. The lack of a supranational authority and the understandable fact, that every government prioritises is its own security, result in the suboptimal situation, where the two kinds of counterterrorism measures are not in equilibrium.

3.4. Disadvantages of Deterrence

Apart from the problems mentioned above, deterrence policies are exposed to some heavy criticism. Especially Frey and Luechinger (2002a) argue that this approach might have more disadvantages than benefits. In many cases deterrence leads to the accumulation of power (e.g. the establishment of the Department of Homeland Security) and subsequently creates a very attractive and vulnerable target for additional terrorism. Moreover, policies that limit civil rights in order to make it easier for law enforcement agencies to track down potential terrorists and prosecute them might backfire. Because those cutbacks in civil liberty, which are often a direct result of the struggle against terrorism, are widely seen as a severe intrusion into an accustomed way of life, they can be accounted for as a success for terrorists, who aim at disrupting a society. Ironically, limitations of the right to assemble and express deviating political positions might serve as an incentive for some groups to engage in violence rather than using legitimate channels to bring forward their agenda. Frey and Luechinger (2002a) are therefore of the opinion that deterrence policies not only raise the marginal costs for prospective terrorists, but also increase their marginal benefits. This effect is illustrated in Figure 3.

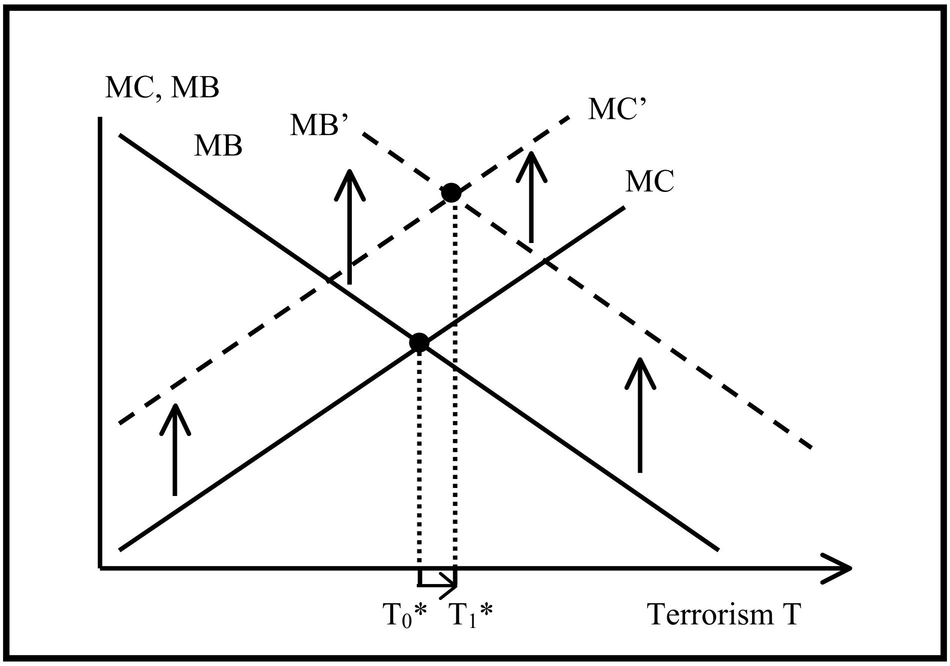

Figure 3: Countervailing effects of deterrence (Frey and Luechinger, 2002a: 15)

As one can see, the effect of both curves shifting upward is an increase in the level of T*, the number and intensity of terrorist acts. While deterrence is likely to have its desired effect in the short term, it certainly could be a counterproductive solution in the long term (Frey and Luechinger, 2002a). That is why alternative approaches to fighting terrorism are needed.

3.5. Alternative Policies

Frey and Luechinger (2002a) suggest that the best and most effective way of decreasing number and intensity of acts of terrorism would be to lower the benefits instead of increasing the costs of prospective terrorists. The illustration of this effect is depicted in Figure 4.

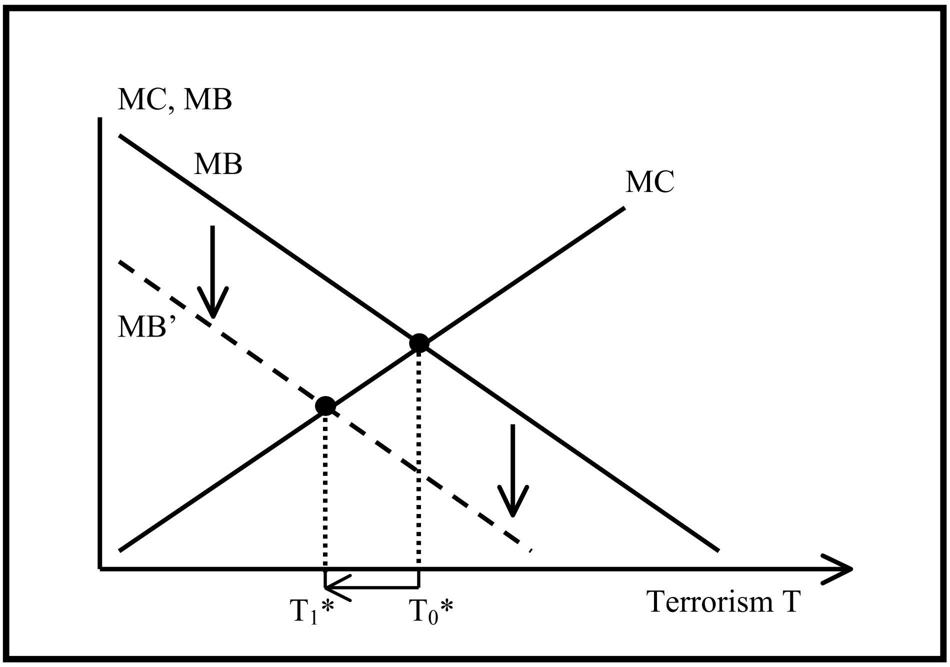

Figure 4: Reducing the benefits of terrorism (Frey and Luechinger, 2002a: 8)

But how can this shift of MB – which would mean that engaging in terrorism becomes less attractive – be achieved? In order to answer this question one has to consider the goals of perpetrators of terrorism. Among all implications and objectives presented in the chapter "Definitions and Key Concepts", I want to focus on three specific issues here:

1. In order to reach a broader public for their cause, terrorists seek the attention of the media. Many groups prefer to carry out their attacks in bigger cities or even in the capital of country, because they feel that

terrorist acts, which are not reported by the media, are a waste of resources and effort.

2. Terrorists aim at destabilising the polity. Their chances of succeeding are increased if not only the power of the government vanishes, but the legitimacy of the whole political system is compromised.
3. Terrorists want to harm the economy. By imposing material costs on a large part of the population, they want to increase the pressure on the government by its own constituency to comply with their demands (Frey and Luechinger, 2004).

The more terrorists succeed in achieving those three goals, the more it becomes an attractive option to engage in additional terrorism and the more likely a higher level of T* will be reached.

The three issues are not entirely independent from each other, since political success depends on a well functioning and prosperous economy as well as on a general atmosphere transported by the media. Excessive media coverage of terrorist activities can have an impact on peoples' expectations concerning their security in the future. This could lead to a change in consumer and electoral behaviour and therefore influence both, the economy and politics.

Frey and Luechinger (2002a and 2004) suggest that one effective way of providing disincentives for terrorist activities is decentralisation. By decentralising both, political power and the economy, those fields become less vulnerable as a whole and therefore constitute less attractive targets for terrorists. A political structure, where decision-making and implementation is spread over many different centres, is very difficult to destabilise. A hit against one of those centres might disrupt a certain area of government, but not the entire system. Besides, other centres with a similar expertise could take over and restore the government's capacity rather quickly. Frey and Luechinger (2002a) provide two examples to back up this theory. In 2001 a gunman killed three out of seven members of the regional government council of the Swiss canton Zug. In addition, eleven members of parliament were killed and a high number of members of parliament and government were injured. Despite this devastating act of violence, the local government was well functioning again within a short period of time. Thanks to its federalist structure and because of widespread autonomy of communes and districts in Switzerland, the political system of Zug did not suffer a major disruption.

In contrast, a similar incident in much more centralised Armenia had a greater effect on the country. After the Prime Minister, the Speaker of the Parliament and seven other government members were assassinated in October 1999, no local branches of the government were able to absorb the power vacuum and Armenia experienced a severe political crisis (Frey und Luechinger, 2002a).

The decentralisation of political power is based on two principles. First, the division of power between the branches of government – judiciary, legislature and executive – is an important feature of distributing political power among a number of different actors. Moreover, a decentralised media is equally important. Controlling an entire country's flow of information by taking a major TV station is impossible if there is more than one major media outlet. Second, dividing power among different levels of government further decentralises a political system. This can be achieved by granting far reaching authority for local governments and partly autonomous regions. Those principles make it more difficult for terrorists to disrupt an entire political system and therefore decrease their marginal benefits of engaging in terrorism.

When it comes to the economy, a large number of competitors within a market, as opposed to a monopolistic structure, is essential to recover from a terrorist attack. The events of 9/11 are a good example for an economy recovering quickly after it has been hit devastatingly. The more an economy is based on market principles, the less vulnerable it becomes to attacks as a whole, which makes it less attractive for terrorists to target. The overall effects of terrorism on the economy will be discussed later.

Because different types of terrorists engage in different modes of attack, this anti-terrorism strategy may not be seen as an instrument against every kind of terrorism. Religious extremists, for example, are interested in spreading anxiety by killing civilians seemingly indiscriminately. They might not respond to those kinds of incentives as much as others, namely terrorists motivated by political extremism, ethno-nationalistic or separatist conflicts. Nevertheless, Frey and

Luechinger (2004) believe that this policy might be effective against a significant amount of terrorist acts (Frey and Luechinger, 2004). The approach of decentralising activity has sparked little attention from both, academia and politics. It is also not very likely to be imposed as an explicit policy against terrorism, because it is not as visible as deterrence measures and therefore less attractive for re-election seeking politicians (Frey and Luechinger, 2004).

One indication for the effectiveness of decentralisation is the fact, that many terrorist groups associated with al-Quaida operate as separate cells, without having apparent ties to a centralised command, and are therefore difficult to fight.

Another possible way to decrease the marginal benefits of potential terrorists is presented by Frey (1990). He suggests tackling their desire to reach a broad public and therefore getting the media involved. This can be done by simply denying terrorists any attention. Withholding all information concerning terrorist activity might be a way to implement such a policy, but it is impossible to hide an event like a terrorist attack from the immediate public or the media, and cannot be kept quiet without severely compromising the freedom of the press. Even if government and media would come to an agreement so that a terrorist incident will not be publicised, this approach seems problematic from a democratic point of view. Besides, such an agreement would be even more difficult to reach with foreign media. For those reasons, this approach is doomed to fail, at least in liberal, democratic societies. Autocracies or dictatorships might apply such a strategy without serious resistance. However, Frey (1990) identifies another possibility to deny terrorists much desired attention and therefore reduce their benefits from terrorism. He suggests that governments should weaken the information presented about terrorists in the media by supplying the public with their own additional information. By stating that more than one group could be responsible for an attack, it is possible to deny a certain organisation credits. In doing so, any benefits for the terrorist gorup diminish as well. Even if a group publicly claims responsibility for an attack, a government could still argue that such claims cannot be confirmed. In many cases more than one group has claimed responsibility for an incident. Sometimes different groups fake claims in order to get more attention. These and similar arguments, as well as stating that it is not the government's but the judiciary's task to determine whether a certain group is responsible for an attack or not, could be brought forward. Frey (1990) believes that such a policy can have a crucial impact on the behaviour of terrorists and reduce the number of terrorist incidents significantly. Nevertheless there is a number of problems associated with this approach. First of all, the public has the right to know who is responsible for an attack. If the government knows exactly whom to blame, the question whether to lay this open or not poses a moral dilemma. Second, it is quite unrealistic that a policy of denying public recognition to a terrorist group will be implemented – similarly to the decentralisation approach. Politicians will rather clearly recognise the enemy and try to find and prosecute them in order to record a success. A strategy where the number of terrorist attacks decreases over time and success might just become visible in years is not likely to be favoured by politicians (Frey, 1990).

All policies presented in this section are aiming at finding an alternative to deterrence, which does not seem to be ideal as the only approach to fighting terrorism. Diminishing the number and intensity of terrorist acts by decreasing the marginal benefits of prospective terrorists is one, but not the only possibility to do so. Increasing the opportunity costs is another one. This approach will be discussed in the coming section.

3.6. Increasing Opportunity Costs of Terrorism

Any rational terrorist with a political or social objective is faced with a choice whether to pursue his goal through legitimate channels or engage in terrorism. This consideration is depicted in Figure 5.

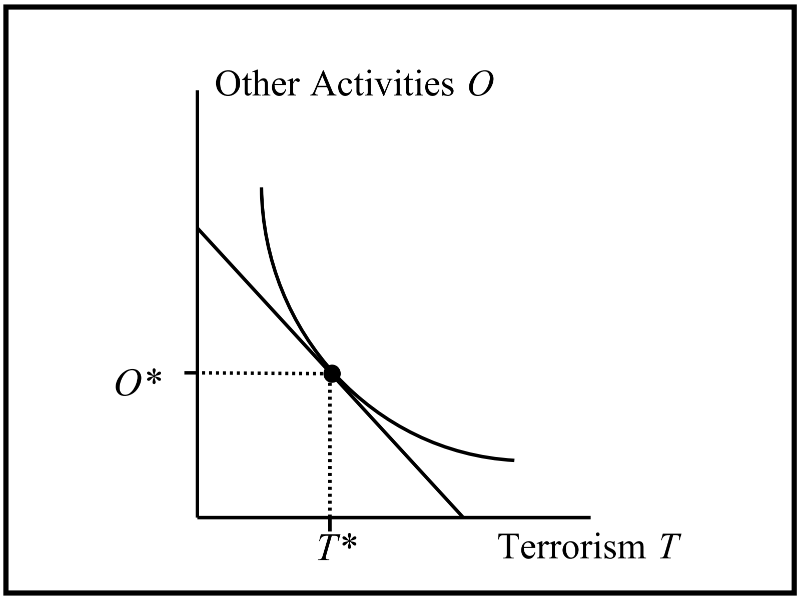

Figure 5: Decision calculus of a prospective terrorist (Frey and Luechinger, 2002b: 5)

Here the shape of the indifference curve is determined by the effectiveness of terrorism in achieving a certain goal and by the preferences of the prospective terrorist. The point where the indifference curve and the budget constraint are tangent to each other identifies – similar to the depiction in Figure 1 – the equilibrium extent and intensity of terrorism T*.

Frey and Luechinger (2002b) explain: “The opportunity costs faced by potential terrorists consist in the utility they could gain by not engaging in terrorism. These are the activities they can undertake outside of terrorism. Higher opportunity costs reduce the willingness of a (potential) terrorist to commit terrorist activities. An increase in the opportunity costs or, equivalently, a reduction in the costs of all other activities, therefore reduces the amount of terrorism” (Frey and Luechinger, 2002b: 8) Figure 6 illustrates this effect.

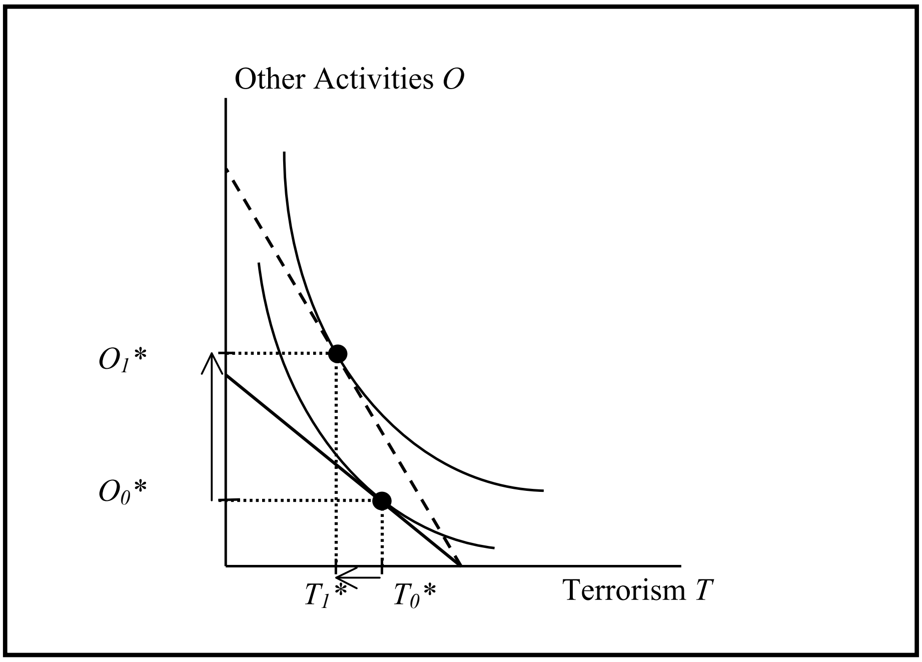

Figure 6: Increasing the opportunity costs of terrorism (Frey and Luechinger, 2002b: 9)

As one can see in this figure, the budget constraint rotates upwards along the axis that indicates other, non-terrorist activities. This subsequently leads to a lower equilibrium amount of terrorism. According to Frey and Luechinger (2002b) such an approach is superior to other policies countering terrorism in the following way: Due to more opportunities apart from terrorism, members become less dependent on their terrorist group, which makes it easier to leave such an organisation. Another result of more available opportunities outside of terrorism is an increasing tension within a terrorist group. Everybody could leave the group and become a traitor. Due to these inner tensions the group itself becomes less effective. This characteristic of the policy of increasing opportunity costs strongly opposes the deterrence approach, which leads to a stronger solidarity among members of the same group. Additionally an increased interaction between terrorists and the rest of the society creates a positive sum interaction and therefore raises chances for peaceful resolutions of the conflict.

Increasing opportunity costs is not easy to do, but Frey and Luechinger (2002b) offer three concrete suggestions:

1. Persons that tend to embrace terrorist ideas and actions should be invited to visit foreign countries. The confrontation with different ideas and

cultures might broaden their horizon and soften their conviction. According to Hardin (2002) interaction between different groups is very likely to reduce extremist views. Frey and Luechinger (2002) state that he "starts with the premise that a person's knowledge depends on the costs and benefits of acquiring pieces of knowledge and then applying them. Because of the high cost of discovering and verifying every bit of knowledge, people typically rely on sources of authority and the society in which they spend most of their lives" (Hardin, 2002 in Frey and Luechinger, 2002b: 10). Therefore, people have almost no incentive to concern themselves with beliefs that are inconsistent with the ones of their society. Social interactions with "the enemy" are likely to break this cycle.

2. Principle witness programmes for people involved in terrorist activities should be offered. These programmes could include exemption from punishment, protection from retaliation or money in return for leaving a terrorist group and supplying authorities with valuable information. Governments should not only submit such offers to convicted terrorists – which has been done successfully in the past – but also to current members of terrorist organisations.
3. Terrorists should be offered a discussion, which takes their convictions seriously and tries to find a compromise. Participating in the political process would lower the costs for terrorists of engaging in legal methods and therefore increase the opportunity costs of terrorism (Frey and Luechinger, 2002b).

These suggestions bear significant problems and disadvantages. It has been proven, that studying abroad and living in a modern, liberal surrounding does not necessarily prevent from having extremist beliefs and engaging in terrorism. The terrorists that carried out the attacks of 9/11 serve as an example for this claim. They where mostly brought up in secular families and partly studied and lived in Europe. Engaging in political debates with terrorists contradicts fundamental principles of many countries. Treating them as regular political contenders could be viewed as rewarding terrorism, which could serve as an incentive to engage in political violence instead of pursuing a longsome process of legitimate political activity. Principle witness programmes seem to be a reasonable idea, but they are associated with severe difficulties on the part of potential participants, which is a huge disincentive for them. Moreover, terrorist groups could use those programmes for their own advantage by putting own member into such programmes in order to mislead the authorities.

Overall such an approach has both, advantages and disadvantages and at least parts of it are certainly worth considering.

The policies inspired by economic methods that are discussed in this chapter are categorised and illustrated in Table 1:

	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

Table 1: Classification of counterterrorism measures (Schneider et al. ,2010b: 17)

3.7. Strategic Interactions

Now that governments have a variety of anti-terrorist policies at their disposal, they have to decide to which extent those policies should be implemented in to order to allocate their resources in the most efficient way. However, before they can do this, they have to make the decision whether to implement any policy at all. This depends not only on the government's preferences and priorities in this regard, but also on the behaviour of the terrorists. In the case of transnational terrorism the behaviour of other targeted governments has to be considered as well. Since no supranational authority exists, which coordinates anti-terrorism policies to get the best result for everyone, countries understandably prioritise their own interests. This might lead to an outcome, which is far from ideal. With the help of game theory such problems can be analysed. To give one example, let us assume that two countries (A, B) try to decide whether or not to engage in a preemptive military strike against a common terrorist threat. The costs of an attack are 6 for both countries. If both attack, they could do more damage, which would double their benefits without increasing costs. If only one country attacks, its public benefit would be 4. If the status quo is preserved by no military action at all, no one gains or loses anything in this game. The payoffs of the game are depicted in Figure 7.

Country B

		Status quo	Preempt
Country A	Status quo	**0, 0**	4, -2
	Preempt	-2, 4	2, 2

Figure 7: Two-target preemption game (adapted from Enders and Sandler, 2006)

If only one country attacks, it ends up with -2 (= 4-6). In such a case the other country gains free-rider benefits of 4 without having any costs. An engagement in preemption of both countries would lead to each of them gaining 2. Here the doubled benefit of 8 would be reduced by the cost of 6. This game, a Prisoners' Dilemma, has its Nash equilibrium in mutual inactivity. The dominant strategy is to remain at the status quo by doing nothing. This is a classic scenario involving a pure public good. The significant welfare loss presented by this example is also present when more countries enter the game (Enders and Sandler, 2006).

There is multiple reasons why governments have problems to address common concern collectively. For once, they often do not agree on who is a terrorist group or not. Hamas, for example, was not viewed as a terrorist organisation by a number of European countries for a while. Additionally, governments, because of their relative strength in terms of resources compared to terrorist groups, often consider themselves strong enough do deal with threats without appreciating the need for better coordinated measures. Another major reason for not cooperating enough is the fact that elected officials tend to think ahead only as far as the next election. In most cases keeping their autonomy seems to be more important for them than much needed international collaboration. Moreover, governments can change. Thus international agreements concerning transnational terrorism may be rather short-lived.

In contrast, terrorist groups often do not have those systematic problems working together. Although their goals and agendas may vary, they often share similar enemies and have a mutual understanding. As opposed to governments, cooperation between different groups might be more long lasting. They often have long-term goals and leaders change less regularly. Also their relative weakness compared to governments, forces them to pool resources. In the past, one could observe many joint operations by different terrorist groups. Left-wing radicals all over Europe had not just ties to each other, but also to several Palestinian groups. Basque and Irish terrorists have worked together as well. Al-Quaida is a network of radical Muslim organisations with branches all over the Muslim world (Enders and Sandler, 2006). The following table, Table 2, summarises the main differences between governments and terrorists when it comes to international cooperation.

Terrorists	Targeted Governments
- Target poor - Weak relative to adversary - Take a long-term viewpoint when interacting with other terrorist groups - Agree on common enemies - Address their collective action concerns - Can be restrained or unrestrained in their response - Non-hierarchical organization - Size furthers interests - Luck needed on occasion - Reasonably well informed about government's strength	- Target rich - Strong relative to adversary - Take a short-term viewpoint when interacting with other governments - Do not agree on common enemies - Do not address their collective action problems - Restrained in their response - Hierarchical organization - Size may hamper interests - Luck needed always - Not well informed about terrorists' strength

Table 2: Asymmetries between terrorists and targeted governments (Enders and Sandler, 2006: 144)

Right after outstanding events, such as 9/11, closer alliances are built and cooperation is improved. However, this effect is not very long lasting, as single countries put politics and their own interests before common goals. In order to be more effective in the fight against transnational terrorism, governments need to find a way to improve international cooperation. A collective approach of all countries facing the same threat by coordinating their efforts would increase the odds of successfully curtailing terrorism.

4. Costs and Economic Consequences of Terrorism

In the context of economic impacts of terrorist incidents, a number of different aspects – like material damage, direct costs, indirect costs, etc. – are of importance. There are a number of different aspects when it comes to economic impacts of terrorist incidents. The material damage caused by an attack and the effort to mitigate that damage right away are accounted as direct costs and can be seen right in the aftermath. According to the U.S. Bureau of Economic Analysis (2001) the damage done to equipment, structures and material on 9/11 added up to 16.2 billion U.S. dollars (Bureau of Economic Analysis, 2001). In addition the high death toll and the many injuries of these attacks lead to the issue of destroyed human capital, which is very hard to measure. However, in an interdependent economic world, terrorist incidents interfere with economic activities that are not directly affected either. In most cases, those indirect effects are very likely to outweigh the direct ones (Brück and Wickström, 2004). They include changes in several macroeconomic variables as well as repercussions on all kinds of industries and stock markets. The lives of private individuals are affected as well, which is also accounted as costs, all of which I will discuss in more detail in the course of this chapter. Another aspect that has to be taken into consideration is the response of governments to terrorist incidents (e.g. tighter security measures) as well as of all other agents (i.e. consumers and producers), which can impose additional costs on companies and individuals or influence the economy trough their behaviour.

In the following paragraphs I will present a brief overview of how the overall economy, financial markets, foreign trade and one specific industry, namely the tourism industry, are affected by terrorism. The utility effects for individuals are going to be discussed as well.

4.1. Macroeconomic Impacts

The overall effects of terrorism on the economy depend on a variety of circumstances, especially on the size of the economy and on whether terrorism in that particular country or region is prevalent or not. A big economy like the United States is more resilient than smaller ones. Because the U.S. economy is sufficiently diverse and there are relatively few attacks taking place on American soil, economic activities shift to unaffected sectors and therefore the impact of terrorist incidents can be absorbed. According to Robert Shapiro (2003), who served as an official in the Clinton administration, "even a huge terror strike is a blip in a vast economy like the United States'. The World Trade Center attack did not move the U.S. economy, as consumer spending and GDP accelerated strongly in the quarter immediately following the attack. Modern economies regularly absorb greater losses from bad weather and natural disasters—for example, the 1988 heat wave that took the lives of more than 5,000 Americans or the 1999 earthquake in Izmit, Turkey, that killed 17,000—without derailing". He continues to explain that in bigger countries, "where terrorism has been more occasional and local, the economic impact is modest, resembling ordinary crime". Therefore, as long as terrorists do not get hold of weapons of mass destruction, "any ambition to derail a large, advanced economy like ours will fail" (Shapiro, 2003). Terrorism leads to a substitution from more vulnerable sectors to safer ones, rather than damaging an entire macroeconomy. This argument is emphasised by the fact that the total costs of terrorism in the United States, including loss of life and property, lost growth of GDP and security expenses, are just about 0.3% of GDP (Enders and Sandler, 2006).

Enders and Sandler (2006) provide some evidence for the view that the United States recovered rather quickly from the 9/11 attacks. Figure 8 contains six panels, each of which showing the time path of one US economic variable during the period around 9/11. The third quarter of the year 2001, the period that contains the actual attacks, is represented by a vertical line that can be seen in each panel. Real GDP, as shown in panel 1, fell slightly in the third quarter of 2001. It had been quite constant throughout the year 2000 and started a sustained upward trend in the fourth quarter of 2001. Panel 2 indicates that industrial production had been falling for quite some time before 9/11 and started to increase in the beginning of 2002, due to strong growth in consumption. The consumption of durable goods jumped in the fourth quarter of 2001, as one can see in panel 3. Because the unemployment rate is a lagging indictor of economic activity, the fact that it experienced a period of steady growth before and jumped dramatically after 9/11, as shown in panel 4, does not suggest much. Panel 5 shows a sharp cut of the interest rate that is charged by banks for short-term loans to each other. This decrease of the federal funds rate is a reaction of the Federal Reserve to dramatically increased demand of liquidity, which was due to uncertainty in the days and weeks after 9/11. Much higher borrowing of banks directly from the Federal Reserve, which encouraged them to do so, increased liquidity additionally. Finally panel 6 illustrates that real disposable income grew sharply in the beginning of 2002. The initial drop right after the attacks did not become a long lasting trend. This was a result of tax cuts signed into law months before 9/11. The last two panels show that monetary and fiscal policy played a decisive role in absorbing economic affects of the terrorist attacks. Additional spending programmes by the government helped restoring confidence of businesses and consumers. By the end of the year 2001 consumer confidence had exceeded its level prior to 9/11 (Enders and Sandler, 2006).

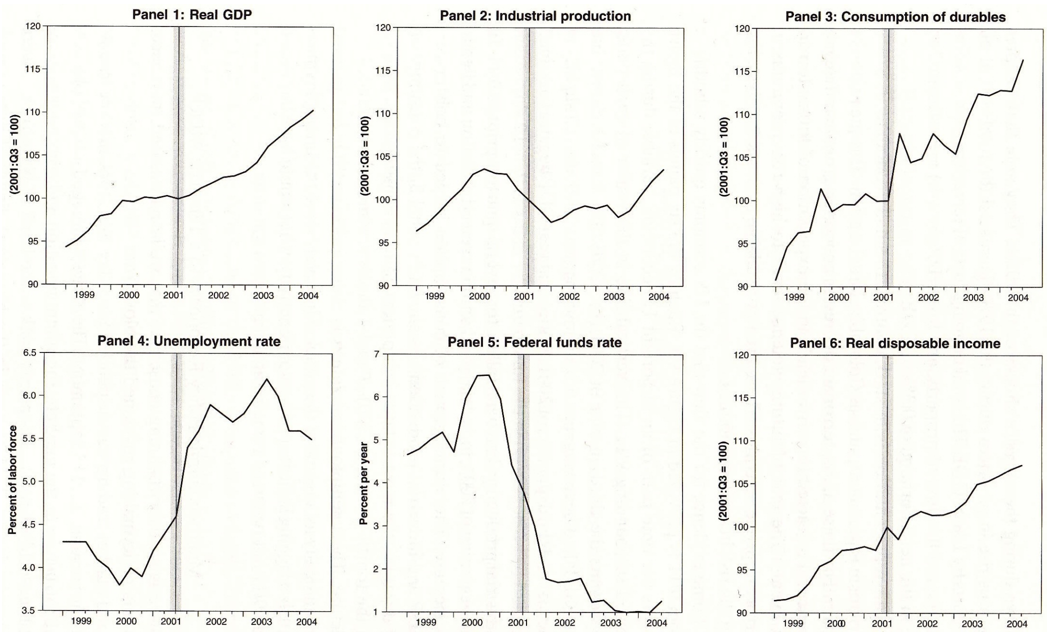

Figure 8: Macroeconomic variables and 9/11 (Enders and Sandler, 2006: 210)

All of this, of course, does not apply for smaller countries that have to suffer from terrorism on a more regular basis. Shapiro (2003) explains that terrorism raises fears of more violence, which leads to higher risk-premiums: “Investors demand a higher return to offset a marginal increase in the odds that violence will sink their investment, so overall investment slows as projects that can't meet the higher return fall by the wayside. In addition, fear of violence often induces firms to spend more on security—guards, fire walls, record storage, insurance—leaving less for other, more productive investments. These effects are greatest on small countries beset by protracted terrorist campaigns, in which no place seems safe from attack, and on small economies that depend on foreign capital. In Colombia, beset by narco-terrorism for 20 years, foreign capital fled long ago, and per-capita income is now 45 percent below the average for Latin America. Similarly, when religious violence raged through Belfast in the '80s and early '90s, Northern Ireland became the U.K.'s poorest region as industry and people migrated to the southern republic. But the economic damage is not necessarily permanent: As the violence abated in the mid-1990s, Northern Ireland began to recover. Israel is the other major example of a country where terrorists have significantly damaged a relatively small economy. The (...) intifada has created a wartime political and economic climate. The Bank of Israel estimates that intifada terrorism has cost Israel 4 percent of its GDP, as foreign investment and tourism have fallen sharply and security costs and budget deficits have soared“ (Shapiro, 2003). In addition, smaller countries do not have as many capacities as countries like the USA to diversify the risk to safer areas of their economies.

Enders and Sandler (2006) provide another illustrative example of a small country's economy suffering from terrorism. Yemen borders the Red Sea and the Arabian Sea, which is an ideal location for the shipping industry. Therefore its ports played a major role in the Middle East. In October 2000 terrorists attacked the American destroyer USS Cole, which was refuelling in the Yemeni port of Aden, with a motorboat full of explosives and killed seventeen people and injured thirty-nine. Two years later, in December 2002 another ship, the French oil tanker Limburg, was attacked. One crewmember was killed, twelve others were injured and thousands of barrels of oil were spilled into the sea. Those incidents led to an increase of insurance premiums by 300 % for shipping companies, which caused many of them to bypass Yemeni ports and head to competing facilities in neighbouring Oman and Djibouti. Because of the large decrease in port activity, the Yemeni economy is estimated to lose 3.8 million U.S. dollars per month as well as its major economic role in the region as a result of terrorist attacks (Enders and Sandler, 2006).

A number of empirical studies on the macroeconomic effects of terrorism in a variety of countries, regions and time spans have been conducted. While some of them focus on a specific country or region, others are pooling different countries, which – due to different levels of terrorism and structures of their economies or institutions – is problematic. These studies support the claim that comparatively small economies that have to deal with terrorism over a longer period of time, struggle with the consequences. Abadie and Gardeazabal (2003) show that GDP per capita in the Basque region of Spain decreased by 12 % during the 1970s and by 10 % during the 1980s and 1990s as a result of the terrorist campaign by separatist ETA, which started in the early 1970s. Prior to any conflict, the Basque country was among the three richest regions in Spain – in terms of GDP per capita – and dropped to sixth place as a consequence of the ETA-campaign. Furthermore the authors were able to observe a substantial drop in the number of companies engaging in business dealings in the Basque country after a cease-fire announced by the ETA collapsed in 2000 (Abadie and Gardeazabal, 2003).

In the case of Israel, Eckstein and Tsiddon (2004) use vector auto regression (VAR) methodology to examine the impact of terrorism on real GDP, exports, consumption and investment from 1980 through 2003. A weighted average of the number of Israeli casualties, injuries and incidents without fatalities is used as the measure of terrorism. The authors find that the effects within the single sectors are much larger than the overall effect, which is not a very long-lasting one. But they also conclude that under the assumption that all terrorism ceased, Israel would experience a substantial increase in real GDP, investment and trade benefits (Eckstein and Tsiddon, 2004).

While Araz-Takay et al. (2009) find that the Turkish economy is largely affected by terrorism, researchers, who use larger panels of countries, namely Blomberg et al. (2004) and Tavares (2004), who compares the impact of terrorism with natural disasters and financial crises, conclude that the effects terrorism has on the economy are relatively small (Araz-Takay et al., 2009, Blomberg et al., 2004 and Tavares, 2004). Thus it can be said that the overall macroeconomic costs of terrorism are relatively low, although single countries or industries – depending on their composition – might be more affected.

Table 3 provides a brief overview of studies concerning growth effects and their main results.

Study	Scope	Main Results
Abadie and Gardeazabal (2003)	Basque Country, ca. 1955-2000	Terrorist activity reduced per capita income. Inter alia, terrorism negatively influenced the performance of firms.
Gaibulloev and Sandler (2008)	18 European Countries, 1971-2004	Domestic terrorism has a small effect on growth by mainly increasing (unproductive) government spending. Transnational terrorism more strongly reduces growth by crowding out

		investment.
Araz-Takay et al. (2009)	Turkey, Quaterly Data 1987-2004	Terror has a large and negative impact on economic activity. This impact is stronger in times of economic expansion.
Blomberg et al. (2004a)	Unbalanced Panel of 177 Countries, 1968-2000	Terrorism reduces growth, but the effect is relatively small (e.g. compared to external war). Terrorism may reduce growth by fostering government spending.
Crain and Crain (2006)	Panel Data for 147 Countries, 1968-2002	Terrorism reduces economic growth and per capita income. Potential channels from terror to growth are reduced investment and tourism.
Tavares (2004)	Cross-Country Data, 1987-2001	Terrorism is not an important determinant of growth, once it is controlled for a number of factors (e.g. currency crises or natural disasters).
Eckstein and Tsiddon (2004)	Israel, Quarterly Data for 1980-2003	Terror reduces economic activity, e.g. by affecting consumption, investment and trade unfavourable.

Table 3: Empirical Evidence on the Growth Effects of Terrorism (Schneider et al., 2010a: 39-40)

4.2. Financial Markets

Similar results can be found when it comes to effects of terrorism on financial markets. "While the impacts of a large-scale singular event in a comparatively well-diversified capital and stock market may be relatively short lived and small, the impact of protracted terror events (and changes in terror risk due to changes in the political landscape), even if smaller in scale, in relatively less diversified

markets may create lasting negative impacts“ (Schneider et al., 2010a: 37). The only terrorist event that had a significant impact on the US stock market was 9/11, when even after six trading days markets showed abnormal negative returns. This could not be observed with all other terrorist attacks, even on the day the attacks happened (Chen and Siems, 2004).
In contrast, Eldor and Melnick (2004) show that the Israeli-Palestinian conflict reduced the stock market capitalisation in Israel substantially. Markets there not only react to suicide bombings, but also to counterterrorism measures by Israel (Eldor and Melnick, 2004 and Zussman and Zussman, 2006 in Schneider et al., 2010a).

4.3. International Trade

According to a study by Nitsch and Schumacher (2004), terrorism has a significant impact on bilateral trade flows. Their survey includes more than 200 countries and focuses on the period 1968 to 1979. The results suggest that countries affected by terrorism trade much less with each other than safe countries. Bilateral trade flows are reduced by 4 %, if the number of terrorist events doubles. This is a relatively strong economic effect (Nitsch and Schumacher, 2004 in Frey et al., 2004).

There are a number of reasons for foreign trade being affected by terrorism. Tighter security measures (e.g. on ports and airports) increase transaction costs. There is a significant risk of traded goods being destroyed by terrorism. Attacks on pipelines and oil tankers are just two examples for this. Additionally the increase in insecurity produced by terrorism leads to higher costs of doing business in general (Frey et al., 2004).

4.4. Tourism

Because tourism services provided by almost all countries can easily be substituted, concerned countries are „negatively affected by terrorist attacks to a

substantial extent“ (Frey et al., 2004: 7). This makes tourists an appealing target to terrorists, as seen in Luxor, Egypt in 1997, where about 60 foreign tourists were massacred by Egyptian Islamists and in Bali, an Indonesian island, in 2002, where a nightclub was bombed and about 200 tourists were killed. As Frey et al. (2004) put it: "The expected reactions from consumers make the bombing, shooting and kidnapping of tourists attractive strategies for terrorists who want to inflict economic damage, when pursuing their political goals" (Frey et al., 2004: 7).
The effect of terrorist attacks on the tourism industry has been examined by a number of authors. In countries, where tourism accounts for a big share of the economy, those effects are reflected in the overall economic impact of terrorism. But this specific industry is worthwhile to be examined separately. Enders and Sandler (1991) describe the relationship between international terrorism and tourism in Spain. By applying VAR methodology and using monthly data on terrorist incidents and tourists visiting Spain between 1970 and 1988, they conclude that one typical terrorist attack costs the country about 140000 foreign visitors. That means, that in 1988 1,5 times as many people would have visited Spanish destinations if there were no terrorist attacks (Enders and Sandler, 1991 in Frey et al., 2004). Other studies focus on the Israeli tourism market and how it is affected by terrorism (Fleischer and Buccola, 2002) or on repercussions of terrorism on other tourist destinations in the same area (Enders et al., 1992). Sloboda (2003) analyses the effect of terrorist attacks on US interests on US tourist receipts and US airline demand. He also estimates how the Gulf War in 1991 and anti-American attacks that accompanied it had an impact on tourism revenues (Frey et al., 2004). The effects of new, tighter security requirements on planes and airports – imposed after the 9/11 attacks in 2001 – on domestic airline demand in the USA are assessed by Ito and Lee (2004).

Another aspect of tourism being affected by terrorism is regional interdependencies. Terrorist attacks in one country could lead to potential tourists substituting their destination with a country in the same region. On the other hand, the so-called contagion effect could occur, leading tourists to avoid visiting an entire region because they may fear terrorism spilling over into previously uninvolved neighbouring countries. Both, this negative externality and the

substitution effect are detected by Drakos and Kutan (2003). By using monthly data from 1991 to 2000 they analyse how terrorism in each of three Mediterranean countries – Greece, Turkey and Israel – affects the market shares of the other two. They were able to show that both effects exist, although the negative externality is considerably stronger. While about 11% of aggregate loss in market shares stays in the region, about 89 % is flowing out of the group of destinations under consideration (Drakos and Kutan, 2003).
There is a similar result for continental Europe. Enders et al. (1992) found evidence for a contagion effect because this area "as a whole is much more negatively affected by terrorism than the sum of country-by-country would imply" (Enders et al., 1992 in Frey et al., 2004: 9).

Comparisons between studies are problematic. In all those studies mentioned above, the estimated impact of terrorism attacks on the tourism industry varies considerably. This is due to changes in the structures of the tourism industry as well as of terror campaigns that occur over time and across countries. It is important to differentiate between different kinds of terrorism attacks, the number of casualties and whether an attack happened in a rural or urban area (Frey et al., 2004).
Another significant difference within the literature concerns the time span between the attack and measurable impacts on the tourism economy. Fleischer and Buccola (2002) find immediate effects of terrorism on tourism in Israel while Enders et al. (1992) observe impacts in continental Europe occur only 18 months after a terrorist incident (Fleischer and Buccola, 2002, Enders et al., 1992). This is not only due to differences in the type of the incident and the structures of markets but also to the type of time-series used by the authors (Frey et al., 2004).

An accelerating factor for the influence of terrorism on decisions of tourists is the notion that people do not seem to react in a rational way to this kind of threat. They tend to predict worst-case scenarios (Viscusi and Zeckhauser, 2003) and do not focus on the probability of a terrorist attack occurring, but on its ferocity (Sunstein, 2003). Downes-Le Guen and Hoffman (1993) even found out that the risk of terrorism made a third of Americans they interviewed in 1989 not wanting to travel abroad at all (Downes-Le Guen and Hoffman, 1993).

Overall it can be said that potential host countries are negatively affected by terrorism in a fundamental way. Peoples' choice of tourist destination is systematically influenced by terrorism, which can hurt impacted countries substantially. Moreover, as Frey et al. specify, "the effect is long-lasting and has an impact on the demand for tourism in neighboring countries" (Frey et al., 2004: 10). Table 4 summarises the results of some studies concerning terrorist impacts 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 or terrorism cannot compensate for losses due to reduced international tourism.
Llorca-Vivero (2008)	Cross-Sectoral 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 secotr remains important as toursim flows are able to recupterate

		after negative shocks.
Pizam and Fleischer (2002)	Israel, Monthly Data 1991-2001	A hich frequency of terrorism is more dangerous to tourism flows thatn the severity of these attacks.
Drokos 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.

Table 4: Evidence on the Impact of Terrorism on Tourism (Schneider et al., 2010b: 25)

4.5. Effects on private individuals

A significant cost of terrorism is the impact it has on the every day lives of individuals. As stated earlier, one of the main objectives of terrorists is to influence a larger public beyond the immediate victims and stir anxiety among the population of a targeted society. Since fear, grief, mourning, anger and other emotions are highly subjective, those effects are difficult to measure. As security, or the absence of terrorism, is a public good provided by the government, it competes with other public services. Therefore all involved agents are interested in its valuation relative to other public or private goods. Once a government knows the costs of terrorism for its population, it is able to make better decisions on how to allocate its resources in order to deal with terrorism in the most effective way (Frey et al., 2009).

However, there are traditional methods in economics to measure preferences and value environmental quality and cultural heritage. Those approaches could be applied to terrorism as well. But according to Frey et al. (2004) they are not suitable to value the threat of terrorism – or public goods (or bads) in general – for a variety of reasons. The two most prominent techniques are the contingent valuation method, a stated preference method, and the hedonic market approach, which is a revealed preference method.

The former basically consists of a survey, where people are asked, how much they are willing to pay for a decrease of the number of terrorist events in a region. There are a variety of problems with this approach. It addresses hypothetical scenarios, puts the respondent in an unfamiliar situation and might lead him to give strategic answers. There are significant difficulties concerning the proper design of such a questionnaire as well.

The hedonic market approach relies on markets, particularly on the labour and housing markets, to reflect utility losses caused by terrorism. Employees must be paid higher wages, if they are ready to work in an environment plagued by terrorism. Similarly, the rents for land and housing in such a region must be significantly lower. The marginal willingness to accept a certain degree of terrorism is reflected by the marginal implicit compensations for living or working in a dangerous region. The biggest problem of this approach is its reliance on perfect markets, which must be in equilibrium and fully reflect all changes in the intensity and the amount of terrorist incidents. Additionally it requires functions, which are homogenous and twice differentiable.

However, as Frey et al. (2004) consider these two traditional methods as inapplicable to terrorism, they present a different approach. It is called life satisfaction approach and measures the effects of terrorism on people's subjective well-being. There are large surveys in many countries, where people are asked about their happiness or how satisfied they are with their lives in general. This subjective well-being can be used as a proxy for utility and public goods or bads can now be assessed in terms of utility. "By measuring the marginal utility of a public good or the marginal disutility of a public bad, as well as the marginal utility of income, the marginal rate of substitution between income and the public good can be calculated. This allows for the computation of relevant welfare measures for marginal and infra-marginal changes in the public good provision. We call this the life satisfaction approach" (Frey et al., 2004: 22). Democratic countries that are politically stable have always scored very high in these life-satisfaction tests, whereas people in unstable and violent countries have expressed a lower level of happiness. Political stability and the absence of political violence therefore seem to be closely related to subjective well-being.

In order to assess the cost of terrorism, Frey et al. (2004) applied the life satisfaction approach to the conflict in Northern Ireland. They combined the life satisfaction data from the Euro-Barometer Survey Series (1970-1999) with the number of deaths resulting from the Northern Ireland conflict (which includes all political violence and is not restricted to terrorism). By using a time-series analysis (for 1975 to 1998) and a cross-section analysis (by comparing the results for Northern Ireland with those of the rest of the United Kingdom and the Republic of Ireland, the authors conclude that the number of casualties due to the conflict has a statistically significant effect on general satisfaction reported in the survey. "This effect is about a tenth of the effect of being unemployed rather than employed. Thus, the indicator for terrorism is correlated with people's subjective well-being in a sizeable way" (Frey et al., 2004: 24).

Furthermore, they say that: „The life satisfaction approach has several important advantages over the approaches discussed so far in measuring people's utility losses due to terrorist activity. Contrary to contingent valuation surveys, this approach does not rely on asking people how they value a public good or an anti-terrorism policy. The hypothetical nature of these questions and the unfamiliar situation for the respondents are the principal reasons for most of the skepticism about, and problems concerning, the contingent valuation method. It is a demanding cognitive task, and superficial or socially desirable responses, without adequate consideration of the budget constraint or substitutes, can result. To correctly state one's own current level of life satisfaction, in contrast, is much less demanding and strategic responses are unlikely. Similarly, the stringent conditions of the approaches based on revealed preferences, like housing or labor market equilibrium in the case of the hedonic market approach, do not have to be met in order to evaluate welfare effects through the use of life satisfaction data" (Frey et al., 2004: 22, 23).

5. Conclusion

The variety of areas connected with terrorism, which can be analysed with the help of economic methods and approaches, is equally diverse as the range of different applicable economic tools. Empirical research methods, like time series analysis, are useful as well as various theoretical approaches. Rational-actor models, utility maximising frameworks, game theory, externalities and market failures are all instrumental in providing helpful insights concerning behaviour of all agents involved and giving policy recommendations. Furthermore, economists are enabled to assess and analyse the impact of terrorism on countries, industries and private individuals. Together with contributions from other scientific disciplines, such as sociology, psychology or political science, this provides a deeper knowledge and better understanding about terrorism.

The approaches presented in the chapter "Counterterrorism and Interaction" highlight how market failures dictate the outcomes of anti-terrorism policies. Game theory can explain why governments tend to rely on each other. Similarly, it can be used to find out whether a government should apply a defensive or proactive measure against a certain threat or which strategy terrorists might choose in response to a specific policy implemented by the authorities.

One of the things the economic approach taught us was that the most popular method to fight terrorism – deterrence – does not seem to be fit as the sole course of action, since it might increase the terrorists' marginal benefits and therefore spark more terrorism. Especially the limitation of civil rights is a counterproductive strategy. While it might help to find some terrorists, it not only diminishes democracy but also constitutes a success for terrorists because one of their goals is to mess with the way of life of the targeted society. Thus, it might even serve as an incentive to engage in additional terrorism. Some of the proposed alternative anti-terrorism policies do not only offer credible solutions in the struggle against terrorism but also have positive side effects. Decentralisation, for example, strengthens democracy and liberalism, as opposed to many deterrence measures. Another alternative method presented in chapter 3, the limitation of attention towards terrorists by denying them recognition by means of a vague information policy or by restricting the media, seems rather problematic. The media itself plays an important role in both, fostering and countering terrorism. Terrorists often use the media as a tool. It helps to spread propaganda, get global attention for their cause and create anxiety in a large part of the targeted population. Additionally, media coverage of certain events might inspire others to copy successful terrorist tactics. Effects like these “can lead to cycles in terrorist attacks as successful methods disseminate rapidly and failures quickly lead to curtailing planned attacks” (Ender and Sandler, 2006: 38). Applying empirical methods can identify these cycles. Some terrorist groups use the media to depict responses by governments as brutal in order to gain public support. Hamas and Hezbollah have used this tactic to turn world opinion against Israel. The media can also be helpful in efforts to counter terrorism. They can inform the public about threats, create a forum of discussion in order to get a better understanding of the situation, expose the brutality and hypocrisy of terrorists so that they lose support, and provide a platform for the government to address the public in order to counter charges made by terrorists. Moreover, releasing pictures of known terrorists might help to find and prosecute them (Enders and Sandler, 2006). In any case, limiting the media’s ability to report freely would be a danger to the very core of democracy. This – similarly to the limitation of civil rights – could be seen as a success for terrorists. Non-democratic countries, which are less inhibited to limitation of civil rights and the media, might be successful in fighting – what they regard as – terrorists. However, according to life-satisfaction-surveys people in such countries are in general less happy or less satisfied with their lives than people in stable democracies (Frey et al., 2004).

As already stated, empirical methods are helpful to identify cycles in terrorist attacks. In doing so, one can assess whether a drop in the numbers of a certain modus operandi or in attacks in general is due to implemented policies or a “natural decline” during a cycle. This might also help to predict certain developments in the future. Econometrics is also used to determine the costs of terrorism imposed on countries or industries. In order to find out the effect terrorism has on the personal level, traditional methods such as the hedonic market approach and the contingent valuation method are less adequate than the life satisfaction approach, a method developed by Frey et al. (2004). As described in the chapter "Costs and Economic Consequences of Terrorism", time series analysis is used in combination with life satisfaction data to assess the impact of terrorism on the well being of individuals.

There are several shortcomings regarding the economic analysis of terrorism. Obviously, economics is not capable of addressing every issue concerning terrorism or explaining this phenomenon by itself. As stated above, other scientific disciplines are needed to cover this topic extensively. Psychological and social phenomena that lead to suicide bombings are one example of issues that cannot be addressed by economics. Moreover, there are fundamental imperfections within the economic approach as well. It is, for example, almost impossible to accurately determine all indirect costs of terrorism. They need to be estimated using complicated, often imprecise techniques. In addition, the data, which would be needed to back up some theoretical propositions, simply does not exist, especially when it comes to methods of countering terrorism.

This thesis can be seen as an attempt to give an overview of possible strategies and methods to better understand terrorism from an economic perspective. There are several limitations regarding this attempt. Since this issue is not yet established in mainstream economics, the available literature is limited. Different authors cover different aspects of terrorism making it difficult to find their works through a simple, non-systematic literature research. Furthermore, authors use different composures of data and different methods of analysis, therefore, it is often difficult to compare results and draw general conclusions.

In order to improve this approach, future research should focus on collecting data about terrorism in democratic and non-democratic countries, trying to identify the optimal choice between defensive and proactive measures against terrorism, modelling terrorist campaigns in order to find out why attacks are composed in a certain way or analysing the dynamic interactions with regard to governments and their quest to batter terrorist groups versus organisations trying to escape those attempts and reaching their goals.

Although economics has already shed light on all kinds of issues concerning terrorism, there is still a long way to go in order to be able to entirely grasp its complexity.

6. References

Abadie, Alberto and Javier Gardeazabal (2003). *The Economic Costs of Conflict: A Case Study of the Basque Country*. American Economic Review 93 (1): 113-132.

Alexander, Dean C. and Yonah Alexander (2002). *Terrorism and Business: The Impact of September 11, 2001*. Transnational Publishers.

Aly, Hassan Y. and Mark C. Strazicich (2000). *Terrorism and Tourism: Is the impact permanent or transitory? Time series evidence from some MENA countries*. Ohio State University.

Araz-Takay, Bahar, K. Peren Arin and Tolga Omay (2009). *The Endogenous and Non-Linear Relationship Between Terrorism and Economic Performance: Turkish Evidence*. Defence and Peace Economics 20 (1): 1-10.

Blomberg, S. Brock, Gregory D. Hess and Athanasios Orphanides (2004). *The Macroeconomic Consequences of Terrorism*. Journal of Monetary Economics 51 (5): 1007-1032.

Boswell, Christina (2008). *Combining Economics and Sociology in Migration Theory*. Journal of Ethnic and Migration Studies 34(4): 549-566.

Brück, Tilman and Bengt-Arne Wickström (2004). *The Economic Consequences of Terror: A Brief Survey*. HiCN Working Paper 03. Brighton: University of Sussex

Chen, Andrew H. and Thomas F. Siems (2004). *The Effects of Terrorism on Global Capital Markets*. European Journal of Political Economy 20(2): 349-366.

Crain, Nicole V. and W. Marc Crain (2006). *Terrorized Economies*. Public Choice 128: 317-349.

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

Drakos, Konstantinos and Ali M. Kutan (2003). *Regional Effects of Terrorism on Tourism in Three Mediterranean Countries*. Journal of Conflict Resolution 47(5): 621-641.

Eckstein, Zvi and Daniel Tsiddon (2004). *Macroeconomic Consequences of Terror: Theory and the Case of Israel*. Journal of Monetary Economics 51 (5): 971-1002.

Eldor, Rafi and Rafi Melnick (2004). *Financial Markets and Terrorism*. European Journal of Political Economy 20 (2): 367-386.

Enders, Walter and Todd Sandler (1991). *Causality between Transnational Terrorism and Tourism: The Case of Spain*. Terrorism 14(1): 49-58.

Enders, Walter and Todd Sandler (2006). *The Political Economy of Terrorism*. New York: Cambridge University Press.

Enders, Walter, Todd Sandler and Gerald F. Parise (1992). *An Econometric Analysis of the Impact of Terrorism on Tourism*. Kyklos 45(4): 531-554.

Eye on the UN (2011). http://www.eyeontheun.org/facts.asp?1=1&p=61

accessed 22 November 2011

Fleischer, Aliza and Steven Buccola (2002). *War, Terror, and the Tourism Market in Israel.* Applied Economics 34(11): 1335-1343.

Frey, Bruno S. (1990), *Ökonomie ist Sozialwissenschaft.* München: Vahlen

Frey, Bruno S. and Simon Luechinger (2002a). *Terrorism: Deterrence May Backfire.* Working Paper No.136. Zurich: University of Zurich.

Frey, Bruno S. and Simon Luechinger (2002b). *How to Fight Terrorism: Alternatives to Deterrence*. Working Paper No. 137. Zurich: University of Zurich.

Frey, Bruno S. and Simon Luechinger (2004). *Decentralization as a disincentive for terror*. European Journal of Political Economy 20: 509-515.

Frey, Bruno S., Simon Luechinger and Alois Stutzer (2004). *Calculating Tragedy: Assesing the Cost of Terrorism.* Working Paper No. 205. Zurich: Universitiy of Zurich

Frey, Bruno S., Simon Luechinger and Alois Stutzer (2009). *The life satisfaction approach to valuing public goods: The case of terrorism*. Public Choice 138: 317-345.

Gaibulloev, Khusrav and Todd Sandler (2008). *Growth Consequences of Terrorism in Western Europe*. Kyklos 61 (3): 411-424.

Hardin, Russel (2002). *The Crippled Epistemology of Extremism*. In Albert Breton, Gianluigi Galeotti, Pierre Salmon, and Ronald Wintrobe, eds., *Political Extremism and Rationality*, Cambridge: Cambridge University Press: 3-22.

Ito, Harumi and Darin Lee (2004). *Assessing the Impact of the September 11 Terrorist Attacks on U.S. Airline Demand*. Journal of Economics and Business, forthcoming.

Landes, William M. (1978). *An Economic Study of US Aircraft Hijackings*, 1961-1976. Journal of Law and Economics, 21(1): 1-31.

Laqueur, Walter (ed.) (1978). *The Terrorism Reader: A Historical Anthology*. New York: New American Library.

Llorca-Vivero, Rafael (2008). *Terrorism and international tourism: New evidence*. Defence and Peace Economics 19 (2): 169-188.

Nitsch, Volker and Dieter Schumacher (2004). *Terrorism and International Trade: An Empirical Investigation*. European Journal of Political Economy 20 (2): 423-433.

Pizam, Abraham and Aliza Fleischer (2002). *Severity versus Frequency of Acts of Terrorism: Which Has a Larger Impact on Tourism Demand?*. Journal of Travel Research 40 (3): 337-339.

Sandler, Todd and Walter Enders (2004). *An Economic Perspective on Transnational Terrorism*. European Journal of Political Economy 20(2): 301-316.

Sandler, Todd and Walter Enders (2005). *Transnational Terrorism: An Economic Analysis.*

Schneider, Friedrich, Tilman Brück and Daniel Meierrieks (2010a). *The Economics of Terrorism and Counter-Terrorism (Part I)*. CESifo Working Paper No. 3011

Schneider, Friedrich, Tilman Brück and Daniel Meierrieks (2010b). *The Economics of Terrorism and Counter-Terrorism (Part II)*. Berlin: DIW

Shapiro, Robert (2003). *Al-Qaida and the GDP: How Much Would Terrorism Damage the U.S. Economy? Less than You'd Expect*.

Slate,(http://www.slate.com/articles/business/the_dismal_science/2003/02/alqaida_and_the_gdp.html),

accessed 7 December 2011

Sloboda, Brian W. (2003). *Assessing the Effects of Terrorism on Tourism by Use of Time Series Methods*. Tourism Economics 9(2): 179-190.

Sunstein, Cass R. (2003). *Terrorism and Probability Neglect*. Journal of Risk and

Uncertainty 26(2-3): 121-136.

Tavares, Jose (2004). *The Open Society Assesses its Enemies: Shocks, Disasters and Terrorist Attacks*. Journal of Monetary Economics 51 (5): 1039-1070.

United Nations. *Panel Report*. http://www.un.org/News/dh/infocus/terrorism/sg%20high-level%20panel%20report-terrorism.htm accessed 22 November 2011

United States Bureau of Economic Analysis (2001). *Business Situation. Survey of Current Business*. Washington D.C.: United States Department of Commerce

United States Department of Defense (2011). *Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms*. Washington D.C.: Department of Defense.

United States Department of Justice and Federal Bureau of Investigation (2005). *Terrorism 2002-2005*. Washington D.C.: United States Department of Justice.

United States Department of State (2010). *Country Reports on Terrorism 2010*. Washigton D.C.: United States Department of State.

Viscusi, W. Kip and Richard J. Zeckhauser (2003). *Sacrificing Civil Liberties to Reduce Terrorism Risks*. Journal of Risk and Uncertainty 26(2-3): 99-120.

Zussman, Asaf and Noam Zussman (2006). *Assassinations: Evaluating the Effectiveness of an Israeli Counterterrorism Policy Using Stock Market Data*. Journal of Economic Perspectives 20 (2): 193–206.

A. English Summary

This thesis aims at determining, what additional insights economic methods and approaches can contribute to the analysis of terrorism. After an economic perspective to systematically examining and predicting human behaviour is introduced, different kinds and definitions of terrorism, including accompanying controversies, are being discussed. Different methods and ways of fighting terrorism are analysed and challenged with the help of economic models and concepts, including external effects, public goods and rational choice models. Furthermore, some alternative approaches to countering terrorism are presented. By applying game theory and the concept of market failure, the lack of international cooperation in fighting a common enemy is discussed.

In addition, this thesis involves an examination of the effects terrorism has on different areas of the economy. The macro level is taken into account as well as specific sectors and industries. For this purpose, studies with different empirical methods are examined. In order to measure the impact terrorism has on a non-economic personal level, a new approach to addressing effects on individuals is presented as well.

Finally, some concluding remarks, involving advantages, shortcomings, and future research questions regarding this approach, are offered.

B. Deutsche Zusammenfassung

Diese Diplomarbeit geht der Frage nach, welche Erkenntnisse die Zugänge und Methoden der Volkswirtschaftslehre zu der Analyse von Terrorismus beitragen können. Nachdem zunächst ein ökonomischer Ansatz eingeführt wird, mit dessen Hilfe das Verhalten von Individuen systematisch betrachtet und vorhergesagt werden kann, wird in weiterer Folge zwischen verschiedenen Arten des Terrorismus unterschieden und auf die Problematik einer genauen Definition dieses Phänomens eingegangen. Mit Hilfe von ökonomischen Modellen und Konzepten, wie Externalitäten, öffentlichen Gütern und Rational Choice Modellen, werden verschiedene Methoden der Terrorismusbekämpfung genauer betrachtet und hinterfragt, sowie einige alternative Ansätze vorgestellt. Außerdem wird – unter Anwendung von Spieltheorie und der Theorie des Marktversagens – der Frage nachgegangen, warum es keine ausreichende internationale Kooperation in den Bemühungen, einen geneinsamen Feind zu bekämpfen, gibt. Anschließend wird auf Auswirkungen des Terrorismus auf verschiedene Bereiche der Wirtschaft, bis hin zu privaten Haushalten und einzelnen Individuen, eingegangen. Zu diesem Zweck werden Studien mit verschiedenen empirischen Methoden betrachtet und – um auch nicht-ökonomische Effekte im persönlichen Bereich messen zu können – ein neuer Ansatz für die Analyse des individuellen Wohlbefindens vorgestellt. Die Schlussfolgerungen beinhalten eine Auseinandersetzung mit Stärken und Schwächen des ökonomischen Ansatzes und geben einen Anstoß für zukünftige Forschungsfragen in diesem Bereich.

C. Curriculum Vitae

Personal Information

Name	Daniel Kon
Date and place of birth	22nd June 1984, Vienna
Nationality	Austrian

Employment History

Feb. 2012 - present	SMC University Research Collaborator
March 2011 – May 2011	Ludwig Boltzmann Institute – Health Promotion Research Contribution to research project “Gesundheit hat kein Alter”
Dec. 2003 – Sept. 2011	Forum against Antisemitism Voluntary activity
Sept. 2009 – Dec. 2009	IKG Vienna Administrative activities
July 2007 – Jan. 2009	Eurocontact Public Affairs GmbH Media monitoring, project documentation
Oct. 2004 – June 2006	Sunshine Enterprises Assistance in management of events
June 2003 – May 2004	Sanatorium Maimonides Zentrum Civilian Service
Feb. 2003 – May 2003	Jewish Museum Vienna Archives

Education

Feb. 2009 – June 2009	Universiteit van Amsterdam, Netherlands Participation in Erasmus exchange programme
Oct. 2004 – Feb. 2012	Study of Economics at the University of Vienna
1994 – 2002	Secondary Education: GRG Stubenbastei, Vienna