Working Paper No. 285

Blood and Ink! The Common-Interest-Game Between Terrorists and the Media

Bruno S. Frey and Dominik Rohner

April 2006

Blood and Ink! The Common-Interest-Game Between Terrorists and the Media[*]

Bruno S. Frey†   Dominic Rohner‡

(10 March 2006)

Abstract:

It has often been pointed out in the literature that a symbiotic relationship exists between terrorist groups and the media. As yet, however, no formal model has been built based on this issue and only very little empirical research has been done in this field. The present contribution builds a simple game theoretic model, focussing on the social interactions between terrorists and the media. The model has features of a common-interest-game and results in multiple equilibria. After a discussion of the policy implications of the model, an empirical analysis is performed. Using newspaper coverage, terror incidents and terror fatalities data, it is shown that media attention and terrorism do mutually Granger cause each other, as predicted by the model. Moreover, it is explained why terror attacks tend to be "bloodier" in developing countries than in Europe and the United States.

Blood and Ink! The Common-Interest-Game Between Terrorists and the Media

1. Terrorism and the Media Are Symbiotic

Recent history has provided plenty of examples of mutually beneficial relationships between terrorist organisations and the media. The hostage taking by Palestinian terrorists at the 1972 Munich Olympics, the hijacking of TWA flight 847 by Lebanese terrorists in 1985, or the terrorist attack on New York's twin towers on 9/11/2001 were all mediated mega-events, where terrorists deliberately wanted the attention of the public and where the media benefited from record sales and huge audiences. The more recent terrorist attacks on public transport services in Madrid in 2004 and in London in 2005 also follow the same pattern.

It appears that political extremists employ terror as a communication strategy, and that they deliberately choose their targets and their timing in order to maximise media attention. Most of the time, terror attacks take place in big cities with a high density of press agencies. Similarly, terrorists tend to attack before or during big media events, such as elections, international summits like the G8-summit or the Olympic Games. As once expressed by a leader of the terrorist organisation "United Red Army": "There is no other way for us. Violent actions … are shocking. We want to shock people, everywhere … . It is our way of communicating with the people" (see McKnight, 1974: 168).

Obviously, the media also benefit from the public's eagerness to obtain information about terrorist attacks. At least for sensationalist TV channels and tabloid-newspapers, the fear and fascination generated by terrorism and political extremism is a substantial part of their business.

The relationship between terrorists and the media has received little attention in the literature. Among the scholars focussing on this issue, almost all agree that a symbiotic relationship exists between terrorists and the media. Several contributions have discussed this symbiotic relationship qualitatively with the help of case study evidence (Frey, 1988; Hoffman, 1998; Wilkinson, 2000; Frey, 2004).

Very few econometric studies have been performed specifically focussing on whether the media actually increase the risk of terrorism. An interesting article by Nelson and Scott (1992) assesses empirically whether media coverage causes terrorism for the time period 1968-1984, and arrives at the conclusion that this is not the case. In the empirical part of our contribution, we will test, using more recent data, whether this conclusion still holds in today's more globalised and media-covered world. Another important empirical paper has been written by Schbley (2004), who analyses the impact of media on the propensity of Muslim zealots for terrorism. Analysing interviews with 2619 individuals, it is found that a lot of know-how on how to organise and execute a terrorist attack is transmitted by the media.

Some other articles put emphasis on related phenomena, such as the psychological impact of the media coverage of terrorism on the public (Slone, 2000) and on the inaccuracy and non-representativity of the terrorism coverage of certain media (Delli Carpini and Williams, 1987; Crelinsten, 1997; Gentzkow and Shapiro, 2004).

However, it is striking that, even though anecdotal and statistical evidence seem to suggest that there is a link between terrorism and the media, almost no theoretical research has been done on this issue. One exception is an article by Scott (2001). But he focuses on the competition amongst different terrorist groups and does not consider the explicit interaction between media and terrorists.

We intend to fill this gap in the theoretical literature by building a simple game-theoretic model, which will have the main features of a coordination-game, or, more exactly, a common-interest-game. As the symbiotic relationship between terrorists and media is a

particular form of social interaction, a game-theoretic model is more appropriate than a traditional microeconomics model with independently maximising agents. In section 2 of our paper, a simple model of the relationship between terrorism and the media is built. Section 3 is devoted to comparative statistics, section 4 performs an empirical analysis and section 5 concludes.

2. A Model of the Interaction Between Terrorism and the Media

We consider a two-player static game, where the players consist of terrorists and the media. Terrorists have the choice between committing terror acts and following productive activities. Their (normalised) time constraint is expressed in equation (1).

(1) L+T=1

where T=time devoted to terrorist activities, L=time devoted to work.

The utility function of the terrorists, which are assumed to be an aggregate player, is displayed in equation (2). Their utility depends positively on the impact of the terrorist activity (first term on the right) and on the amount of productive work terrorists could alternatively engage in (second term on the right).

(2) $u_T = \alpha Q S T^\theta + \beta L$

where Q=share of the news of the media devoted to terrorism, S=level of sensationalism of the newspapers, with $0 \le S \le 1$, α, θ, β are positive parameters, $0 \le \theta \le 1$.

The marginal productivity of terror incidents on terrorists' utility is assumed to be decreasing ($U_T^T > 0$, $U_{TT}^T < 0$). Or, in other words, the higher the intensity of terror, the less impact and attention in the media an additional terrorist act receives.

Introducing the time constraint (1), the utility function (2) becomes:

(3) $u_T = \alpha QST^\theta + \beta(1 - T)$

As shown in equation (4), the value of the parameter α depends on several factors related to intrinsic and extrinsic motivation. The benefits of a terrorist act are increasing with the value accorded to fame f, power p, monetary compensation m and ideological (missionary) gains i.

(4) $\alpha = \alpha(f, p, m, i)$

with all first derivatives positive.

The media coverage of terrorism acts as a multiplier to the term representing the benefits from time devoted to terrorism in equation (3). With given preferences for fame, power, money and ideology, an increase in media coverage increases the terrorists' motivation by making them more famous, powerful, wealthy and ideologically influential. This "media multiplier" of terrorism benefits reflects on the one hand the amount of media coverage allocated to terrorist news Q, and on the other hand the extent of sensationalism S. The idea is that more sensationalist newspapers might focus more on catchy issues, such as terrorist leaders, rather than, for example, on a profound analysis of the underlying roots and problems in a given context. By assumption, terrorists are not only motivated by intrinsic factors, such

as ideology, but also place considerable emphasis on extrinsic motivation factors, such as fame, power or money. Sensationalist media coverage makes it easier for terrorist leaders to establish their terror organisation as a well-known "brand", which facilitates fund-raising and increases their notoriety. As a result, sensationalist type news fits the aims of terrorists better than a nuanced analysis of terrorism.

The media, which for simplicity are again represented as an aggregate player, face the choice between reporting about terrorism and covering other topics. Their so-called "space" constraint is represented by equation (5).

(5) Q+R=1

where R is the newspapers' share of reports on subjects other than terrorism.

The media benefit from terrorist news and from reports about other topics (equation (6)). The gains from terrorist news are increasing in the level of sensationalism. The idea here is that terrorism is a catchy subject from which the sensationalist boulevard press can benefit more than the serious press. Further, the more terrorist acts that are committed, the greater is people's interest in reports about terror. Thus, the benefits from terrorism coverage increase in T.

(6) $u_M = \chi TSQ^\rho + \delta R$

where χ, ρ, δ are positive parameters, with $0 \le \rho \le 1$.

Which level of sensationalism a given media company chooses depends on the preferred level of sensationalism of its target group of potential readers. In the present model, the media

are represented as an aggregate player and the preferences of the public are not modelled explicitly. Thus, the level of sensationalism can, for the sake of simplicity, be taken as exogenous to the model. It can be assumed that the overall aggregate level of sensationalism of the media is determined by factors, such as the educational level of the population (where education increases the preference for nuanced journalism with a great information content).

The share of news devoted to terrorism shows decreasing marginal returns ($U_Q^M > 0, U_{QQ}^M < 0$). In other words, if numerous articles have already focussed on a particular terrorist attack, subsequent supplementary articles receive less and less attention. This feature of the model is consistent with the "crowding"-result of Scott (2001).

Plugging the space constraint of the media (5) in their utility function (6), we obtain equation (7).

(7) $u_M = \chi T S Q^\rho + \delta(1 - Q)$

The first-order conditions for terrorists and the media can be used to find the respective reaction functions. Setting $\dfrac{\partial u_T}{\partial T}$ from equation (3) and $\dfrac{\partial u_M}{\partial Q}$ from equation (7) equal to zero, we obtain the reaction function for the terrorists described by equation (8) and the reaction function for the media expressed by equation (9).

(8) $T = (\dfrac{\alpha \theta S Q}{\beta})^{\frac{1}{1-\theta}}$

(9) $Q = (\dfrac{\chi \rho S T}{\delta})^{\frac{1}{1-\rho}}$

T and Q cannot exceed 1, as T is subject to the time constraint of the terrorists, and Q is subject to the space constraint of the media. Therefore, we have T=1 for $(\frac{\alpha\theta SQ}{\beta})^{\frac{1}{1-\theta}} > 1$ and similarly Q=1 for $(\frac{\chi\rho ST}{\delta})^{\frac{1}{1-\rho}} > 1$.

The two reaction functions for particular parameter values[1] are displayed in figure 1 with the time spent on terrorist acts T on the horizontal axis, and the share of news devoted to terrorism on the vertical axis. The black lines represent the reaction function of the terrorists T=T(Q), whereas the grey lines represent the reaction functions of the media Q=Q(T).

Figure 1: The reaction functions
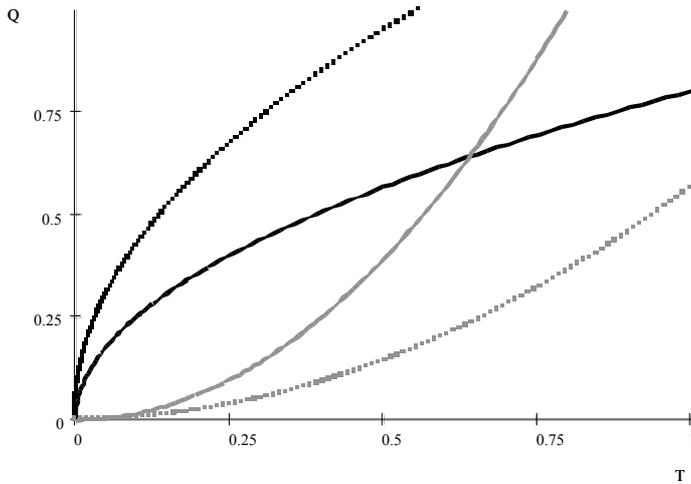
The present framework corresponds to a common-interest-game with (potentially) multiple equilibria, whereas for some parameter values at least one "good" and one "bad" equilibrium exists. The number of equilibria depends on the parameter values. In the case of the dotted reaction functions, there is only one stable "good" equilibrium, namely (0;0): No

---

[1] The solid reaction functions in figure 1 correspond to the following parameter values: θ =0.5, α =1, β =0.4, ρ =0.5, χ =1, δ =0.4, S=1. The dotted ones correspond to the following parameter values: θ =0.5, α =1, β =0.66, ρ =0.5, χ =1, δ =0.66, S=1.

terrorism occurs and newspapers do not write about terrorism. Another case (which is not displayed in figure 1) is when the reaction functions intersect twice at (0;0) and at (1;1).

As illustrated by the solid reaction functions, for some parameter values there are three equilibria. In addition to the two stable equilibria, (0;0) and (1;1), there is a third, unstable equilibrium for intermediate values of T and Q. For the particular parameter values chosen as an example, this equilibrium is at (0.64; 0.64). Figure 2 shows the basins of attraction and the stable and unstable equilibria for such a case.

Figure 2: The basins of attraction for the case with three equilibria
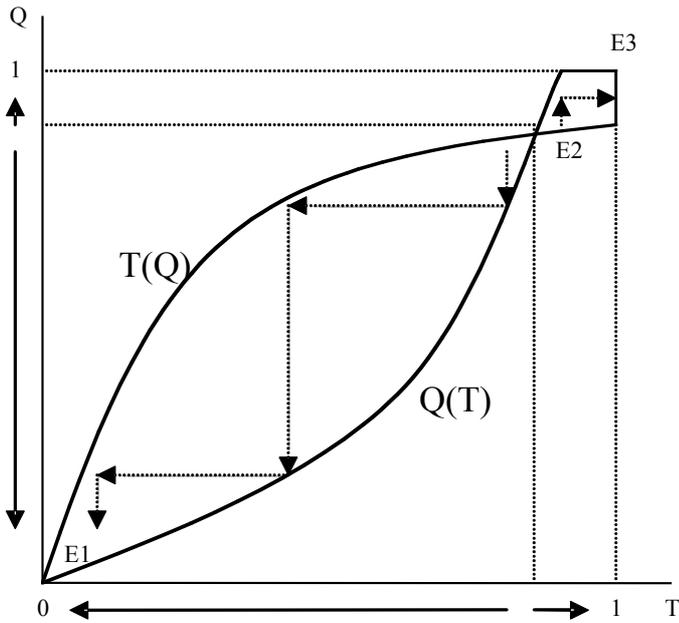
Equilibrium E2 is a saddle-point, and for points to the left and below E2, dynamic adjustment leads to equilibrium E1, whereas for points to the right and above E2, adjustment leads to equilibrium E3.

At first glance, the predictions of the "extreme" values of the stable equilibriums (0;0) and (1;1) seem unrealistic. However, if we allow for mixed strategies for different periods and regions, there is a continuous scale of probabilities of ending up at the high terrorism and high

media attention outcome (1;1) or of achieving the low terrorism and low media coverage situation (0;0). In other words, with mixed strategies our model is able to predict all kinds of intermediate levels of terrorism and media attention – just as we observe them in the real world.

3. Comparative Statistics

In this section, several policy options are discussed. First of all, some policies directly related to the media are examined.

One policy would be not to attribute terrorist acts to one specific group. This option has been discussed in Frey (1988, 2004) and in Frey and Lüchinger (2003). The refused recognition accorded to the terrorist incident would decrease the motivation of the terrorists by reducing their fame and power. This policy option can therefore be represented by a decrease in α in equation (4). This parameter enters the numerator of the terrorists' reaction function displayed in equation (8). As shown in equation (10), the first derivative of T with respect to α is positive, indicating that a decrease in α leads to a decrease in the percentage of time spent on terror attacks, *ceteris paribus*.

$$(10) \quad \frac{\partial T}{\partial \alpha} = (\frac{1}{1-\theta})(\frac{Q\alpha\theta S}{\beta})^{\frac{\theta}{1-\theta}}(\frac{Q\theta S}{\beta}) > 0$$

Accordingly, non-attribution of terrorist acts would lead to a rotation of the terrorists' reaction function towards the north-west in figure 1. As this increases the probability of the curves intersecting only once, and as it increases the basin of attraction of the (0;0) equilibrium, this policy leads to a higher probability of ending up at equilibrium (0;0), where no terrorism occurs and where the media do not write and broadcast about terrorism.

Another promising policy response to terrorism is represented by the legal or political support of quality media. Direct subsidies to particular newspapers may not be advisable, as measuring the quality of all national sources of media appears difficult and costly, and as direct subsidies could threaten the independence of the media. However, indirect policies, such as for example reduced charges for postal delivery of newspapers, would be conceivable. Such a measure is used in Switzerland, where above all "broadsheet"-newspapers are traditionally accepted and delivered by the post, and where "tabloids" are, in general, bought at a newspaper stand.

Such indirect support measures increase the incentives of newspapers to decrease their focus on sensationalist news, S. A lower S would rotate the terrorists' reaction function to the north-west, and would rotate the media's reaction function to the south-east in figure 1. Similarly, as in the case of the non-attribution policy, subsidising quality newspapers would increase the probability of ending up at a unique equilibrium of (0;0) and would at the same time increase the basin of attraction of (0;0). Thus, this policy also increases the likelihood of ending up in the "good" equilibrium (0;0).

Another way of decreasing the amount of sensationalist media coverage would be to increase educational spending. If additional education sharpens the faculties of critical thought and knowledge of politics, the interest for boulevard-journalism is decreased. The media have less incentive to focus on sensationalist news, and both reaction functions would rotate in the same way as for the policy of subsidising high-quality journalism described in the previous paragraph. Thus, educational spending increases the probability of achieving the low-terror outcome (0;0).

Other policies not directly linked to the media can also be discussed in the present framework. Decentralisation and federalism tend to increase the likelihood of a desirable outcome by decreasing the extrinsic motivation of the terrorists. As discussed in Frey (2004) and Frey and Lüchinger (2004), through decentralisation, the state can decrease its

vulnerability with respect to terrorism. The lower vulnerability decreases the power p of the terrorists and decreases the parameter α. As in the case of non-attribution policy, the lower α rotates the terrorists' reaction function towards the north-west, and thus increases the probability of ending up at (0;0).

Last but not least, better perspectives for terrorists to lead a better life without resorting to violence can lead to less terrorism. A better outside option increases the opportunity cost of terrorism. In the present framework, better outside options lead to a higher β. The terrorists' reaction function is rotated to the north-west in figure 1, which increases the likelihood of achieving (0;0). Possible ways of improving opportunities in life are to raise educational spending, provide subsidises for start-up companies, and build up a fairer and more meritocratic public administration etc.

4. Empirical Results

In order to test the theoretical model, the relationships between monthly data of terrorist incidents and casualties on the one hand, and of media coverage of terrorist attacks on the other hand, are analysed.

The data for the monthly number of terrorist incidents and victims are taken from the *National Memorial Institute for the Prevention of Terrorism (MIPT)*. For the purpose of our study, it is important to include both domestic and international terrorist acts, the time period being limited from January 1998 to June 2005; prior to 1998, no data on domestic terrorism is available.

It is impossible to consider the media coverage of terrorism by all newspapers and television channels in every country. We therefore consider internationally recognised newspapers as a proxy for the huge number of newspapers and television stations available around the world. In journalism and communication studies, the concept "quality newspaper"

has received considerable attention, even though a clear-cut definition and measurement is difficult (see Meyer and Kim, 2006). A well-regarded journalism scholar, Merrill (1999), has performed opinion polls in 1968 and 1999 among leaders in business, politics, science and culture to rank the world's highest-quality newspapers. For both waves of polls, the American *New York Times (NYT)* ranked first and the Swiss *Neue Zürcher Zeitung (NZZ)* ranked second. Our indicator of media coverage has been constructed, using editions of the NYT and the NZZ for the time period January 1998 to June 2005. We have simply counted the total number of times the expression "terrorism" or "Terrorismus" appeared during the month in question.

The NYT has also been chosen because it is one of the most influential high-quality newspapers in the United States, which has built a reputation for being as objective as possible. Moreover, the NYT is among the US-newspapers with a strong international orientation. It seems reasonable to assume that the NYT has a fairly unbiased focus. It is likely that it matters to terrorists what the citizens and politicians of the United States think. As the only remaining superpower of the world has a decisive impact on international and domestic politics in numerous countries, coverage by US-newspapers is likely to be one of the goals of terrorists in their quest to attract media attention.

The NZZ has been chosen to check the robustness of the results gained from the NYT because it is an internationally oriented high-quality newspaper, based in Continental Europe. Moreover, as it is edited in Switzerland, a neutral country without domestic terrorism, it is not biased towards certain kinds of particular terrorist incidents. It is reasonable to assume that the NZZ's coverage is quite unbiased and representative of the terrorism coverage of other internationally-oriented high-quality newspapers around the world.

Figure 3 plots both the number of terrorist fatalities and the media coverage of terrorism by the New York Times. There is an important structural break at the time of the terrorist attack aimed at the New York twin towers on 9/11/2001. After this event, both terrorist

activity and media coverage remain significantly higher. Following the theoretical framework developed in section 2, this corresponds with a move from the good to the bad equilibrium. Initially (1998-2001), there was a low-terror equilibrium with a parsimonious media coverage of terrorist acts. The attacks of 9/11 massively increased the media interest in terrorism and the level of media coverage has remained high, even though 9/11 could have been considered an exceptional catastrophe rather than the beginning of a new trend. Over time, however, the increased media coverage of terrorism has encouraged terrorists, and a trend of increasing terrorist activity has emerged. As a result, media coverage remained high. In 2004 and 2005, both the level of media coverage and terrorism were significantly higher than before 9/11.

Figure 3: Terrorist fatalities and media coverage (monthly data, 1998:01-2005:06)
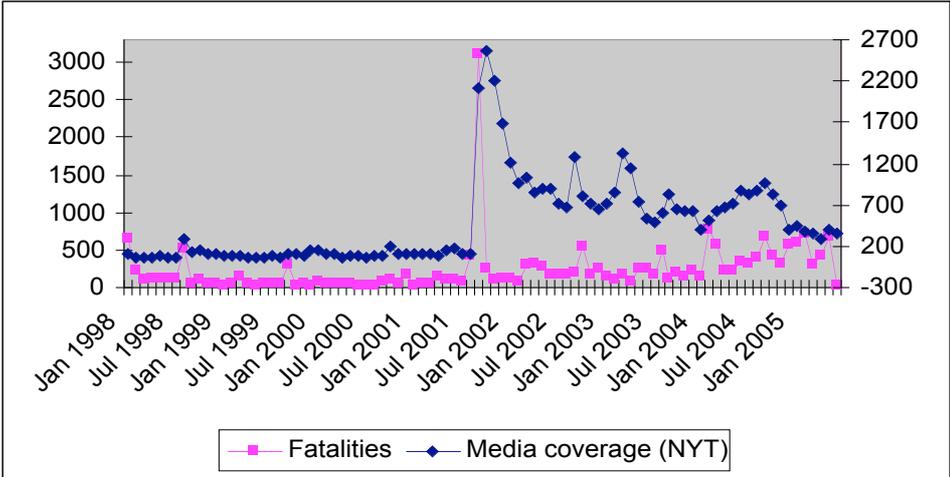
Source: MIPT, NYT. Remark: The scale to the left corresponds to the number of fatalities from terrorist attacks, whereas the scale to the right represents the media coverage of terrorism in the New York Times.

Granger causality tests are used to assess whether terrorist attacks Granger cause media attention and whether media coverage encourages terror, as suggested in our theoretical model. It is realistic to assume that the impact time of terror attacks and media coverage is relatively short. An impact time of a quarter of a year seems reasonable. Therefore, we perform Granger causality tests with 3 lags.

The Granger causality test between fatalities and the media coverage of terrorism by the NYT is displayed in table 1. The null hypothesis of fatalities not causing (in the Granger sense) media coverage of terror by the NYT is rejected at a level of confidence of 99%. In other words, at a level of confidence of 99%, terror fatalities cause the media coverage of terrorism by the NYT, according to the definition of Granger causality. Similarly, the media attention of the NYT causes terrorist fatalities at a level of confidence of 95%.

Table 1: Granger causality tests for worldwide terror fatalities and media coverage of terrorism by the NYT

Pairwise Granger Causality Tests
Sample: 1998:01 2005:06
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Probability
NYT coverage does not Granger Cause FATALITIES	87	3.557	0.018
FATALITIES does not Granger Cause NYT coverage		27.441	2.651 e-12

This clear result for terrorism and media attention causing each other is robust with respect to different lag lengths for the coverage by the NYT. The bilateral causality is supported using data from the NZZ media coverage of terrorism. This conclusion is robust with respect to the use of a quality newspaper from Continental Europe, such as the NZZ, rather than a US-newspaper like the NYT[2].

Our findings for data from 1998-2005 contrast with the results of Nelson and Scott (1992)'s study, which used data on terrorism and media coverage from 1968-1984. They focus as well on coverage by the NYT as proxy for media coverage. One potential explanation for differences would be that, in their study, terrorism data was provided by ITERATE2, whereas our data was provided by the *National Memorial Institute for the*

---

[2] In order to limit the number of tables and to make the present article as reader-friendly as possible, we have renounced the idea of displaying and discussing the empirical results for the NZZ coverage on terrorism and for the NYT coverage on terrorism in Western Europe and the United States in detail. However, we would be happy to share our data and results with other scholars after publication.

Prevention of Terrorism. However, in our view, it is much more likely that the underlying reason for the different results is that the world has changed in the last two decades. Our world has become increasingly globalised and so has international terrorism. In today's world, the media play an extremely important role and the world's leading newspapers are read all over the planet, both as the printed edition and the online edition. Therefore, the possibility of gaining media attention can trigger terrorism more than ever.

We have tested whether fatalities in Western Europe and the United States matter more for the attention of the NYT than fatalities in other parts of the world, such as for example Africa. We find that the F-statistics for both directions of Granger causality are even higher for fatalities in Western Europe and the United States than for fatalities worldwide. The Granger causality relation is significant in both directions at a level of confidence of 99%. Each terror victim in Western democracies receives more media attention from the NYT than a similar death in a developing country. Thus, media coverage of terrorism by the NYT has more appeal for terrorist groups operating in Western Europe and the USA rather than in developing countries. This bias in the media coverage towards terror attacks in Western democracies is also found for the NZZ.

It would be interesting to know whether this result also holds for terror incidents (rather than fatalities) and media coverage by the NYT. There seems to be only a weak bilateral causality relationship between the number of terror incidents and media coverage. However, this relationship is stronger for terrorist incidents in Western Europe and the United States. As shown in table 2, terror incidents in Western Europe and the United States cause (in the Granger sense) media coverage by the NYT at a level of confidence of 95%. Similarly, media coverage of terrorism by the NYT causes terrorist incidents in Western Europe and the USA at a level of confidence of 95%. Again, this result is robust with respect to taking different lag lengths, or to using media coverage in the NZZ rather than in the NYT. In the case of the NZZ, the bilateral Granger causality result is also stronger for terror incidents in Western

Europe and the USA than for worldwide terrorist incidents, and the Granger causality is also statistically significant in both directions and for different lag lengths.

Table 2: Granger causality tests for terror incidents in Western Europe and the United States and media coverage of terrorism by the NYT

Pairwise Granger Causality Tests
Sample: 1998:01 2005:06
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Probability
NYT coverage does not Granger Cause INCEUUS	87	2.78595	0.04604
INCEUUS does not Granger Cause NYT coverage		3.20924	0.0274

These results suggest that even high-quality newspapers like the NYT and the NZZ focus more on Western countries and under-report terrorist acts in developing countries. For the number of fatalities, the media's focus on Western Europe and the USA is less pronounced than for the number of incidents, where the NYT and the NZZ appear to be mostly interested in terrorist attacks in Western countries. In other words, to make it into the news, terrorists operating in Western countries can commit some minor terror incident with few fatalities, whereas terrorists in developing countries need to "produce" a lot of blood to attract the attention of the Western media.

As predicted by our model, terrorists may be assumed to adapt their terror strategy with respect to media behaviour. The terrorists' main goal is to obtain media attention to expose their ideology. As Western media might only cover terrorism in developing countries if a high number of fatalities are involved, terrorist attacks in developing countries should tend to be bloodier. Figure 4 shows that this is indeed the case. The attacks of 9/11, being a so far unique event with a large number of deaths, are excluded as outlier from the data used in figure 4. This figure clearly reveals that, in North America and in Western Europe, terror attacks tend to involve less fatalities and injuries, whereas in developing countries the number of injuries

and deaths per terror incident is much higher. Especially in Africa, the most ignored continent in terms of media coverage, terrorism shows a worrying tendency towards brutality and bloodiness. More than five people die and over twenty are injured in an average terror incident.

Figure 4: Ratio between fatalities, injuries and incidents for different regions
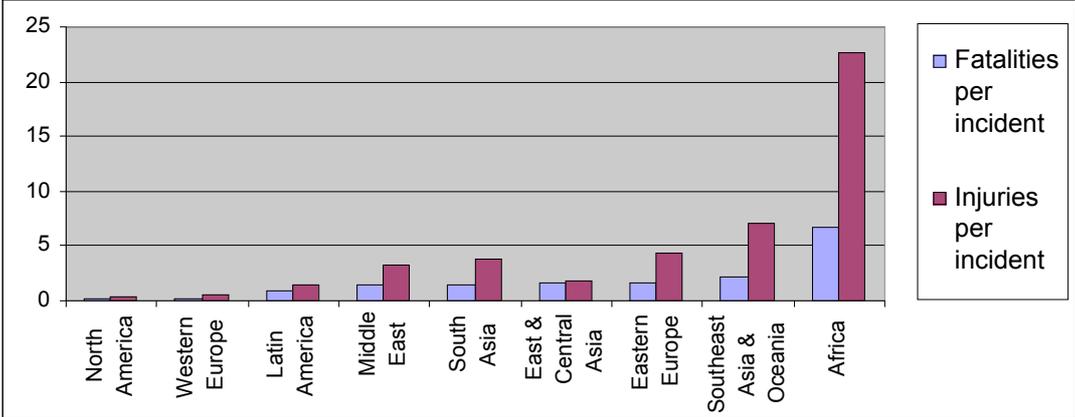
Source: MIPT. Remark: As an outlier, the terror attack on the USA on 9/11 has been excluded.

The empirical analysis presented implies a strong symbiotic relationship between the media and terrorists. The Granger causality analysis supports the notion that the causality goes in both directions. Analysing this issue in a game theory framework, rather than by traditional microeconomic models with independently maximising agents, is therefore desirable. Models ignoring social interaction would bear the risk of only capturing one direction of causality and not emphasising the strategic complementarities between the players.

5. Conclusion

The present contribution emphasises the symbiotic relationship between terrorism and the media. Terrorist attacks are a particular form of communication by terrorist groups. The

media are used as a platform for securing a broad dissemination of the terrorists' ideology. The media benefit from terrorism, as reports of terror attacks increase newspaper sales and the number of television viewers. There is a common-interest game, whereby both the media and terrorists benefit from terrorist incidents and where both parties adjust their actions according to the actions of their opponent.

The first part of the paper formalises this intuition with the help of a simple common-interest game. Terrorists have the choice of how much of their time they want to dedicate to terrorist activities. The media can choose how much of their news space they want to use for reporting on terrorism. Following the parameter values, one, two or three equilibriums were found. The extreme cases of very high and very low levels of terrorism and media coverage were both stable, whereas the intermediate equilibrium was unstable.

The analysis allows us to draw policy recommendations. Avoiding, as far as possible, to attribute terrorist attacks to particular groups and subsidise (indirectly) high quality journalism have been found to increase the likelihood of a low terrorism outcome. Further policy options, such as increased educational spending, more decentralisation and better perspectives for living a satisfying, law-abiding life could also decrease the risk of terrorism.

The empirical analysis of the media coverage of terrorism, terror incidents and fatalities in the *New York Times* and in the *Neue Zürcher Zeitung* suggests that terrorism and media coverage of terrorism cause each other in the Granger sense of the word. This result is consistent with the predictions of our game theoretic model. It remains remarkably robust to various changes, such as different lag lengths, different newspapers or different regions. The lower interest of Western media for terrorism in developing countries, rather than in North America and Western Europe, leads terrorists in developing countries to commit bloodier terror attacks. Increasing the number of fatalities and injuries is their only possibility of obtaining the desired media coverage.

The present contribution uses, and empirically tests, a simple game theoretic model of the relationship between the media and terrorist groups. To our knowledge, this is the first formal explanation of the symbiotic relationship between the two groups of actors. There is still much research to be done in the present field of study. Above all, collecting data on the percentage of people reading quality newspapers per country, and about the attribution policy of terror attacks in different countries, would be important.

References

Crelinsten, Ronald, 1997, "Television and Terrorism: Implications for Crisis Management and Policy-making", *Terrorism and Political Violence* 9: 8-32.

Delli Carpini, Michael and Bruce Williams, 1987, "Television and Terrorism: Patterns of Presentation and Occurrence, 1969-1980", *Western Political Quarterly* 40: 45-64.

Frey, Bruno, 1988, "Fighting Political Terrorism by Refusing Recognition", *Journal of Public Policy* 7: 179-88.

Frey, Bruno, 2004, *Dealing with Terrorism – Stick or Carrot?*, Cheltenham UK, Edward Elgar Publishing.

Frey, Bruno and Simon Lüchinger, 2003, "How to Fight Terrorism: Alternatives to Deterrence", *Defence and Peace Economics* 14: 237-49.

Frey, Bruno and Simon Lüchinger, 2004, "Decentralization as a Disincentive for Terror", *European Journal of Political Economy* 20: 509-15.

Gentzkow, Matthew and Jesse Shapiro, 2004, "Media, Education and Anti-Americanism in the Muslim World", *Journal of Economic Perspectives* 18: 117-33.

Hoffman, Bruce, 1998, *Inside Terrorism*, New York, Columbia University Press.

McKnight, Gerald, 1974, *The Mind of the Terrorist*, London, Michael Joseph.

Merrill, John, 1999, "The Global Elite: World's Best Newspapers Reflect Political Changes",
IPI Report 1999: 13-15.

Meyer, Philip and Koang-Hyub Kim, 2006, "Quantifying Newspaper Quality: 'I Know It
When I See It' ", *Newspaper Research Journal*, forthcoming.

Nelson, Paul and John Scott, 1992, "Terrorism and the Media: An Empirical Analysis",
Defence Economics 3: 329-39.

Schbley, Ayla, 2004, "Religious Terrorism, the Media, and International Islamization
Terrorism: Justifying the Unjustifiable", *Studies in Conflict and Terrorism* 27: 207-33.

Scott, John, 2001, "Media Congestion Limits Media Terrorism", *Defence and Peace
Economics* 12: 215-27.

Slone, Michelle, 2000, "Responses to Media Coverage of Terrorism", *Journal of Conflict
Resolution* 44: 508-22.

Wilkinson, Paul, 2000, *Terrorism Versus Democracy: The Liberal State Response*, London,
Frank Cass.