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Protection, Alliance and Negotiation against a Terrorist Threat

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Abstract

The aim of this paper is to analyze the decision-making process of a targeted country threatened by a terrorist group. This country has the choice between improving his arms, forming an alliance with a border country or negotiating with the terrorists. However, his resource do not enable him to have a complete alliance or to pay the total ransom. The government has to do an arbitrage among the strategies. After determining the equilibrium, we focus on the effects of each parameters.

1. Introduction

Nowadays the majority of countries are confronted to the terrorist phenomenon. This threat is omnipresent and this fear has increased in Western countries since the September 11th attacks. The countries have lots of difficulties to counter this threat. Attacking a country may turn out to be easier insofar as a country is delimited by borders. Concerning the terrorist groups, they are sorely localizable. Therefore, they are sometimes impossible to neutralize. However, several solutions exist to eradicate this plague or at least limit the consequences. These solutions divide into two categories: the offensive strategies and the defensive strategies. Sandler and Arce (2003) analyzed these various strategies and concluded, through their model, that the defensive strategies are often privileged. However, it is possible that the government assigns a part of its budget to the protection and another part to attack. A mix of these strategies is possible and gets closer to the reality. Moreover, it is inconceivable to bet everything on an offensive strategy for fear of reprisals if the attack failed and that the terrorist group survives and counter-attacks. Some authors have studied the role of the alliance in conflict such as Olson and Zeckhauser (1966) who analyzed the free riding alliance. Walt (1987) focused on the relationship between Israel and the United States. Most of the authors analyze the alliance as a mean to have a better protection. However, a country can decide to negotiate with terrorists and to form an alliance with them. The negotiation has been essentially studied in the case of hostage-taking: Atkinson, Sandler, and Tschirhart (1987), Lapan and Sandler (1988), Selten (1988), Islam and Shahin (1989), Sandler and Scott (1987), Scott (1991), Shahin and Islam (1992) and Sandler and Enders (2002). However, a terrorist can ransom not to attack a country.

The main offensive strategies used in the models are principally the attacks and the infiltration. The attack enables the government to weaken the terrorists, or even to annihilate them. However, it is difficult to attack a group because of the unknowing of his location. Furthermore, the groups are mainly organized in networks, making the task even more difficult. To destroy a branch of the network will not prevent the terrorists from stopping their scheme, unless reaching directly the leaders or the decision-makers, to which case the terrorist group could disappear. Consequently, the governments appeal to intelligence services to infiltrate the terrorists and to manage to localize the whole network.

Concerning the defensive strategies, these mainly turn around two axes: the protection and the alliance with the other countries. If a country cannot attack directly the group and, consequently, cannot reduce its resources, the

only solution is to establish an effective protection in order to neutralize the attack. However, a country does not dispose of sufficient resources to protect itself effectively. Furthermore, the protection will not be the same according to countries due to the functions of protection: for the same level of security, every country will not assign the same amount to the protection. To remedy this problem, the threatened countries can appeal to the other countries by forming an alliance. The alliance has a cost but it is sometimes less than the potential damages. This arbitration between the acquisition of weapon to improve the security and the wished degree of alliance has been analyzed by Sorokin (1994). The choice of the target has not been taken into account in his model. If a nearby country helps the targeted country and allows him to neutralize the attack, the terrorist group could have grievances against the allied country. Another solution to calm the murderous intentions of the terrorists is the financing or the alliance with this one. A terrorist group requires funds to organize an attack. His resources consist of the financing by countries, the ransoms and the incomes resulting from illegal activities. To prevent an attack, a country can decide to become allied with terrorists or to pay a ransom. This is the purpose of this paper.

2. The Model

Here we consider a constrained optimization model where a country maximizes his utility and consequently his security, subject to his budgetary constraint. The targeted country is threatened by a terrorist group k. However, this country 1 can get help from the country 2 with the aim of improving its protection. The situations illustrated by the figure 1 represent the cases of total alliance with either the border country or the terrorist group.
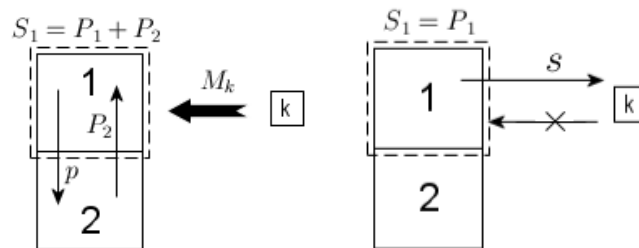

Figure 1: Total alliance with a border country or a terrorist group

We suppose that both countries are border but only the country 1 is threatened. The country 2 is neutral but he is ready to help the country 1 in

2

exchange for a payment. The terrorist group is supposed localized outside the borders of both countries. By keeping this hypothesis, we do not differentiate the internal security from the border security. Indeed, if a terrorist group is situated inside a country, he will not be confronted to all the security. The terrorists promise to give up the attack if the country pays the ransom. However, the amount asked for the ransom can be very high such as the country cannot pay. We suppose here that the targeted country is not rather powerful to protect himself only. In every case, he needs an outside help. The security of the first country is equal to the sum of the protection of this country at which is added the outside help. This protection, denoted by P_1 depends on its cost C_1. This function is increasing and concave. The protection P_2 of the second country has the same properties. To improve his security, the targeted country can decide on the tightness of the alliance, noted a. According to this degree of alliance, the country receives a part of the protection of his ally. The help brought by this country is thus aP_2, with $0 \leq a \leq 1$. In exchange for this help, the beneficiary will have to pay an amount p dependent on the degree of alliance, that is to say ap.

The total cooperation with the terrorist group allows to avoid an attack. However, if the ransom s is too high, the government cannot satisfy their request. Consequently, he decides on a level of alliance. The higher this degree is, the more tension between them the country will reduce. So, it reduces the intensity of the terrorist attack. The closer the government is with the terrorists, the more he goes away from the border country: the level of alliance with the terrorists is designated by $(1 - a)$. The amount of the paid ransom is of $(1 - a)s$. The intensity of the attack is decreasing with the paid sum. Thanks to this ransom, the government will avoid damages estimated to $(1 - a)M_k$, where M_k represents the maximal terrorist damages.

For a political or ideological reason, it is possible that the priority of the terrorists is only this country, even if the country 2 offers his help and improves the security. This model focuses only on the strategic decision of the first country. Consequently, we suppose that M_k, s, p and C_2 are exogenous variables. The endogenous variables are the level of alliance wished by the country a and $(1 - a)$, as well as the amount assigned to the acquisition of weapons, C_1.

The utility of the first country is given by:

$$U_1 = S_1 - M_k \quad with \;\; S_1 = P_1 + aP_2 + (1 - a)M_k$$

$$\Rightarrow U_1 = P_1 + aP_2 - aM_k$$

The resources of the country 1 are not unlimited. As in every country, a budget is allocated to the defence. This budgetary constraint is denoted by B_1. The resources cannot be negative. It is supposed that $B_1 \geq 0$. It consists of the sum assigned to the protection C_1, the amount assigned for an alliance with the border country (ap) and for an alliance with the terrorist group $((1-a)s)$: $B_1 \geq C_1 + ap + (1-a)s$

The price for forming an alliance is purely positive ($p > 0$ and $s > 0$). The first country maximizes his utility subject to his budgetary constraint:

$$\max_{C_1, a} U_1 = P_1 + aP_2 - aM_k$$

$$\text{with respect to } \; B_1 \geq C_1 + ap + (1-a)s$$

By determining the alliance tightness with the border country, we can deduct the level of cooperation with the terrorist group. We take back the protection functions of Sorokin (1994) respecting the hypotheses of growing and concavity: $P_1 = \ln(C_1 + 1)$ and $P_2 = \ln(C_2 + 1)$. To solve this constrained maximization problem, we use the Lagrangian function:

$$L(C_1, a, \lambda) = P_1 + aP_2 - aM_k + \lambda(B_1 - C_1 - ap - (1-a)s) \qquad (1)$$

At the equilibrium, we have the following results:

$$C_1^* = \frac{p - s}{\ln(C_2 + 1) - M_k} - 1 \qquad (2)$$

$$a^* = \frac{B_1 + 1 - s}{p - s} - \frac{1}{\ln(C_2 + 1) - M_k} \qquad (3)$$

$$(1 - a)^* = \frac{p - B_1 - 1}{p - s} + \frac{1}{\ln(C_2 + 1) - M_k} \qquad (4)$$

From the equations (2), (3) and (4), we deduct the expression of the other endogenous variables:

$$P_1^* = \ln\left(\frac{p - s}{\ln(C_2 + 1) - M_k}\right) \qquad (5)$$

$$S_1^* = \ln\left(\frac{p - s}{\ln(C_2 + 1) - M_k}\right) + \left(\frac{B_1 + 1 - s}{p - s}\right)(\ln(C_2 + 1) - M_k) - 1 + M_k \qquad (6)$$

$$U_1^* = \ln\left(\frac{p - s}{\ln(C_2 + 1) - M_k}\right) + \left(\frac{B_1 + 1 - s}{p - s}\right)(\ln(C_2 + 1) - M_k) - 1 \qquad (7)$$

4

3. Analysis: Effect of the price of the border country alliance

According to the value of the exogenous parameters, the decisions of the government will not be the same. Several hypotheses has to be predicated to proceed to the analysis. We suppose that the price of the alliance is increasing with the protection of the country 2. It means that the country 2 has better resources to proceed to the acquisition of weapons and so to improve his protection. His resources are generated by his budget of defence and by the allied contribution. Also, the ransom is increasing with the threat. If the ransom is high but the terrorist threat and the group are weak, then the threat is not credible. From it, we deduct that if $p > s$ then $P_2 > M_k$. Although we suppose that the ransom is too much high to be paid by the government, we raise this hypothesis in order to distinguish all the possible cases. The tables from 1 to 4 summarize the various effects of p.

	C_1	P_1	a	$(1-a)$	U_1
p	+	+	+	-	+

Table 1: If $p > s$ and $s > B_1$

	C_1	P_1	a	$(1-a)$	U_1
p	+	+	-	+	-

Table 2: If $p > s$ and $s < B_1$

	C_1	P_1	a	$(1-a)$	U_1
p	-	-	+	-	-

Table 3: If $p < s$ and $s > B_1$

	C_1	P_1	a	$(1-a)$	U_1
p	-	-	-	+	+

Table 4: If $p < s$ and $s < B_1$

Four cases are possible. The figure 2 summarizes these situations (A, B, C, D) specifying the adopted strategy of the government.

A : The government is confronted to a powerful terrorist group. The ransom is impossible to pay completely. He decreases his spending of arms to try to preserve the outside help emanating from his ally. The decline in arms compensates the increase of the price of the alliance, corresponding to a higher efficiency.

B : Even if the second country increases his price to benefit from his services, the government decreases even more the alliance with the terrorists in order to increase the alliance with the border country and to increase its spending in internal protection. Therefore, the terrorists will receive less money, and, consequently, they will launch a more violent attack. The

government thinks that the attack will be neutralized by his security, essentially due to the protection resulting from the outside. If the country 2 increases its price, it contributes to a better quality of protection.

C : The negotiation allows to resolve the conflict. The government wants to avoid any kind of conflict. His spending in arms is thus decreasing.

D : The government knows that it is possible to pay the totality of the ransom and consequently to avoid being attacked. The alliance with the country is useless even if the protection of his ally improves. The difference between its budget and the ransom will serve for obtaining new weapons to keep a minimum of internal protection.
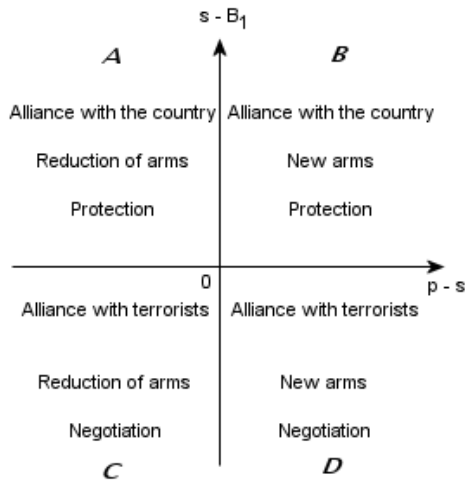

Figure 2: Government decision

4. Conclusion

This paper focuses on the governmental decision-making process when he is threatened by terrorists. He has the choice between having new arms, forming an alliance with an ally or the enemy. Until his resources are low, his strategy is a mix of these strategies. However, the first conclusions concerns the effect of the price of the alliance withe the border country. This price is synonym of quality. If this increase justifies a better efficiency of the protection, then the tightness of this alliance will be closer. According to the effect of the other parameters, it could lead to other conclusions.

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