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## Transnational terrorisms as a spillover of domestic disputes in other countries

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**WIDER**

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Discussion Paper No. 2002/120

## **Transnational Terrorism as a Spillover of Domestic Disputes in Other Countries**

Tony Addison<sup>1</sup> and S. Mansoob Murshed<sup>2</sup>

December 2002

### **Abstract**

This paper models transnational terrorism as a three-way strategic interaction involving a government that faces armed opposition at home, which may spill over in the form of acts of terrorism by the state's opponents against the government's external sponsor. The external sponsor also utilizes deterrence against potential terrorists, which only lowers terrorism if terrorists are not intrinsically motivated by a deep-seated sense of humiliation. A rise in the external power's preference for deterrence against terrorism may backfire in these circumstances. Increases in the government's military efficiency against the rebels, who are also terrorists against the government's sponsor raise overall levels of violence.

Keywords: conflict, terrorism, civil war

JEL classification: C72, D81, H11, O19

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## 1 Introduction

The attacks on 11 September 2001 have focussed our minds on the dangers of transnational terrorism. Conflicts in far-flung places can now impact on the ordinary citizens of countries that are seemingly unconnected with the quarrels that motivate such violence. The intention of such *indirect* attacks is to affect people who have influence over the powers directly involved in the dispute. It also serves to attract attention to a conflict neglected by the media and government in influential nations. Consequently, while bombings, hijackings, and kidnapping often cause death and injury, they are usually intended to have a psychological impact that goes beyond the numbers killed, and therefore measuring their intensity in terms of the number of fatalities, as is done with other types of conflict, is problematic.

A transnational terrorist act is one that impacts on the citizenry or interests of a country not directly part of the conflict in question. It can occur anywhere, both in the country where the conflict is occurring or elsewhere. Thus, for example, if the USA or the west is a target, then its citizens may be attacked in countries where the attackers are fighting the state, such as by Jihad in Egypt or Moro separatists (Abu Sayyaf) in the Philippines. Mainland France may be subject to attacks by the Algerian FIS. Attacks or kidnappings can also occur in third countries, such as Malaysia; attacks on US interests can take place in the USA (such as against the Twin Towers), or elsewhere as with the US embassy bombings in East Africa.

In an influential paper Doran (2002) points out that transnational terrorism really reflects a civil war taking place elsewhere. The ultimate objective of the terrorists is to induce a backlash that will cause the masses in the country with the domestic dispute to rise against their oppressive state. A further implication of that paper, and one that has considerable intuitive appeal, is that the nationals or interests of the country subjected to terrorism also represent something that is in some way a backer or ally of the real enemy of the terrorists. Thus, when westerners are kidnapped by the FARC in Colombia, or the Abu Sayyaf in the Philippines, the political aim of the kidnappers is to target the policy of support by the west for the government that the terrorists wish to overthrow. The interests and citizens of the United States, and its close western allies, have become major targets for terrorist action by groups who see it as a sponsor and ally of regimes and states that are in a real or virtual state of civil war with rebellious groups. The USA is a major financial and military sponsor of Israel, and of other governments in the Middle East who are disliked and violently opposed by certain opposition groups, such as in Egypt and Jordan. The United States has become a close ally of India in the context of the Kashmir dispute, and India has recently engaged in military cooperation with Israel. Some groups, such as Al-Qaida at present, and Libya in the past, may espouse a raft of multinational causes ranging from the opposition to the US military presence in Saudi Arabia to the Israeli treatment of Palestinians, including opposition to Indian policies in Kashmir, and in the past, support for the IRA in Northern Ireland (by Libya and Iran in the 1980s). Transnational terrorism is not confined to the developing world. Activities of groups such as November 17th in Greece against western targets, or the IRA in mainland Britain are two examples.

The purpose of this paper is to model these three-way interactions in a game-theoretic framework. The parties include a government that faces armed opposition at home; this may spill over in the form of acts of terrorism by the state's opponents or rebels against

the government's external sponsor. This paper is concerned with the 'demand' side for terrorism. There is a vast literature on terrorist interaction and negotiation with the government affected by terrorism. Other papers are concerned with the 'supply' side of terrorism; recruitment, retention, group formation and conformity, see for example, Ferrero (2002) and Wintrobe (2002). Still others are concerned with the global anti-terrorist deterrence burden sharing between the USA, UK, France and other western powers, for example, Sandler and Enders (2002). However, scant attention has been paid in the analytical modelling literature to terrorism as a spillover of a domestic dispute involving a government, a rebel group, and an outside sponsor of the government, as in our paper.

In section 2 we outline the model in question. We begin by positing a domestic dispute, which for analytical convenience resembles a civil war, but could include armed rebellion or other forms of organized violence by excluded groups, and the state's response to it. The government itself receives support from an external power, which we characterize as financial aid, but this variable could also encapsulate other forms of assistance. This aid can be utilized either to fight or appease rebels (in the latter case through a fiscal transfer to them to reduce their level grievance, such as increased social spending or political inclusion to redress past neglect). We model acts of appeasement by the government through the mechanism of a financial transfer. Rebels react 'optimally' via strategies in connection with their interaction vis-à-vis both the government and its external sponsor. The rebel options include optimal quantities of fighting or peaceful efforts against their enemy at home and its external sponsor, with terrorism directed against the latter. Both the government and the rebel (and terrorist) sides' strategies are defined in terms of peacefulness rather than belligerency. This, somewhat counterintuitive, strategy-space is justified on the grounds that foreign aid (in financing a fiscal transfer) and economic development (in reducing poverty) may promote inclusion and the peaceful resolution of disputes.

The outside power is concerned with its own security, something that can be achieved either through its own deterrence of terrorism, or the mechanism of aid to the government, which is meant to be used to pacify and include the rebels (but may be misused for fighting, which in turn may endanger the foreign power by directing rebel attention to it). To avoid excessive complication, we rule out direct foreign military assistance to the government. Just as there will be governments who are prone to belligerency or more inclined to appease the rebels, the rebels too can be of a more or less militant type. The former type nurses a deep historical sense of grievance and collective humiliation (see Lindner 2001 on humiliation in general and violent expressions of collective humiliation). They will not be easily deterred, as they are strongly imbued with an *intrinsic* motivation to fight, and instead they will respond to acts of deterrence with greater militancy. The latter (less militant) type of terrorist group's motivation resembles criminality, and that is something that can be more readily deterred. Section 3 is concerned with non-cooperative behaviour and parameter changes, and finally section 4 briefly concludes, emphasizing that purely military solutions can backfire.

## 2 The model

### 2.1 Government ( $G$ )

The utility of the government side is given by:

$$G = \pi(a, e, t)G^P + (1 - \pi)(\cdot)G^C - C(a) \quad (1)$$

where:

$$\begin{aligned} G^P &= \bar{Y}^G + A - pF^G(A, \mu) - T(A) \\ G^C &= \bar{Y}^G + A - cF^G(A, \mu) - \lambda T(A), \lambda < 1 \\ a &= \frac{T(A)}{F^G(A, \mu)} \\ c > p > 0, c + p = 1, \pi_{a, e, t} > 0. \end{aligned} \quad (2)$$

For the government, income ( $Y^G$ ) is composed of an exogenous component and a variable foreign aid ( $A$ ) part. The parameter,  $A$ , captures aid from a foreign power or sponsor ( $S$ ) which can be used either for fighting the rebels ( $F$ ) or for peaceful transfers.  $T$  is a transfer to the rebel group, which assuages their grievance. A full and credible transfer only takes place in the peaceful state, otherwise it is given with imperfect credibility ( $\lambda < 1$ ) in the state of conflict. The transfer can mean several things: increased (broad-based) public expenditure, inclusion in government jobs, power sharing and voice in the decision-making process. Generally speaking, it is the pecuniary value of including the excluded.

Note that strategies for the government and rebels are in terms of peaceful behaviour, so  $a$ ,  $e$  and  $t$  raise chances of peace,  $\pi$ .  $C$  refers to the cost of undertaking  $a$  by the state,  $C_a > 0$ . The superscripts  $P$  and  $C$  refer to states of peace and war, respectively. Even the peaceful state is associated with military expenditure (i.e., a state of armed peace). The rebels too do not entirely disarm, although this assumption can be changed without affecting the results of the model.

The parameter  $\mu$  denotes the relative fighting efficiency of the government over the rebels. In other words, it approximates the contest success functions favoured by all theorists of conflict (see Hirshleifer 1995, for example). Normally, contest success functions in the context of civil war are a ratio of military spending by one side relative to total military expenditure, weighted by decisiveness or a fighting efficiency parameter. Here we focus on the latter aspect, pure military effectiveness, as fighting expenditure is a function of available resources, including aid.<sup>1</sup> In equation (2)  $G^P$  and  $G^C$  correspond to budget constraints in the two states.

It is instructive to examine the government's strategic variable. Totally differentiating,  $a$ , the government's strategic choice variable:

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<sup>1</sup> The military effectiveness of the government against the rebels could include not only conventional fighting but also acts of torture and other human rights abuses against rebel fighters and their families.

$$da = \left[ \frac{T_A}{F^G} - \frac{T}{F_A^{G2}} \right] dA - \frac{T}{F_\mu^{G2}} d\mu \quad (3)$$

All the partial derivatives in (3) are positive. Aid ( $A$ ) is part of the income of the government, and it can be utilized either to increase transfers to the rebels or fight them. Therein lies a trade-off; thus the term in square brackets in (3) is ambiguous in sign. The second term on the right-hand side of (3) is negative, because a rise in the relative fighting efficiency of the state causes it to be less peaceful. For a type 1 or good government, the first term is positive; it prefers peace.

Given exogenous payoffs in the two states of peace ( $P$ ) and conflict ( $C$ ), the government will maximize (1) with respect to  $a$ :

$$\pi_a [G^P(\cdot) - G^C(\cdot)] = C_a \quad (4)$$

Essentially, this means that the government equates the marginal utility of its strategic action ( $a$ ) on the left-hand side of (4) with the marginal cost on the right-hand side.

## 2.2 Rebels ( $R$ ) who are also terrorists against the government's external sponsor

The rebel objective or utility function takes the following form:

$$R = \pi(a, e, t)R^P + (1 - \pi)(\cdot)R^C - E(e, t) \quad (5)$$

where:

$$\begin{aligned} R^P &= Y^R - pF^R(\mu) + T(A) \\ R^C &= Y^R - cF^R(\mu, \theta) - F^S(D) + \lambda T(A), F_\theta^R, F_\mu^R > 0 \\ e &= \frac{T(A)}{\theta F^R(\mu)} \\ t &= t(\mu, D) \end{aligned} \quad (6)$$

Income ( $Y^R$ ) for the rebel group is exogenous, and  $R^P$  and  $R^C$  describe their budget constraints. The rebel group choice's surround  $e$  (effort with regard to peace with the state) and  $t$  (the *inverse* of terrorism against the government's foreign sponsor).  $E$  describes the cost function for undertaking  $e$  and  $t$ , with  $E_e, E_t > 0$ .  $F^R$  represents fighting against the government. Here  $\theta$  denotes historical hatred and intrinsic motivation to fight the state, and  $D$  represents deterrence against terrorism engaged in by the outside power.  $F^S$  denotes terrorist acts against the foreign sponsor of the government. If  $F_D^S < 0, t_D > 0$ , then deterrence works, it reduces terrorism and vice versa. We will allow these signs to vary, for different (easily deterred and militant) types of rebel or terrorist groups in the analysis that follows. There is no terrorism in the peaceful state, as the rebels have no reason to attack the government's external backer.

Differentiating the strategic variables ( $e$  and  $t$ ) we find:

$$de = \frac{T_A}{\theta F^R(\mu)} dA - \frac{T}{\theta^2 F^R(\mu)} d\theta - \frac{T}{\theta F_\mu^{R2}} d\mu \quad (7)$$

The first term on the right-hand side of (7) is positive,  $e$  rises with  $T$ , but falls with  $\theta$  and  $\mu$ . In other words, transfers from the state raise peaceful behaviour, but a rise in intrinsic motivation and the government's fighting efficiency lower peaceful behaviour by the rebels towards the state.

$$dt = t_\mu d\mu + t_D dD, t_\mu < 0, t_D ? \quad (8)$$

Equation (8) implies the rebels engage in less terrorism (the inverse of  $t$ ) against the outside sponsor of the state the more profitably they fight inside the country versus the state. Increases in the government's fighting efficiency, however, induce more terrorism against 'soft' or hard overseas targets belonging to the state's external sponsor, the first term on the right-hand side of (8). Deterrence reduces terrorism against the sponsor if  $t_D > 0$ , which is not always the case.

As with the government, the payoffs to the rebels are exogenous, and the rebel group will maximize (4) with respect to  $e$  and  $t$ :

$$\pi_e [R^P(\cdot) - R^C(\cdot)] = E_e \quad (9)$$

and

$$\pi_t [R^P(\cdot) - R^C(\cdot)] = E_t \quad (10)$$

The rebel group thus equates the marginal benefit of  $e$  and  $t$  with their respective marginal costs.

### 2.3 Outside sponsor ( $S$ ) of the government

The outside sponsor is interested in its own security which can be achieved by giving aid to the government that will induce the type 1 ('good'/peace-preferring) government to increase transfers and appease the rebels. The object of the aid is to increase peaceful behaviour amongst the parties to the civil war. If, however, the government utilizes aid to increase its fighting effort against the rebels, the rebels will turn against the outside sponsor via acts of terrorism at home and abroad (including in third countries). Alternatively, the external power may use deterrence to emasculate the terrorist activities of the rebels. Consider the following form for the utility or security production function of the external power:

$$S = S(A(a, e), \gamma D(t)) - Z(A, D) \quad (11)$$

The security function ( $S$ ) of the sponsor rises with peaceful behaviour ( $a$  and  $e$ ) by the government and rebel side to the domestic dispute. It is a reduced form of the



government and rebel utility functions. Peacefulness may be induced via the mechanism of aid to the government, which can result in greater  $a$  and  $e$  if aid causes the transfer,  $T$ , to be affected. Deterrence ( $D$ ) will work if it reduces terrorism by the rebels (raises  $t$ ) and  $\gamma$  is a shift parameter in the perceived value of deterrence. It includes actions proscribing the activities and finances of the rebels, as well as military action.  $Z$  is a cost function for the two choices of the sponsor, aid and deterrence. It is *a priori* unclear whether aid or deterrence is costlier per unit.

Maximizing (11) with respect to  $A$ , we obtain:

$$S_A(A_a + A_e) = Z_A, Z_A > 0 \quad (12)$$

This means that the marginal benefit of aid in terms of peaceful action by the two sides to the domestic dispute is equated to the marginal cost of giving aid. Note that the parameters,  $A_a$  and  $A_e$  may be evaluated from (3) and (7) above setting  $d\mu, d\theta = 0$ . It means that the marginal benefit of aid is positive only for that variety of government that prefers peace (the type 1 government for whom the sum of the first term on the right-hand side of (3) is positive). Thus, there is a potential adverse selection problem here. Alternatively, and more realistically, there is a signalling or reputational problem associated with guessing the type of government.

Turning now to optimal deterrence levels we find:

$$S_D \gamma D_t = Z_D, Z_D > 0 \quad (13)$$

This is positive only if  $D_t > 0$ , and deterrence works by lowering terrorism (the inverse of  $t$ ). If  $D_t < 0$ , then the expression on the left-hand of (13) is negative, and the optimal level of deterrence is zero. We will argue that this is dependent on the beliefs of the external power regarding the efficacy of deterrence. So, we have two sets of alternative types here in connection with the effect of deterrence on terrorism. First, for the more committed rebels (militants)  $t_D < 0$ , increased deterrence hardens their will to strike at the external sponsor of their domestic enemy. The converse holds for the more readily deterred rebels. We could also argue that the sign of  $t_D$  alters as the quantity of deterrence is increased. Second, as regards the outside power, there is the possibility that their beliefs are that deterrence always works by diminishing terrorism (hawks),<sup>2</sup> as well as a chance that they are more cautious regarding the efficacy of deterrence (doves). For the former group  $D_t > 0$ , and vice versa for the doves. Those who believe that deterrence works might be motivated by their own sense of morality or their desire to pre-empt and strike first against terrorism. In conformity with current reality, we will assume that the external power is hawkish, believing in the efficacy of deterrence, more  $D$  raises  $t$  (the opposite of terrorism), thus  $D_t$  is always positive.

## 2.4 Model solution and the game form

The game follows three stages:

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<sup>2</sup> For example, some of the more hawkish members of the present US administration.

- (1) The external sponsor of the government chooses  $A$  and  $D$ , given conjectures or beliefs about the government and the rebel types. In forming the conjecture about the government's type (peaceful or warlike), two possible classes of problems arise. The first is adverse selection regarding the type of government, associated with aid giving (see Murshed and Sen 1995). The outside donor will have to meet its client's participation constraint, and aid cannot be below the recipient's reservation utility. The sponsor will also need to satisfy the incentive compatibility constraint of the government so as to make it truthfully reveal its true type and carry out the function (make the transfer to the rebels) which is the *quid pro quo* for aid. But because the task following the granting of aid is not enforceable, the incentive compatibility constraint does not actually bind the recipient government to carry out its side of the bargain. Even when the aid-donor relationship is repeated over time, there are still incentives for the government to deviate from conditionality. Therefore, the donor has to make a prior guess about the government's reputation, based on past behaviour. We will not explicitly analyse its priors about government and rebel types, see Addison and Murshed (2002) for an analysis of credibility and reputation in the context of peacemaking following a civil war. If the donor (foreign power) thinks it is a type 2 (warlike) government, aid may not be given.<sup>3</sup> But the game will still proceed as the government and the rebels are still at loggerheads, and choose optimal fighting strategies with possible terrorism implications. There are no problems of agency, associated with the government's choice of deterrence against the rebels, as no *quid pro quo* is involved. All that matters is the external power's beliefs about the efficacy or morality of deterrence; we assert that they believe deterrence reduces terrorism.
- (2) In stage 2, after the choice of  $A$  and  $D$  by the sponsor, the government and the rebels choose,  $a$ ,  $e$  and  $t$  simultaneously, given  $\theta$ ,  $\mu$ . The government and the rebels interact in a Cournot-Nash fashion with strategies in  $a$  and  $e$ . If the government makes a full and credible transfer to the rebels, then  $a$  and  $e$  is maximized and there is peace.
- (3) In the absence of a fully credible transfer we move to stage 3, the outside sponsor reacts to the rebel group's choice of  $t$  with  $D$ , with the external power and the terrorists interacting non-cooperatively in  $D$  and  $t$ .

### 3 Comparative statics

In order to analyse variations in parameters, we first need to obtain two sets of reaction functions in  $(a, e)$  and  $(D, t)$  space to capture government-rebel and sponsor-terrorist interaction.

#### 3.1 Reaction functions

Equations (4) and (9) form the basis of the reaction functions for the government and the rebels, obtained by totally differentiating them with respect to  $a$  and  $e$ . Thus:

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<sup>3</sup> Under uncertainty about the recipient's type, the donor might still wish to give aid to the government knowing it to be belligerent, if it wants to maximize the slim likelihood of aid being effective in securing peace. Analytically, the donor will maximize the expected value of the left-hand side of (12).

$$\frac{de}{da/R^G} = \frac{C_{aa} + \pi_{aa} [G^C(\cdot) - G^P(\cdot)]}{\pi_{ae} [G^P(\cdot) - G^C(\cdot)]} \begin{matrix} \geq \\ \leq \end{matrix} 0 \text{ if } \pi_{ae} \begin{matrix} \geq \\ \leq \end{matrix} 0 \quad (14)$$

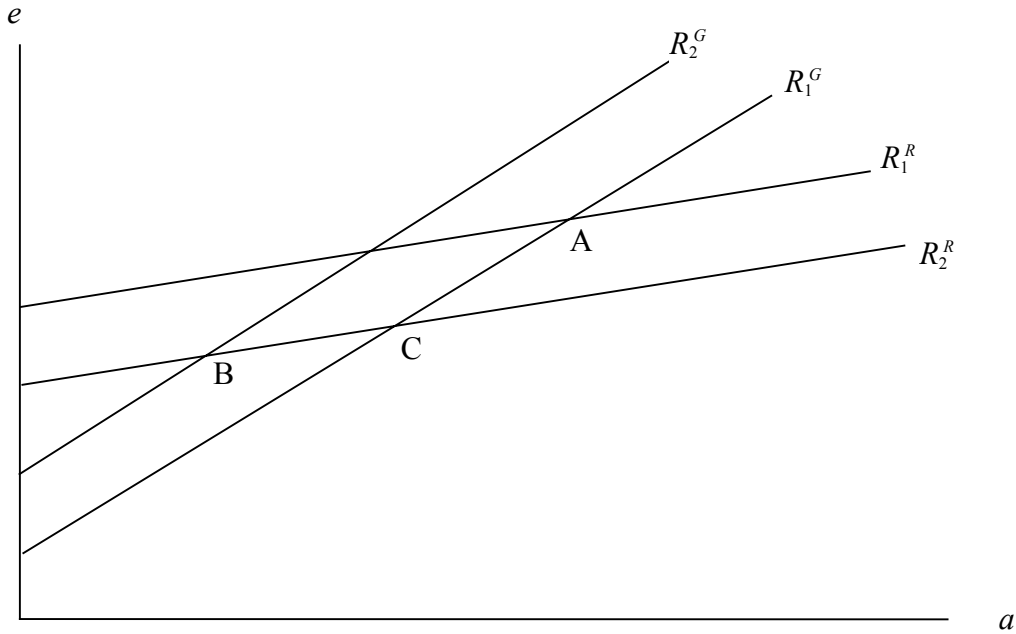
and

$$\frac{de}{da/R^R} = \frac{\pi_{ae} [R^P(\cdot) - R^C(\cdot)]}{E_{ee} + \pi_{ee} [R^C(\cdot) - R^P(\cdot)]} \begin{matrix} \geq \\ \leq \end{matrix} 0 \text{ if } \pi_{ae} \begin{matrix} \geq \\ \leq \end{matrix} 0 \quad (15)$$

Note that  $\pi_{ae} = \pi_{ea}$  by symmetry. Also even though  $\pi_a, \pi_e > 0$ ,  $\pi_{aa}, \pi_{ee} < 0$ , meaning there are diminishing returns to peaceful behaviour.  $C_{aa}, E_{ee} > 0$ ,  $R^P > R^C$ ,  $G^P > G^C$ .

We assume that the two strategies are complements,  $\pi_{ae} > 0$ . In other words more peaceful action or warlike behaviour by one side leads to the same by the other. The reaction functions will be positively sloped in Figure 1.

Figure 1  
Strategic interaction between the government and rebels



As far as the outside sponsor and the rebels who are now terrorists are concerned, their reaction functions are based on (13) and (10) which are differentiated with respect to  $t$  and  $D$ :

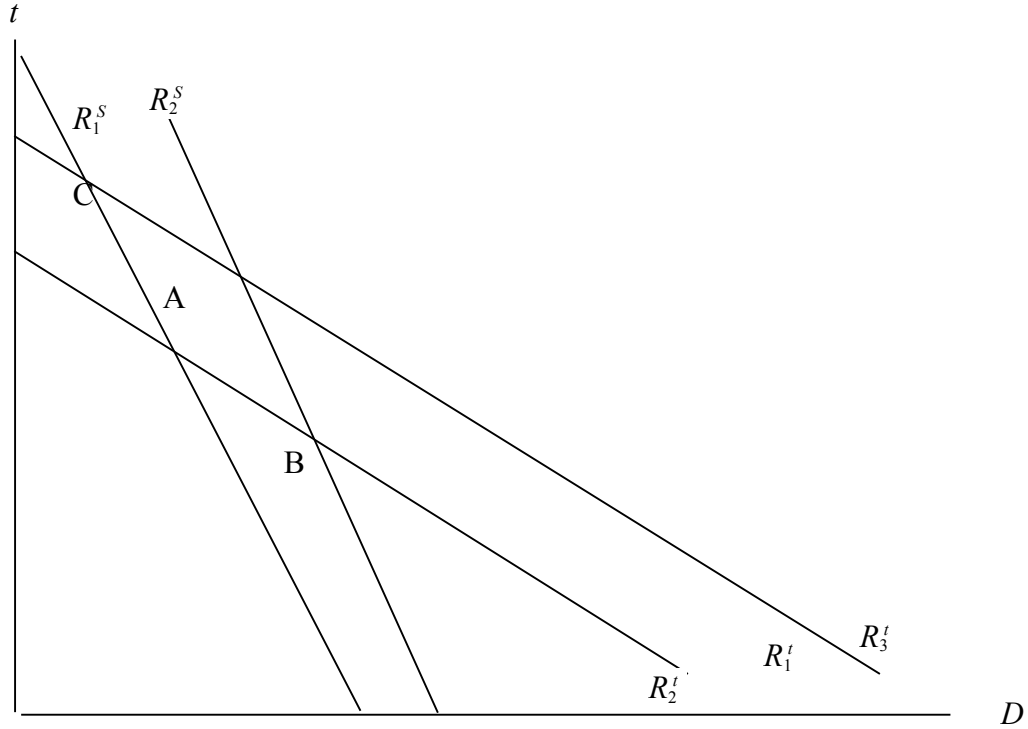
$$\frac{dt}{dD/R^S} = \frac{Z_{DD} - S_{DD}\gamma D_{tD}}{S_{DD}D_{tt}} < 0 \text{ if } S_{DD} D_{tD} < 0 \quad (16)$$

and

$$\frac{dt}{dD/R^t} = \frac{\pi_{tD}[R^C(\cdot) - R^P(\cdot)]}{\pi_{tt}[R^P(\cdot) - R^C(\cdot)] - E_{tt}} \begin{matrix} \geq 0 \\ \leq 0 \end{matrix} \begin{matrix} \geq 0 \\ \leq 0 \end{matrix} \text{ if } \pi_{td} \begin{matrix} \geq 0 \\ \leq 0 \end{matrix} \quad (17)$$

In (16) there are diminishing returns to deterrence,  $D_{tt} < 0$ , holding the other argument (aid) in the security function constant, the denominator is negative. Also  $Z_{DD} > 0$ . The reaction function for the outside power will be negatively sloped as long as the foreign government believes that deterrence reduces terrorism (the converse of  $t$ ). In (17),  $\pi_{tt} < 0$ , there are diminishing returns to the strategy,  $t$ , and  $E_{tt} > 0$ . If the rebel (or terrorist) group is militant, more external deterrence will lead to its increasing its terrorist activities,  $\pi_{tD} < 0$ , and the reaction function will be negatively sloped, as in Figure 2. For the more easily deterred type of rebels, the reaction functions are positively sloped. We will concentrate on cases where the external sponsor is hawkish, and the terrorists are militant.

Figure 2  
External sponsor-terrorist interaction



### 3.2 An increase in the government's fighting efficiency (a rise in $\mu$ )

There are a variety of reasons for an increase in the government's capabilities against the rebels. One reason is an increase in its willingness to strike at the rebels, despite human rights implications, or because it perceives that it will attract less opprobrium in the international community. As noted earlier, fighting the rebels includes torture, incarceration and interrogation, in addition to conventional warfare.

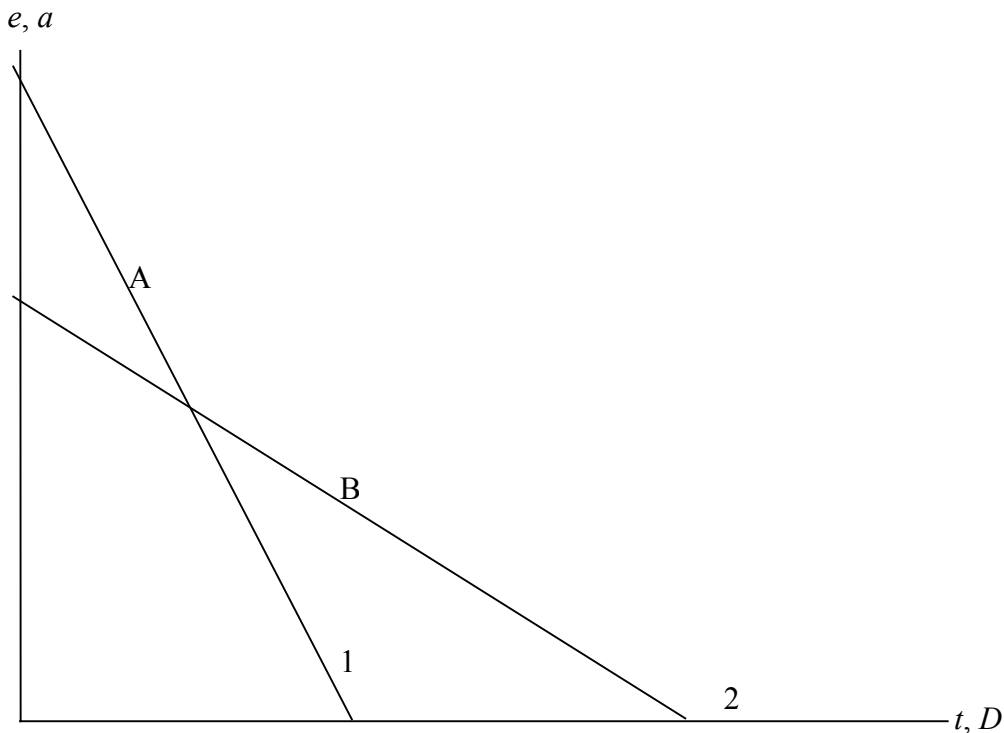
In Figure 1 the reaction function of the government  $R_1^G$  shifts leftwards to  $R_2^G$ , as there is less incentive to be peaceful ( $a$ ) for each level of  $e$ , see equations (1)-(3). A similar line of reasoning applies to the rebels, see equations (5) to (7), and the rebel reaction

functions shift down from  $R_1^R$  to  $R_2^R$ . The new equilibrium will have shifted from A to point B in Figure 1 with a decline in both  $a$  and  $e$ , but a greater decline in  $a$  relative to  $e$ . This is because there will be an increase in terrorist activity (decline in  $t$ ), see equation (8). In Figure 2 the rebel reaction functions move down from  $R_1^r$  to  $R_2^r$ . But the external power will want greater deterrence, and hence its reaction function moves up from  $R_1^S$  to  $R_2^S$ . Once again the new equilibrium is at point B in Figure 2 with greater  $D$  and lower  $t$  (more terrorist attacks against the outside sponsor). In summary an increase in the government's fighting efficiency or determination to strike at the rebels raises both rebel fighting against the government and more terror-type attacks against the external sponsor's interests within the budget constraint of the rebel group.

### 3.3 An increase in the cost of peaceful effort amongst the rebels (a rise in $E_e$ )

This represents a decline in the cost of peaceful effort ( $E_e$ ) against the state, relative to the outside sponsor from (9) and (10). This means that for the rebels it pays more to fight the state, and increase their peacefulness vis-à-vis the outside sponsor. It could be caused by increased political weakness within the government, or a fall in the cost of undertaking military action against the state. In Figure 3 the slope of their budget constraint shifts from the budget line indicated by 1 to 2. From point A, the new equilibrium could be at point such as B in Figure 3, with less terrorism (lower  $t$ ).

Figure 3  
Rise in the cost of peaceful effort vis-à-vis the state



### **3.4 An increase in the cost of terrorist activities (a fall in $E_t$ )**

This means that terrorist acts are more expensive,  $E_t$  has declined and less  $t$  will be chosen. Analytically, Figure 3 applies, and the budget line shifts from 1 to 2, and more  $t$  is chosen at point B. The rebels may re-direct their belligerence towards their domestic foes.

It has to be borne in mind that deterrence is direct, involving for example, proscription, seizing funds, facilities, bans and outright war on terrorists. Raising the cost of terrorism (lowering  $E_t$ ) is indirect, and often impacts on others such as bankers and arms merchants; it raises the price of intermediate inputs into terrorism, such as making weapons more expensive, raising difficulties of accessing offshore funds and so on. The distinction between deterrence and raising the cost of terrorism is not at all clear cut. Seizing or proscribing the sources of the finance of terrorism may only be a temporary inconvenience to the rebel group, as powerfully motivated political causes imbued with a deep sense of humiliation will always find new sources of finance. This is different from attempting to halt the flow of finance associated with civil wars that are essentially contests over resource rents, such as the revenues associated with conflict diamonds in Angola and Sierra Leone (see Addison, Le Billon and Murshed 2001).

Economic development and income growth shifts up the budget line in Figure 3, and causes more peaceful behaviour overall towards both internal and external opponents. This argument also applies to the government side. Higher income levels encourage the peaceful resolution of disputes, as the opportunity cost of violence increases with wealth and the various parties to the dispute may become more risk averse. Furthermore, the country becomes more interdependent with the outside world in terms of finance and trade, and has much more to lose from war with other countries (see Polachek 2002).

### **3.5 A rise in rebel intrinsic motivation to fight the state ( $\theta$ )**

A rise in the intrinsic motivation to fight the state by the rebels could arise because of acts of brutality or torture or some other misdeed by the government towards the rebels. It will shift the rebel reaction function down in Figure 1 indicating less  $e$ , and more fighting against the state at point C. Rebel activities against the state's external sponsor will, however, decline. This is indicated by an upward movement in the rebel reaction function in Figure 2, and the final equilibrium is at point C with less deterrence and terrorism (more  $t$ ).

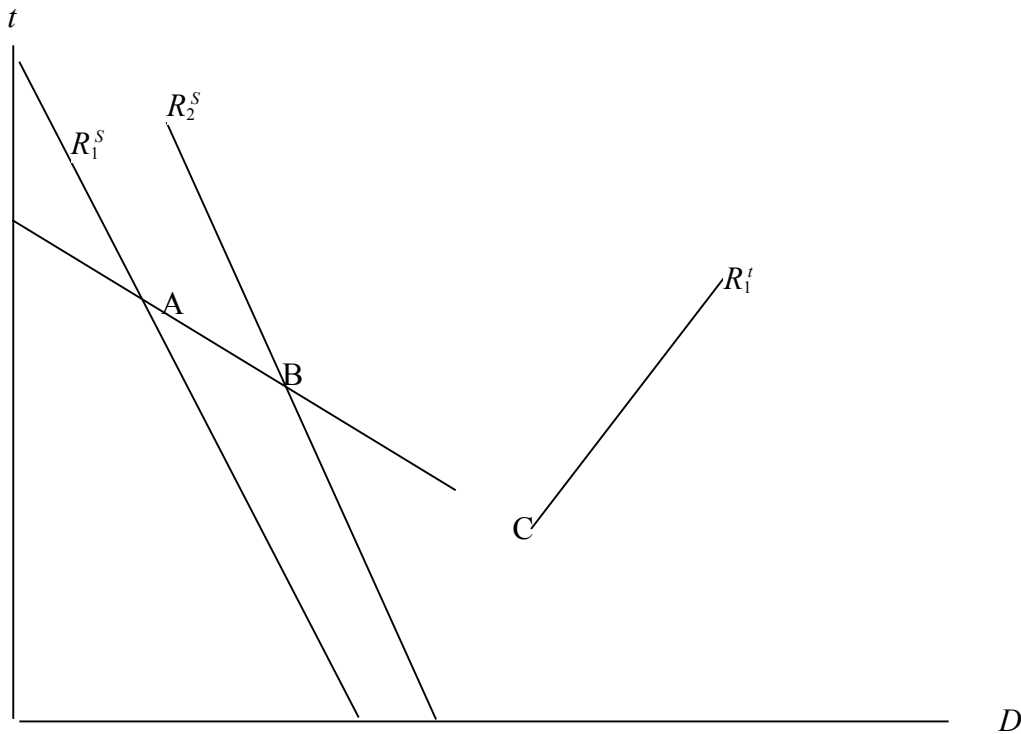
### **3.6 A rise in relative cost of giving aid to the government ( $Z_A$ )**

The new government in the country with the domestic dispute may be less amenable to implementing the bidding of the donor and the conditionality associated with aid ( $A$ ). It also may be more belligerent and inclined to fight the rebels. This is often the case following a military coup. Then aid is less effective in reducing conflict, and the credibility of any transfer to the rebels is lower. Analytically Figure 3 applies, the budget line rotates from (1) to (2). The external sponsor is compelled to employ more deterrence at a point like B in Figure 3. There will be greater violence, both in the intrastate civil war and transnational terrorism contexts.

### 3.7 A more conservative (hawkish) outside sponsor ( $\gamma$ )

The election of a conservative government, such as a Republican administration in the USA, means that these conservatives may derive a greater marginal utility from combating terrorism. We depict this in our model as an increase in the shift parameter  $\gamma$  in (11). Also events such as those of 11 September 2001, may outrage the public in the foreign country and can raise  $\gamma$ . The sponsor's reaction function  $R_1^S$  shifts out to  $R_2^S$  along  $R_1^t$  indicating a greater preference for deterrence,  $D$ , for every level of  $t$  in Figure 4. At this juncture the 'terrorists' type matters. If the group is more easily deterred, then the reaction function is upward sloping (not shown in Figure 2). This sort of motivation may be applicable to the less ideologically ardent, and more bandit-like terrorists. It can be argued, however, that for a deeply humiliated rebel group only a very high level of deterrence will cause them to reduce armed struggle. Thus we may posit, that rebels react to increases in deterrence, when the overall stock of deterrence against them is low with more violence, relenting only at very high levels of proscription. Thus, in Figure 4 the terrorist reaction function is first negative (recall more  $t$  means less terror), and then becomes positive after a discontinuity. The external sponsor may increase deterrence, but it may not work in reducing acts of terror; at point B,  $t$  has fallen meaning more terrorist acts against the outside power. Deterrence works at only very high levels, beyond point C in Figure 4,<sup>4</sup> which may be very expensive or

Figure 4  
Changes in terrorist functions



<sup>4</sup> This implies a discontinuity in the rebels or terrorists reaction function:  $R_1^t$ .

not acceptable to the citizenry of the foreign sponsor unless there is a 11 September type attack. This result has resonance with Wintrobe's (2002) paper on terrorist motivation. He argues that small changes in 'relative prices', deterrence in our model, will not deter terrorists in undertaking acts such as suicide bombing. Similarly, Frey and Lüchinger (2002) argue that deterrence may backfire and lead to greater acts of violence.

A policy implication that arises from our result, and the work of Frey and Lüchinger (2002), as well as Wintrobe (2002), is the desirability of the reduction of the collective humiliation (long-standing political grievances) that causes terrorism. Basically this means the political and economic resolution of the problems that are at the root of terrorism, civil war and domestic disputes in developing countries; see, Murshed (2002) on the breakdown of the social contract that leads to civil war, and the necessity of reconstructing it if peace is to be durable.

#### **4 Conclusions**

We have modelled transnational terrorism as a three-way strategic interaction involving a government that faces armed opposition at home, which may spill over in the form of acts of terrorism by the state's opponents against the government's external sponsor. We believe this to be a true reflection of much of present day terrorism, see also Doran (2002). There is also a widespread belief amongst many observers that many of today's terrorist groups, especially Islamic ones, possess deep intrinsic motivation born of a long standing and deep sense of collective humiliation. If that is the case, then increased deterrence towards them may only serve to harden their resolve to fight on (see Wintrobe 2002). Reducing their willingness to strike, at the equally loathed domestic government and its foreign sponsor, will require an enormous amount of retaliation and deterrence; levels that may be unacceptable to the nationals of the external power, barring events such as on 11 September 2001. Also increases in the government's ability to fight or persecute the rebels could lead to a global and general increase in violence. Increasing the cost of intermediate inputs into terrorism, such as increasing scrutiny on offshore banking, may have the desired effect, but only temporarily. Motivated rebel and terrorist groups are extremely innovative in raising finance for their war efforts, and the use of the *hawala* system of informal international financial transfers is highly effective and difficult to police (see Addison, Le Billon and Murshed 2001).

We have shown that purely military solutions can backfire. The real solutions to terrorism lie in the economic and political spheres. This means raising economic growth (and reducing macroeconomic instability) so that incomes and employment opportunities increase, thereby reducing the frustrations of young unemployed males who are otherwise ready recruits for terrorist organizations. Also, increased economic interdependence with the outside world through formal trade etc. generally induces peace (Polachek 2002). Political action is needed at two levels, involving the removal of exclusion and humiliation. Conflict and open civil war often emerge because of the breakdown of the social contract, that is the peaceful way of resolving disputes, and a just, as well as inclusive system of distributing power and economic resources (Murshed 2002). After all, the main quarrel the terrorists have is with their venal and unrepresentative governments. Thus, it is essential to rebuild the social contract to remove terrorism long-term. Furthermore, many societies and groups are willing to go



to great lengths and to sacrifice themselves out of a sense of deep humiliation (see Lindner 2001 on this). Addressing these issues are equally important to a permanent solution to terrorism; economists, rational choice theorists and policymakers ignore this deep motivation at their own peril.

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