

Cooperation Between Terrorist Groups: Behaviors and Strategies

Sylvain Baumann
EDEHN, Normandie University, France

— *Review of* —
**Integrative
Business &
Economics**
— *Research* —

ABSTRACT

This article presents some model of cooperation between terrorist groups through a game-theoretic view in order to study their strategies. It is relevant to consider several cases corresponding to the presence or not of an international organization, such as the North Atlantic Treaty Organization (NATO), to analyze their behavior.

Keywords: Conflict, Security, Terrorism, Cooperation

1. INTRODUCTION

Since this tragic event, the literature on terrorism has been more numerous. Sandler et al.(1983) presented a rational-actor model which analyzed a negotiation process between terrorists and government policymakers. In this article two models are described: the first concerns the terrorists which have the choice between engaging in legal or illegal activities (hostage-taking). In the second model, the government has to decide to grant terrorist demands or not. They use probability constraints to introduce uncertainty. Sandler, Lapan and Siqueira point out strategies of a terrorist group in the case of an attack considering logistical success or failure due to level of deterrence applied by nations (Sandler and Lapan, 1988 ; Sandler and Siqueira, 2002 ; Lapan and Sandler, 1988). Sandler and Enders (2004) have shown an analysis on transnational terrorism with the use of game theory: they study the problem of hostage taking and the governmental responses to solve this problem. The choice of different targets and the possibility for them to deflect the attack have been analyzed by Sandler and Arce (2003). They distinguish two categories of terrorist: the hard-liners and the moderates. There are other papers dealing with this phenomenon. However, in terms of cooperation, the coalitions between countries have been mainly studied.

The interest of this paper is to study the cooperation between terrorist groups by using game theory. The advantages are that we can examine the strategies of the two players. Moreover, the action of one has consequences on the actions of all players. Why do we study the cooperation between terrorist groups? Some groups decide to cooperate for some reasons. They can share infrastructures and information. Some of them cooperate and create alliances in order to achieve the same goal. Indeed, the terrorists as well as the countries share their knowledge. Moreover, some terrorist groups are composed of several small groups, which can interact and so collaborate.

In order to neutralize a terrorist group or to reestablish the security in a nation, some countries rely on an international organization. The North Atlantic Treaty Organization (NATO) illustrates this will to protect the interests of all its members. Hence, international organizations have a fundamental role. It leads to analyze the behaviors of two terrorist groups in several cases corresponding to the presence or not of the NATO and when a country decides to help a smallest one.

2. COOPERATION BETWEEN IDENTICAL TERRORIST GROUPS

We consider a world composed of two representative countries threatened by two terrorist groups. These countries have not the same characteristics and differ from their resources. Consequently, their strategies are different and cannot respond to the terrorist requirements in like manner. A weak and poor country is not willing or not able to negotiate and to pay a ransom to avoid an attack. On the contrary, a rich and strong country is very well off but its protection combined with its technology allows it to confront an assault, either by neutralizing it or by reducing the damage. These countries are the potential targets for various reasons: ideological, criminal and so on.

The terrorist groups are supposed to be identical in the sense that their size and their funds are equivalent. We denote them by T_1 and T_2

Their strategies are the followings:

- it attacks a strong country (A_S)
- it attacks a poor country (A_W)
- it doesn't attack anyone (NA)

2.1. Presence of NATO

Terrorists have the choice between attacking or not. They have retaliations (R) from the international organization when they decide to attack any countries (See table 1). The terrorist utility stems from the damage caused by an attack: a group earns H when they carry out the assault on a strong country (by supposing that there is no probability of failure (in the case of failure the damage are supposed to be equal to 0); they earn L when the target is a weak country.

| | | T_2 | | |
|-------|-------|------------------------|------------------------|--------------|
| | | A_S | A_W | NA |
| T_1 | A_S | $H^C - R$ $H^C - R$ | $H - R$ $L - R$ | $H - R$ 0 |
| | A_W | $L - R$ $H - R$ | $L^C - R$ $L^C - R$ | $L - R$ 0 |
| | NA | 0 $H - R$ | 0 $L - R$ | 0 0 |

Table 1: Cooperation between identical terrorist groups ; Presence of United Nations

By cooperating (i.e. by attacking the same target) the damage are higher for each group than in the case of no cooperation ($H^C > H$ and $L^C > L$). One terrorist group causes more damage on a weak nation than on a strong country because the protective measures of the strong country are more efficient than measures of the other. However, the cooperation of terrorist groups is more efficient on stronger target. A terrorist group, who attacks a small country by cooperating, will earn more than if it attacks a strong country without cooperating.

Hypothesis:

$$H^C - R > L^C - R > L - R > H - R$$

Proposition 1:

Similar terrorist groups have interest to cooperate in order to obtain the higher payoff and have to attack the strong country in the majority of case when there is the presence of the NATO. The only condition not to attack is on the defense and the retaliations of a country. If the damages are higher than the retaliations, terrorist groups have to attack a strong country. However they have to attack the poor country if the protective measures of the strong one are too important.

Indeed terrorist groups have to cooperate and attack the strong country because the damages caused on it (in case of alliance) are superior to those caused on a small one. In static game the Nash Equilibrium is $(A_s; A_s)$ and $(A_w; A_w)$. The only case where they have to play the strategy "No Attack" corresponds to the case where retaliations are higher to the damages caused on a country.

We can describe some cases showing the strategies of each terrorist group when conditions on the payoffs change. The conditions A and B corresponds to the limit cases, the others (C to E) to the intermediate cases.

$$(A): \begin{cases} H^C - R > 0 \\ H - R > 0 \\ L - R > 0 \\ L^C - R > 0 \end{cases} \quad \parallel$$

In this case the NATO doesn't have enough information to localize the terrorist group and to cause it lots of damages. The decision of the terrorist leads not to attack the strong country.

$$(B): \begin{cases} H^C - R < 0 \\ H - R < 0 \\ L - R < 0 \\ L^C - R < 0 \end{cases}$$

The NATO has lots of information and possesses a better technology in order to attack terrorists. Terrorist groups are incited not to attack: if they attack then they lose more than they could earn. By choosing not to attack, they could wait in order to have more information and a better technology.

$$(C): \begin{cases} H^C - R > 0 \\ H - R < 0 \\ L - R < 0 \\ L^C - R < 0 \end{cases} \quad \parallel$$

Only the cooperation against a strong country procures a positive payoff. Either they attack this one or they do not launch the assault.

$$(D): \begin{cases} H^C - R > 0 \\ H - R < 0 \\ L - R < 0 \\ L^C - R > 0 \end{cases}$$

Only the cooperation allows positive payoffs. Consequently the two terrorist groups form a coalition ((As;As) and (Aw;Aw) and (NA;NA)).

$$(E): \begin{cases} H^C - R > 0 \\ H - R < 0 \\ L - R > 0 \\ L^C - R > 0 \end{cases}$$

Launching an isolated attack on the strong country gives a negative utility. In this case the two groups will play the same strategy As or Aw . They never decide not to attack.

2.2.Absence of NATO

Long before the creation of international organizations such as the NATO or the United Nations, countries had to protect themselves or to form alliances with the others. The aim is to understand the difference of terrorist behaviors. We have to consider two cases:

- when a strong country, if it is not attacked, protects a weak nation.
- when the strong country does not form a coalition.

2.2.1.The coalition between countries

The table 2 represents this case. If the terrorists plan to target together the strong nation, they receive reprisal from this country. In view of the fact that the terrorist groups are identical, the damages are divided by two (R/2). If only one attacks, it has this entire counterattack. To the contrary, it is obvious that they do not suffer from retaliations if they decide not to act. The conditions on the payoffs are the followings:

$$\parallel \\ D^C - R/2 > K^C - R/2 > K - R > D - R$$

| | | | | |
|-------|-------|----------------------------|----------------------------|----------------|
| | | T_2 | | |
| | | A_S | A_W | NA |
| T_1 | A_S | $H^C - R/2$ $H^C - R/2$ | $H - R$ L | $H - R$ 0 |
| | A_W | L $H - R$ | $L^C - R/2$ $L^C - R/2$ | $L - R$ 0 |
| | NA | 0 $H - R$ | 0 $L - R$ | 0 0 |

Table 2: Cooperation between identical terrorist groups ; Absence of United Nations ; Protection of the strongest country

Proposition 2:

In this case, the Nash solutions are the simultaneous attack on the weak country or not to attack. A terrorist group has to sacrifice itself if the other group wants to attack without repercussions.

They fear the totality of the retaliations in the case where the other terrorist group changes its strategy.

2.2.2. The absence of coalition between countries

In this configuration, the small country will not be protected and any country will not help it. The terrorists who attack this country will not have retaliations. This is the only change in comparison with the previous case. The table 3 gives this situation.

| | | T_2 | | |
|-------|-------|----------------------------|----------------|----------------|
| | | A_S | A_W | NA |
| T_1 | A_S | $H^C - R/2$ $H^C - R/2$ | $H - R$ L | $H - R$ 0 |
| | A_W | L $H - R$ | L^C L^C | L 0 |
| | NA | 0 $H - R$ | 0 L | 0 0 |

Table 3: Cooperation between identical terrorist groups ; Absence of United Nations ; No protection of the strongest country

Proposition 3:

In the case of no outside protection for the weak country, the terrorists are incited to coordinate their strategies to attack it. The risk is reported to this nation, which become the preferred prey.

3. CONCLUSION

This paper enables to compare the terrorist strategies in the framework of conflict and more particularly in the context of terrorist attack against nations. We notice that the international organizations are primordial in the smooth functioning of anti-terrorist fight. This is the reason why the terrorist networks aim to create tension in the international community with an eye to weaken or to destabilize agreements between members.

The static analysis is justified by the fact that a terrorist group has to decide on a strategy at some point but we could pursue this study in a dynamic framework.

Moreover we suppose that the characteristics of the countries are different, which has been useful to show the risk transfer. We could consider that such a hypothesis is relevant for the size of the terrorist networks.

REFERENCES

- [1] Brophy-Baermann, B., and Conybeare, J. (1994) "Retaliating Against Terrorism: Rational Expectations and the Optimality of Rules versus Discretion". *American Journal of Political Science*, 38, 196-210.
- [2] Enders, W. and Sandler, T. (1993) "The Effectiveness of Anti-Terrorism Policies: Vector-Autoregression-Intervention Analysis". *American Political Science Review*, 87, 829-844.

- [3] Lapan, H. E., and Sandler T. (1988) "To bargain or not to bargain: That is the question" *American Economic Review*, 78, 16-20.
- [4] Lapan, H. E., and Sandler, T. (1993) "Terrorism and signaling". *European Journal of Political Economy*, 9, 383-397.
- [5] Sandler, T., and Arce M. D. G. (2003) "Terrorism and Game Theory". *Simulation and Gaming*, 34, 319-337.
- [6] Sandler, T., and Enders W. (2004) "An economic perspective on transnational terrorism". *European Journal of Political Economy*, 20, 301-316.
- [7] Sandler, T., and Siqueira, K. (2002) "Global terrorism: Deterrence versus preemption" *Canadian Journal of Economics*, 50, 1370-1387.
- [8] Sandler, T., and Tschirhart, J. T., and Cauley, J. (1983) "A theoretical analysis of transnational terrorism". *American Political Science Review*, 77, 36-54.
- [9] Sandler, T., and Lapan, H. E. (1988) "The calculus of dissent: An analysis of terrorists' choice of targets". *Synthese*, 76, 245-261.