

# The Investment Problem in Terrorism

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Evidence from early terrorist groups reveals a structural equivalence between extortion and terrorism. This allows us to draw conclusions from the theory of extortion that can be applied to a theory of terrorism concerning the role of repeated play in the viability of extortion. It also enables us to analyse the role of commitment in destroying the extortionary organization.

## INTRODUCTION

Terrorism<sup>1</sup> is an old, even ancient, phenomenon, going back more than a thousand years. A look to the *Assassins*, one of the oldest and most successful terrorist organizations, reveals something about the nature of terrorism. Rapoport (1984), who compares this group with two other ancient and enduring terrorist groups, describes Assassins, who were active from 1090 to 1275, as a group that ‘seriously threatened the governments of several states, especially those of the Turkish Seljuk Empire in Persia and Syria’. They used their threats to prevent other leaders from conquering their territory, and to influence other political leaders in religious matters, particularly leaders from the Muslim world; they also used threats to extort tribute from other political leaders of their time.

The Assassins’ tools of extortion are discussed in Lewis (1967). Their leader could rely on a group of well educated and highly skilful young people who were able to penetrate the political sphere of their time and who were willing to kill leading political figures in public if ordered to do so. The public element in terrorist attacks is important, because it enables such assassins to inform not only the state, which is the actual victim of the attack, about the group’s power, but also other groups which could be similarly extorted. The recent literature on terrorism has emphasized the role of the modern mass media in spreading information about successful attacks. However, the example of the Assassins shows that a carefully organized terrorist attack could achieve similar publicity without the modern mass media.<sup>2</sup>

The Assassins typically found ways to gain access to their targets, and to become these targets’ trusted officers, ministers or servants. Even more important, they gained the reputation for being able to attain, positions among the intimates of the leader who was the target of extortion. The following anecdote reported by B. Lewis illustrates this very well:

Even more startling is a story told by Kamal al-Din on the authority of his brother: ‘My brother (God have mercy on him) told me that Sinan [the Assassin leader at that time] sent a messenger to Saladin (God have mercy on him) and ordered him to deliver his message only in private. Saladin had him searched, and when they found nothing dangerous on him he dismissed the assembly for him, leaving only a few people, and asked him to deliver his message. But he said: “My master ordered me not to deliver the message [unless in private].” Saladin then emptied the assembly of

all save two Mamluks, and then said: "Give your message." He replied: "I have been ordered only to deliver it in private." Saladin said: "These two do not leave me. If you wish, deliver your message, and if not, return." He said: "Why do you not send away these two as you sent away the others?" Saladin replied: "I regard these as my own sons, and they and I are as one." Then the messenger turned to the two Mamluks and said: "If I ordered you in the name of my master to kill this Sultan, would you do so?" They answered yes, and drew their swords, saying: "Command us as you wish." Sultan Saladin (God have mercy on him) was astounded, and the messenger left, taking them with him. And thereupon Saladin (God have mercy on him) inclined to make peace with him and enter into friendly relations with him." (Lewis 1967, p. 116n)

The case of the Assassins illustrates a number of relevant aspects of terrorism. First, terrorism can last a long time; in the case of the Assassins, the group was active and successful for nearly 200 years. Second, credibility is crucial for its working, and the source of such credibility lies in the investment in an effective organization combined with visible violent acts of punishment. As Lewis writes,

There were many such sects and groups before the Ismailis [Assassins], but theirs was the first to create an effective and enduring organization. (Lewis 1967, p. 128)

This case in which an organization used the same tools for both political aims and plain extortion also shows that terrorist threats work in similar ways to extortion, and a careful study of how extortion works may help us to understand terrorism. Further, it shows that terrorism or extortion requires an active choice of whether or not to invest in building an organization that is able to launch successful attacks, and the formal analysis that follows will focus on the information and commitment aspects of this choice.

The 'economics of terrorism' is an established field. A comprehensive survey on terrorism research by Enders and Sandler (1995), examines both empirical and theoretical work on terrorism, and Henderson (2001) provides an interesting reference guide.<sup>3</sup> As has been discussed in this literature, terrorist attacks reduce aggregate wealth and/or welfare and therefore should not occur in a perfect Coasian world. It is important to isolate causes of violence from both a positive and a policy-oriented point of view. Scott (1989, 1991), for instance, considers terrorists who are uninformed about the type of government they are threatening, and Lapan and Sandler (1993) consider terrorists who have private information about their own stock of arms and use part of this stock in a first attack, to signal their strength. These information asymmetries can cause violence. The information asymmetry will be considered with respect to the terrorist group's investment choice.

A crucial difference from this standard credibility problem with type uncertainty is that the terrorist group's type is endogenous and is determined by its choice of investment in the ability to attack. Owing to the structural similarities between extortion and terrorism, I can draw on results in Konrad and Skaperdas (1997). However, the present analysis contributes over and above that paper in several respects. First, I here consider analytically repeated extortion of the same victim, and extend the horizon to infinity, with the option to invest not only initially, but also in all future periods. This extension is straightforward and does not change the qualitative results. Second, I allow for

an option to destroy or weaken the terrorist organization after each successful attack. I show that this option, together with unobservability, removes the ability of the terrorist group to benefit from repeated interaction and leads to a no-extortion equilibrium.

## I. THE INVESTMENT CHOICE

The analysis starts with a simple static full-information framework. Suppose there are two players, S and T. For concreteness, S is a state government that fully controls a region, and T is an interest group in this region that desires regional independence. Here, T does not refer to single teams that hijack an airplane or take hostages, but to a larger association that will often consist of an official and legal political group and one or several clandestine groups, but will be considered as one homogeneous decision-maker.<sup>4</sup>

Let the degree of regional independence be measured by  $x \in [0,1]$ , with  $x = 0$  characterizing full control by S, and  $x = 1$  characterizing full independence. In *stage 1* player T chooses whether or not to invest in building up a network or an organization that allows T to carry out acts damaging to player S at zero further cost. The investment cost required for this punishment device is  $e$ . That is, T chooses its investment expenditure from the set  $\{0, e\}$ . In *stage 2* player T approaches player S and demands a given amount  $\bar{x}$  of independence. For simplicity, the size of this  $\bar{x}$  is exogenously determined and is not a matter of T's choice. In *stage 3* player S decides whether or not to comply. If S complies, it assumes a cost of  $C(\bar{x})$ , and the game ends. If S does not comply, then in *stage 4* player T carries out an attack, if and only if in *stage 1* T invested in building up an appropriate organization for carrying out the attack at zero cost. If the attack is carried out, it causes damage to player S equal to  $D > C(\bar{x})$ . Investment and successful extortion takes place in the equilibrium if, and only if,  $\bar{x} > e$  and  $D > C(\bar{x})$ .

The relationship between T and S is made more complicated by a number of problems that can lead to violence as an equilibrium outcome. Most of these problems can be classified as information problems or commitment problems (see Fearon 1995). I will focus on a particular information problem related to T's investment choice and will discuss issues of commitment later, and only briefly.

### *Unobservable investment choices*

Suppose S cannot observe T's choice of whether to invest in a network that will make it feasible and credible for a successful punishment attack to be launched if S does not comply. T chooses its ability to carry out an act of punishment at no further cost, but the state cannot observe this choice, and the actual choice can be revealed only in the event of a punishment act.

For the one-shot game outlined above, this unobservability changes the outcome. S must act on the basis of some expectation about whether or not T has made the investment, and not on the basis of the actual investment decision. In this case it becomes a dominant strategy for T not to invest, regardless of how small (but positive) the investment cost  $e$  is, and this makes it

optimal for S not to comply with any demand made by T. Extortion breaks down in the one-period context if the investment choice is unobservable.

*Repeated interaction*

Repeated finite interaction can make the extortion equilibrium re-emerge. Konrad and Skaperdas (1997) have shown this in a context in which a finite sequence of victims is approached by the extortionist. Intuitively, with two extortion periods it is no longer a dominant strategy not to invest, because investment or non-investment is revealed once the state refuses to comply, and this makes the state comply in future periods. Hence, by investing prior to the first extortion period, T can induce extortion payments that are at least as high as what S will pay given that S has learned that T has invested.

More formally, introducing a discount rate, an infinitely repeated extortion game is described in Figure 1. In period 0 in *stage 1*, T decides whether to invest and spend  $e$  on creating a network or organization, or to invest nothing. The investment probability in period 0 will be denoted  $q_0$ . As in the finite horizon case, this investment establishes a punishment mechanism that works in all future periods in which T carries out acts of punishment at zero further cost if

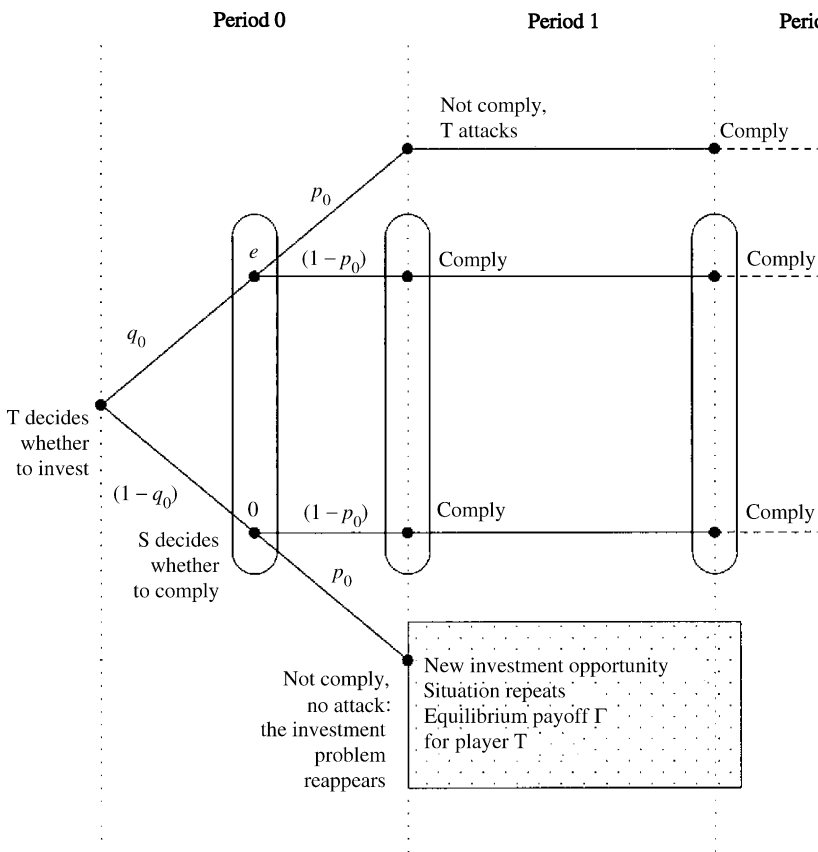


FIGURE 1. The infinitely repeated game.

(and only if) S did not comply. The zero cost of maintaining the mechanism is for simplicity, and some maintenance cost could be introduced. It is however important for the results to sustain a sufficiently low depreciation of investment.

In *stage 2*, T asks for a political favour. This favour is valued at  $\bar{x}$  by T and its size is again exogenous and time invariant, and S's cost of granting this favour in the respective period is  $C(\bar{x})$ ; hence the favour is reversible. These assumptions are mainly to eliminate the option of using the choice of  $x$  as a signal to open up a large set of equilibria and distract from the investment problem considered here; however, they also rule out several interesting issues that will be briefly discussed in Section III. In *stage 3*, the state decides whether to comply or to refuse to comply. Let  $p_0$  denote the probability with which the government decides to refuse to comply in period 0. In *stage 4*, if the government refuses to comply, T will carry out an attack if, and only if, it is able to carry out such an attack, i.e. if it has invested in building up its organization. For simplicity of exposition, I assume that the terrorist attack is triggered by a refusal to comply, instead of making this a matter of choice. The damage that is inflicted to the state if the act of punishment occurs is again denoted  $D$ . Accordingly, if this happens the gang's investment will be revealed and the government will comply in all future periods. If T has not invested in period 0 this too will become known at this stage as no damage will be inflicted on S in this period. From here, the game starts from the beginning again in the sense that T can decide again whether or not to invest in building up its terrorist organization at the beginning of period 1. Further, it may be reasonable to assume that compliance is an irreversible decision, or to select a particular equilibrium path for the continuation games with which the state complied in a period  $t$  and assume that the state, having complied once, will comply in all future periods.

Denote  $\Gamma$  the equilibrium payoff of player T, and let  $1/(1+r)$  be the discount factor of both players. T is indifferent between investing and not investing in period 0 if

$$(1) \quad -e + (1 - p_0) \frac{\bar{x}}{r} + p_0 \frac{1}{1+r} \frac{\bar{x}}{r} = \Gamma = (1 - p_0) \frac{\bar{x}}{r} + p_0 \frac{1}{1+r} \Gamma.$$

The left-hand side of (1) is T's payoff from investing. T bears the investment cost  $e$ , and, with probability  $(1 - p_0)$ , receives an annuity of size  $\bar{x}$  which has a present value equal to  $\bar{x}/r$ . With probability  $p_0$  the state refuses to comply in period 0, and this triggers the attack and reveals to the state that T has invested. Accordingly, the state will comply in all future periods from period 1 onwards. The right-hand side of (1) is the present value derived from not investing in period 0. In this case there is also a probability  $(1 - p_0)$  by which the state will comply, leading to a flow of benefits with a present value equal to  $\bar{x}/r$ ; the remaining probability,  $p_0$ , is that S will not comply. No attack occurs. It therefore becomes observable that T has not invested. At this point, the situation is similar to the one in period 0. T may reconsider whether or not to invest, and it should be able to generate the same equilibrium payoff from the extortion game starting one period later.  $\Gamma$  can be eliminated from these equations and the resulting equation can be solved for  $p_0$ .

The state is indifferent about complying or refusing compliance if T's probability for having invested fulfils

$$(2) \quad \frac{C}{r} = \frac{1}{1+r} \frac{C}{r} + q_0 D.$$

This makes use of the consideration that in the period after non-compliance, whatever the outcome is, the government will again be in a situation of indifference between compliance and non-compliance; it assumes that the government will comply in this later period. I summarize this result as follows.

*Proposition 1.* If investment is unobservable and T has a new investment opportunity in each period, a perfect Bayesian equilibrium with infinite time horizon and discount rate  $1/(1+r)$  is given by (1) and (2) if the investment cost  $e > 0$  is sufficiently small.

Note that any policy that changes  $e$ ,  $C(\bar{x})$  or  $D$  may be useless if it does not eliminate the extortion equilibrium altogether, and a policy that increases  $C(\bar{x})$  and does not eliminate the mixed strategy extortion equilibrium is wasteful.

In the contexts considered above, non-compliance with T's demands may, but need not, trigger an attack. The attack will occur if T's network is capable of carrying out the attack. If T successfully attacks, this changes the prior beliefs regarding T's investment choice, and the state will then fully comply with T's demands. This result explains why the government may dislike successful attacks (apart from the damage they cause) and why T enjoys and celebrates successful attacks: they establish T's reputation.

### *Destruction*

The state may try to destroy T's network and its ability to carry out successful attacks. Indeed, an empirically relevant aspect of terrorism is that the state will intensify its anti-terrorist effort when an attack has taken place and will try to retaliate. In the framework considered here, this retaliation could be seen as an attempt to destroy T's network and its ability to carry out future attacks, for instance because T could increase its demands, given that it has successfully established its ability to carry out attacks. After destruction, it is then up to T to consider whether to invest from the beginning, or to abstain from investment.

Note that the ability to destroy the network, together with an *ex ante* commitment to destroy T's investment each time a successful attack has been launched, destroys the value of the information revealed about T's ability to attack successfully. The benefit of having invested compared with not having invested is that the state that refused to comply will comply if T successfully proves its power, and may continue to refuse to comply if T does not attack successfully. This benefit does not accrue in the period in which refusal and attack took place, but only in later periods, and is based on the change in the state's perceptions about T's choices. If the state can commit to destroying the investment once the investment has been revealed, the future benefit of investment can never materialize. This then implies that no investment will ever take place.

The existence of a no-extortion equilibrium is independent of whether or not T has the ability to reinvest in each period. If the group anticipates that the network will be destroyed after any successful attack, it will never pay to invest.

Also, for this argument to apply it is not necessary to assume that the probability of success in destroying T's network, or the probability by which destruction occurs, must be equal to 1: it is enough to assume that these probabilities are sufficiently high to induce the state to not comply next period. The following proposition summarizes this result.

*Proposition 2.* If the state has a technology that can destroy T's organization, and can commit to using this technology as a reaction to an attack with sufficiently high probability, with endogenous and unobserved investment by T an equilibrium without extortion results.

Unobservability of investment in an organization that installs an extortionary threat interacts with governmental effort to destroy the functioning of this organization. The observability problem means that the investment needs a persistence of at least two periods to induce an equilibrium with extortion. A firm commitment to destroy the organization, or to reduce the probability that the organization will continue to function whenever its functioning has become visible, leads to an equilibrium with no extortion.

It remains an open question how such commitment could be achieved, and whether it is possible to carry out effective destruction of the network. Moreover, these policy conclusions should be taken with great care, as they are based on an analysis that addresses only one aspect of extortion, as will be discussed in the next section.

## II. IMPORTANT NEGLECTED ASPECTS

The present analysis abstracts from many aspects that are important, and possibly crucial, in describing terrorism, and some of these aspects should be mentioned here more explicitly.

I do not consider the internal structure and organization of a group that may consider the formation of a terrorist organization, or of existing terrorist organizations. To understand the internal structure and organization is important for understanding the formation and stability of such groups, and for the design of policies aimed at destabilizing or destroying such organizations. Polo (1995) considers the issue of competition between rival illegal organizations. Garoupa (1999) takes as a starting point that all members of criminal organizations risk being punished; that not only record-keeping and auditing, but also employees' information are possible threats to the business; and that contracts in this business are not enforceable in a court of law. He provides an interesting analysis that yields counterintuitive results regarding the merits of severe punishment or plea bargaining with subcontracted offenders.

Separation movements often consist of an official and legal political representative or organization pursuing its aims, and one or several clandestine groups or organizations that may be able and motivated to carry out violent

attacks. It is unlikely that the official organization is able to fully control the terrorist organization, and this generates several issues of commitment in an intertemporal context. It may also further complicate the issue of finding an efficient agreement with the official separatist party, even if such negotiations are feasible. The duality between terrorist activities and legal political representation also raises the issue of whether or not a terrorist should be able to become a leading figure in legal politics. To offer such an exit option to the terrorist group might be beneficial *ex post*, but it could increase the individual expected *ex ante* benefits from becoming a terrorist. Frey and Luechinger (2003) discuss this. They claim that the benefits of exit options exceed their disadvantages.

Suppose an efficient agreement between a separatist movement and the government is feasible and involves some level of independence. Once the new level is reached, the movement may increase its demands. The situation is similar to the blackmailing problem that has been considered by Leppämäki (2003). He shows that an equilibrium may arise in which the blackmailer is able to extort benefits from the victim that relate to the victim's willingness to pay for a delay in the revelation of the information that is used as the blackmailer's threat. This suggests a slow gradual reform towards independence as an outcome. However, there is one major difference: giving in to separatist demands may change the organizational cost of the clandestine groups and may make attacks easier or more difficult; or it may change the internal coherence and motivation among potentially violent group members, or the relationship between the separatist party and the clandestine organizations. Accordingly, granting some independence may have lasting implications for the future power distribution and therefore lead to renegotiations. Fearon (1995) explains why negotiations may fail to reach an efficient outcome, and may lead to violence, if the agreement causes such changes in the distribution of power in the future.

Similarly, I considered the state as a perfect agent on behalf of a homogeneous population that does not include the terrorists. The state is not a perfect agent; nor is the population homogeneous, particularly in many regions where terrorist groups are active. Tensions between the government and some of the country's population are important for the functioning of the terrorist threat. This is most obvious in situations in which a large share of the population sympathizes with the terrorist group, which may be the case more frequently in dictatorial states. Another aspect of this is the trend for giving up civil liberty rights under the terrorist threat. While it is not perfectly clear what the policy failure is, the loosening of privacy laws and the willingness to give up important human rights, even when these changes do not have an impact on the terrorist organizations and their operations, is puzzling.<sup>5</sup> It seems to be easy for governments to convince their citizens that more surveillance and less privacy is an appropriate response to a terrorist attack.<sup>6</sup> Perhaps a better understanding is needed of why privacy laws can improve welfare in a world in which the government is not a perfect agent on behalf of its citizens.<sup>7</sup>

The terrorist organization operates within a larger and heterogeneous society. Feelings towards the terrorist group of subgroups of this society, public opinion and the media matter for the outcome. For instance, factors

such as public opinion may affect terrorists' choice of targets or the type of their attacks.

Political organizations differ with respect to their resistance to extortion. A state that gives in to the demands of one terrorist group may stimulate demands by other groups, and may make reputation building a more important issue, if asymmetric information about the government is taken into consideration.<sup>8</sup> This is true in particular of a central government that is confronted with demands from several separatist movements. Moreover, the organization of a government can be important in determining how it will react to an extortionary threat. Returning to the Assassins, Lewis (1967) describes evidence that the Assassins successfully extorted from the Christian King of Jerusalem. However, they were less successful with the Hospitallers and the Templars, which were organizations of knights who were, to some extent, subordinates of the King of Jerusalem:<sup>9</sup> not only did the Hospitallers and Templars refuse to pay tribute to the Ismaili, but the Ismaili were actually extorted from by the Templars. This difference is often attributed to the different types of government structure. The case reveals that organizational design matters for whether or not an organization is immune to extortionary threats, and this opens up an important question for future research.

In this paper only a small step towards putting terrorism into a wider perspective is made. Main emphasis is given to the view that investing in an extortionist organization must be seen as a matter of choice. On the individual scale, the trade-off between legal and illegal activities has been considered in the literature on crime and punishment, and an application of this in the context of hijackers is Landes (1978). Lundahl (2002) argues that the opportunity cost of becoming a terrorist should be an important aspect, and the World Bank (2002) emphasizes the importance of economic conditions such as income. Krueger and Maleckova (2002) claim that poverty and low education are not key factors causing terrorism and provide some empirical evidence for the importance of political conditions, long-standing feelings and frustration. The question of whether it is worthwhile to make the investment to form a complex organization has many dimensions.

### III. CONCLUSIONS

In this paper I have used the example of an early terrorist group to show that there is no clear-cut distinction between extortion and terrorism. The group was both a state and a non-state organization during different periods of its existence and used the threat of violence as an instrument to pursue political, religious and monetary goals. I used this structural similarity to draw conclusions from the theory of extortion for a theory of terrorism, concentrating on an information problem with respect to the extortionist group's decision concerning whether or not to invest in the ability to launch an attack. Repeated interaction becomes crucial for the existence of an equilibrium with extortion. This equilibrium also exhibits violence. Moreover, a strong commitment and ability to destroy the extortionist's ability to carry out successful attacks as soon as a successful attack has occurred leads to an equilibrium without extortion, even in the case with repeated interaction. However, these results should not be translated straightforwardly into policy

recommendations. The paper also discussed the fact that there are many further issues that prevent politics from reaching an efficient outcome in the context of terrorism.

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#### NOTES

1. Together with Thomas Schelling (1984, p. 315), I adopt the definition of violence in his dictionary that defines terrorism as 'the use of terror, violence, and intimidation to achieve an end'.
2. The symbiosis between terrorists and the media has been noted by many researchers (see e.g. Slone 2000; Nelson and Scott 1992). An early policy response has been formulated by Frey (1999), who suggests that the authorities always name several, preferably conflicting, groups as possibly being responsible for the act of terrorism, because this makes an individual terrorist attack less rewarding for each individual interest group.
3. The main issues in the empirical work are which macro factors can explain terrorist attacks (Enders and Sandler 2000; Sandler and Enders 2004; O'Brien 1996), the role and effectiveness of preventative measures, and the economic consequences of terrorism, e.g. for tourism (Enders and Sandler 1996; Enders *et al.* 1992; Abadie and Gardeazabal 2001). Some theoretical aspects are related to issues such as the terrorists' target selection problem, free-riding strategies of countries in an international environment (Lee 1988), negotiations with terrorists (Lapan and Sandler 1988) or the terrorist's choice problem of whether to become a hijacker (Landes 1978). Garfinkel (2002) considers how an external threat of international terrorism affects domestic redistributive conflict.
4. I will discuss this assumption further in Section III. I also abstract here from the fact that the government of a country may face a situation with secession movements in several regions. Consideration of, for instance, reputation will then enter the picture, leading to interesting questions that will not be addressed further here.
5. Frey (1999) has also expressed concerns about the great willingness to sacrifice human rights under the threat of terrorism. For the recent development in the United States, see Rathbone and Rowley (2002, p. 17).
6. There are examples of this in many countries. The United States has taken measures as a reaction to the 11 September 2001 terrorist attacks. In Germany, the terrorist group Rote Armee Fraktion caused a tightening of security laws, police and prosecution rights, and a reduction in privacy rights. Several other laws following a similar pattern have been enacted recently.
7. A step in this direction is made in Hylton and Khanna (2002) who argue that pro-defendant criminal procedures limit the abuse of government authority. Konrad (2001) shows that even government failure of a welfarist government may be reduced by information asymmetry between the government and private individuals.
8. In the particular problem considered in Section I, this aspect cannot be captured. The government's cost of compliance is exogenous and known. In this context, if the terrorist groups pursue independent goals, then each of the games between one of these groups and the government can be considered independent of the others.
9. The precise relationship is more complicated. Their main superior was the Pope, and the degree of autonomy was considerable; see e.g. Selwood (1999) for some details.

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