Institutional Constraints in Times of Crisis: Counter-Terrorism and Electoral Accountability

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Abstract

We develop a game-theoretic model of interactions among a government, a representative citizen, and the (non-terrorist) members of the community in which terrorists have their roots and derive several results. First, security can decrease whenever the government faces increased electoral incentives to provide it. Second, if the government can commit to a level of anti-terrorist activities, increased electoral incentives to provide more security always reduces the equilibrium probability of a terrorist attack. A central result of our analysis is that some constraints on government actions always improve security even when security is a country's only concern. We thus provide a new *security* rationale for laws and institutions that, at least to some extent, tie the hands of the government in its struggle against terrorism. Checks and balances on the government's antiterrorism actions, such as judicial review, can increase a country's security, even while directly inhibiting some anti-terror activities.

1 Introduction

A fundamental principle of liberal-democratic regimes, encapsulated in the words "a government of laws and not of men," prescribes that the powers of government be limited. Citizens and their elected officials are most inclined to cast this governing principle aside in times of crisis, and instead heed the old Roman maxim *inter arma silent leges* ("during times of war, the laws are silent"). Emergencies seemingly require more governmental discretion and flexibility of action, which in turn implies a relaxation of legal and constitutional constraints.

The responses of democratic societies to the 9/11 terrorist attacks illustrate the point. The attacks caused a rippling fear of vulnerability among citizens almost everywhere. To prevent large-scale catastrophic terrorist attacks, many democratic countries relaxed various restrictions on their governments' powers and adopted scores of aggressive policies, ranging from more frequent military interventions and tougher immigration policies to increased surveillance of ethnic and religious communities suspected of terrorist activity.

Most significantly, terrorist-related crises invariably lead democratic governments to concentrate their anti-terrorism efforts on the community associated with the terrorist group. With respect to Al Qaeda terrorism, for example, most countries identify the relevant community as Muslims. This community includes Muslims living in Muslim nations such as Yemen, Pakistan, and Saudi Arabia, as well the concentrations of Muslims in Western countries. The assumption, of course, is that Muslim terrorists feel safest plotting their strategies and methods of coordination among others who look like them and share a similar cultural background. From the government's perspective, therefore, even though the terrorists comprise a very small fraction of the community, it is the natural place to direct its anti-terrorism efforts.

Not only do the overwhelming majority of Muslims have no terrorist intentions, they can, and do, help the government to prevent terrorism in multiple ways. Long-term and most fundamentally, Muslim adults can socialize their children to reject terrorism. More immediately, they can express their opposition to radical activities directly to the potential terrorists; they can speak out publicly against violence-inciting speech; and they can provide information to the governments of the countries that could be attacked.[1] In short, non-terrorist members of the relevant community are indispensable, long- and short-term, to the prevention of terrorist acts.

That community members can prevent terrorism in a variety of ways complicates the simple idea that, in times of crisis, increased governmental intervention in the relevant religious or ethnic community enhances security. For although more aggressive anti-terrorism actions might indeed disrupt plots to attack, they might also alienate the non-terrorist members of the community,

[1]For example, the father of the Christmas "underpants bomber" contacted the US embassy in Nigeria in order to warn them about his son.

inducing them to become less inclined to act as socializing agents, public critics, or ever-present eyes for the government. In short, when the government (re-) formulates terrorism policy, it faces a potential tradeoff. Yet, especially in times of emergency, when government officials and citizens alike feel compelled to take decisive action, this tradeoff can go unnoticed or be ignored.

To illustrate this tradeoff, we develop a game-theoretic model of interactions among a government, a representative citizen, and the (non-terrorist) members of the relevant (cultural, ethnic or religious) community in which terrorists have their roots. The government, the representative citizen, and the (non-terrorist) members of the community all prefer to prevent a terrorist attack. However, a higher level of government anti-terrorist activity imposes a negative externality on all members of the community. The government also seeks reelection, and the representative citizen's decision to reelect the government depends on the government's success in foiling terrorist attacks.[2] Using this model to analyze how increased electoral demands for security affect terrorism prevention, we derive two implications.

First, we show that security can actually decrease whenever the government faces increased electoral incentives to provide it. The electoral pressure on the government to be successful in foiling terrorist attacks increases the level of anti-terrorism activities and, for a fixed level of activities by community residents to discourage terrorism, this increase reduces the probability of a terrorist attack. However, the alienation that arises as a side effect of the more aggressive governmental actions induces the (non-terrorist) community members to do less to reduce terrorism which has the potential effect of increasing the equilibrium probability of a terrorist attack.

Second, and more importantly, we show that if the government can commit to a level of anti-terrorist activities, increased electoral demands on the government to provide more security always reduce the equilibrium probability of a terrorist attack. However, we show that, because community members cannot perfectly observe the government's anti-terrorism activities, commitment cannot be achieved without explicit legal or institutional constraints on the government's capacity to act. A central result of our analysis is that some constraints on government actions always improve security even when security is a country's only concern. We thus provide a new *security* rationale for legal rules and institutions that, at least to some extent, tie the hands of the government in its struggle against terrorism. Checks and balances on the government's antiterrorism actions, such as judicial review, can increase a country's security, even while directly inhibiting some anti-terror activities of the government. In contrast, giving the government "all powers that it wants" is not

[2]The representative citizen in our model stands for the majority of citizens who reelect or cast out of office a liberal democratic government. From an electoral perspective, the majority of citizens is unlikely to bear the costs of increased surveillance that members of the racial or ethnic community bear, and thus will essentially ignore them. Because the community members are an electoral minority (at best), they lack power to influence the government's anti-terrorism decisions through electoral threats. In most Western democracies, for example, members of the Muslim community comprise a very small part of the total electorate.

optimal even when citizens care only about maximizing security.

In making our arguments we contribute to the political economy literature on terrorism. This literature has addressed several critical questions about fighting terrorism, including the structural determinants of terrorism (Li 2005; Abadie 2006; Blomberg, Hess, and Weerapan 2004; Enders and Sandler 2006), the optimal (or suboptimal) domestic or international counterterrorism policy (Enders and Sandler 1993; Rosendorff and Sandler 2004; Bueno de Mesquita 2005; Bueno de Mesquita 2007; Powell 2007a; Powell 2007b), radical mobilization (Bueno de Mesquita and Dickson 2007), terrorism recruitment and support (Bueno de Mesquita 2005; Siqueira and Sandler 2006), strategies to fight terrorism (Kydd and Walter 2006), among other topics. However, though nearly all prominent anti-terrorism policies following 9/11 assume that a more aggressive anti-terrorism policy results in more security, the scholarship has yet to determine the relationship between more aggressive governmental actions and the effectiveness of terrorism prevention.

The result that electoral pressures on the government to succeed in terrorism prevention can have a perverse effect on policy effectiveness is a more general conclusion. It applies to other policy areas that are not fully under the government's control when governmental activity affects the incentives of agents whose actions also influence the policy outcomes. This result contributes to the political economy literature on democratic accountability (Manin 1997; Fearon 1999; Besley 2005). Most of the literature analyzes the disciplining effect of elections on public officials and the conditions under which elections are sanctioning or selection mechanisms (Key 1966; Fiorina 1981; Manin 1997, Besley 2005; Fearon 1999). Our model differs from the existing literature in that the government does not have full control over achieving the desired policy outcome: the government strategically interacts with the community, and both their actions determine the success of terrorism prevention.

We proceed as follows. Section 2 discusses the incentives and constraints that democratic governments face when acting to prevent terrorist attacks. Section 3 presents a simple example with binary actions to highlight the main results. The general model and its analysis follow in Sections 4 and 5. Section 6 presents a parametric example. Finally, in Sections 7 and 8, we discuss the policy implications and conclude.

2 Democratic Governments and Terrorism Prevention

A core principle of democratic theory is that citizens hold their governments accountable at election times. Because providing security is one of the most important public goods, democratic governments will found it hard to maintaining popular support without effectively preventing terrorist attacks. Indeed, the empirical connection between successful terrorism prevention and reelection outcomes is strong. Using a large data set consisting of more than 800 elections in 115 countries over the period 1968-2002, Gassebner et al. (2007) show that the occurrence of terrorism increases the probability that the incumbent government is replaced at the next election.[3]

The government thus has electoral incentives to prevent terrorist attacks, and can adopt a range of domestic and international policies to this end. Internationally, the government can engage in military actions to disrupt the recruitment, planning, and training activities of terrorist organizations. The government can also choose various tactics to capture and interrogate suspected terrorists. For example, the CIA has used aggressive interrogation techniques under the premise that harsher interrogation leads captured terrorists to divulge more valuable information.

Domestically, the government can adopt various immigration and surveillance policies. Most Western governments have adopted tougher immigration policies after 9/11 to make it more difficult for terrorist groups to operate inside the country. For example, in the United States, the FBI working with the Immigration and Naturalization Service arrested nearly 800 individuals (mostly Muslims) for immigration violations during the initial investigation of the 9/11 terrorist attacks (Jacobson 2006). Western governments have also engaged in aggressive surveillance policies such as profiling of ethnic and religious communities suspected of terrorist activity, acting under the assumption that terrorists come disproportionately from these communities.[4]

However, the effectiveness of terrorism prevention also depends on the actions of the members of the communities in which terrorists have their roots. These communities consist mostly of people who do not wish to engage in terrorism. For example, regarding Al-Qaeda terrorism, a Gallup World Poll found that a significant majority of Muslims strongly opposes terrorism.[5] Similarly, studies of the attitudes of European Muslim communities suggest that they are overwhelmingly oppose to extremism and support democratic processes (**?**).

Community leaders and ordinary community members can take a range of actions to reduce terrorism. Community leaders can discourage fellow members from providing active and passive support to terrorist groups, thus reducing the terrorists' ability to operate and plan attacks. They can also actively discourage extremism and violent activities, thus increasing the costs of terrorism by making it a less acceptable activity. All community members can provide information to the government about suspicious activities as well as individuals who might be attracted to radical ideas, connected to terrorists, or actively planning a terrorist attack.[6] Indeed, numerous researchers and

[3]Gassebner et al. show that the probability of a government change depends on the severity of the terrorist attack. Terrorist attacks without casualties or injuries increase the probability of a government change by only 1.3%, while terrorist attacks with at least one casualty increase the probability of a government change by 20.3%.

[4]Theoretical work on profiling show that the optimal strategy for the government is to profile on the basis of the elasticity to crime in different groups (**?**).

[5]The poll is based on six years of research and more than 50,000 interviews of Muslims representing more than 90% of the world's Muslim community (**?**).

[6]For example, on Nov. 7, 2005, Australian authorities launched raids against suspected terrorists and arrested 17 men who were allegedly planning major terrorist attacks. The original tip-off came from the Muslim community of Melbourne, where someone notified police about the suspicious activities of a group of young men.

security officials have underscored this aspect of community intelligence. Wilkinson (2006) writes that co-opting the communities to provide intelligence is the "secret of winning the battle against terrorism in an open society."

When the government does not fully control terrorism prevention, more aggressive anti-terrorism actions pose a trade-off. In particular, because terrorists have the advantage of plotting in secrecy and hiding in their communities, the government cannot distinguish with certainty innocent individuals from terrorists. More aggressive anti-terrorism actions increase both the probability of disrupting and detecting terrorists as well as the probability of "false positives." As a result, community members without terrorist intentions are likely to be inconvenienced, subjected to duress or even killed. Government aggressive actions can create frustration and alienation in the community, jeopardizing its members' willingness to help terrorism prevention.

Anecdotal evidence suggests that aggressive anti-terrorism policies have had the effect of alienating the Muslim communities. In the United States, the press has reported that surveillance techniques authorized by the Patriot Act have alienated Muslim groups.[7] Muslim organizations have felt betrayed by a nationwide pattern of abuse and violations of their civil and religious rights including wide-spread mosque surveillance.[8] Similarly, the use of aggressive interrogation techniques at Guantanamo Bay and Abu Ghraib have caused anger and frustration in Muslim communities everywhere. For example, Johann Hari quotes Maajid Nawaz, a British-born islamist who moved to Egypt in 2001 and began recruiting students into radicalism: "There was an inhibiting sympathy for the victims of 9/11 – until the Bush administration began to respond with Guantanamo Bay and bombs. That made it much easier. After that, I could persuade people a lot faster."[9]

In the next section, we present an example of how increased electoral demands for security affect the effectiveness of terrorism prevention when both the government's and the community's actions determine its success. The example is simple so to show clearly the mechanisms at work.

3 A simple example

There are three players: a government, a representative citizen, and the (non-terrorist) community members. For simplicity, we will refer from now on to the (non-terrorist) members of the relevant (ethnic or religious) population in which terrorists have their roots as *the community*. Each player receives a payoff of 100 if a terror attack is prevented and a payoff of 0 if a terrorist attack occurs. In addition, the government receives a payoff of $R = 200$ if it is reelected.

The government chooses whether to set its anti-terrorism activities to either "normal" (denoted

[7] Christian Science Monitor, September 2009.

[8] Christian Science Monitor, March 25, 2009

[9] Johann Hari, "Renouncing Islamism: To the brink and back again", The Independent, November 16, 2009.

$\underline{s}$) or "aggressive" (denoted $\overline{s}$). The community chooses between a low level of (terror reduction) activities, $\underline{i}$, and a high level of activities $\overline{i}$, i.e $i \in \{\underline{i}, \overline{i}\}$. These actions translate into the probabilities $p(s,i)$ of a successful terrorist attack given in Table 1.

	$\underline{i}$	$\overline{i}$
$\underline{s}$	0.10	0.05
$\overline{s}$	0.08	0.03

Table 1: Probability of a terrorist attack

Note that high levels of s and i decrease the probability of a terror attack. The community's effort is important. A high level of community activity reduces the probability of an attack by 5 percentage points, while "aggressive" government activity (relative to "normal" activity) only reduces this probability by 2 percentage points.

The government's cost for aggressive anti-terrorism activity is $c_g = 3$ and the government's cost for "normal" activity is $c_g = 0$. The community's cost for low activity is $c_c = 0$ and the cost for high activity depends on the level of anti-terrorism government activity. If this level is normal, the community has the same cost, $c_c = 0$. In contrast, if the level of governmental anti-terrorism activity is high, the community incurs a cost of $c_c = 10$ if it chooses the high level of activity. This modeling assumption captures the idea that more aggressive governmental anti-terrorism actions impose a negative externality on the community, and the resulting alienation makes it more costly for the community to collaborate.

The representative citizen observes whether a terrorist attack occurs and decides whether to reelect the (incumbent) government. We want to analyze the effect of increased electoral incentives for the government to provide more security on the equilibrium probability of a terrorist attack. To this end, we compare two situations. In the first case, the representative citizen does not condition his or her reelection decision on whether there is a terrorist attack or not and thus the voter always reelects the government independently of the effectiveness of terrorism prevention.[10] In the second case, the representative citizen reelects the government if and only if a terrorist attack does not occur. We analyze each case in turn.

In the first scenario, the payoff matrix for the government and the community is given by Table 2.[11]

[10] One can imagine this as a situation before a major terrorist attack such as 9/11 occurs so that terrorism is not on the voter's "radar screen". The voter may then be unwilling to punish the incumbent government for a terror attack that is surprising for everybody.

[11] The payoffs can be derived as follows. Multiply 1 minus the probability of a terror attack (from Table 1) with the respective payoff from preventing an attack, and deduct the respective player's cost, if applicable. Finally, for the government, add the reelection benefit.

	$\underline{i}$	$\bar{i}$
$\underline{s}$	(290,90)	(295,95)
$\bar{s}$	(289,92)	(294,87)

Table 2: Payoff matrix without reelection concerns

The government has a dominant strategy: $\underline{s}$. The community's best reply to $\underline{s}$ is $\bar{i}$. Thus the unique Nash equilibrium of the game without reelection concerns is $(\underline{s}, \bar{i})$, and the equilibrium probability of a terrorist attack is $p^* = 0.05$.

In the second scenario, the payoff matrix for the government and the community is given by Table 3.

	$\underline{i}$	$\bar{i}$
$\underline{s}$	(270,90)	(285,95)
$\bar{s}$	(273,92)	(288,87)

Table 3: Payoff matrix with reelection concerns

The government has a dominant strategy: $\bar{s}$. The community's best reply to the government's strategy is $\underline{i}$ and thus the unique Nash equilibrium of the game with reelection concerns is $(\bar{s}, \underline{i})$. The equilibrium probability of a terrorist attack is $p^* = 0.08$.

Intuitively, the threat of being voted out of office if a terrorist attack occurs induces the government to do more of whatever is under its direct control and, as a result, aggressive antiterrorism activity $\bar{s}$ is a dominant strategy for the government. However, the government's aggressive antiterrorism action induces the community to do less to prevent terrorism, with the overall effect of increasing the equilibrium probability of a terrorist attack.

One way to interpret the perverse effect of increased electoral incentive is that it creates a commitment problem. To see the importance of commitment, consider a variation of the game in which the government moves first and the community second, after perfectly observing the government's choice. Applying backward induction, the community will choose $\bar{i}$ if the government chooses $\underline{s}$, and $\underline{i}$ if the government chooses $\bar{s}$. Consequently, the government's optimal action is $\underline{s}$, and the community's best reply is $\bar{i}$ along the equilibrium path. Thus, in the game with reelection concerns in which the government can commit and the community perfectly observes the government's action, the equilibrium probability of a terror attack is the same (for the given parameters of the game) as in the game without reelection concerns and, in both instances, lower than in the no commitment equilibrium $(\bar{s}, \underline{i})$.

The assumption that the community perfectly observes the government's action is key for obtaining the commitment equilibrium. To see this, consider again the sequential game just described, but now suppose that the community only receives an imperfect signal π correlated with the government's action. Specifically assume for simplicity that the signal takes two values $\pi \in \{\overline{s}, \underline{s}\}$, and, with probability $1 - \varepsilon$, is correctly indicating the action taken by the government. That is, $P(\pi = \underline{s} \mid \underline{s}) = 1 - \varepsilon = P(\pi = \overline{s} \mid \overline{s})$ for $\epsilon \in (0, 1)$. In this modified game, a strategy for the community is a function $i(\pi)$ for $i \in \{\overline{i}, \underline{i}\}$.

Can the commitment equilibrium $(\underline{s}, \overline{i})$ be a Nash equilibrium in this sequential game with imperfect observability? Let us assume that $(\underline{s}, \overline{i})$ is indeed a Nash equilibrium. By the definition of the Nash equilibrium, the community's strategy must be a best reply to $\underline{s}$ (the government's equilibrium action) and, as a result, the community must choose $i(\pi) = \overline{i}$ regardless of the signal received. Because the community's best reply does not depend on the signal, the government chooses $\overline{s}$ to maximize its payoff and, as a result, $(\underline{s}, \overline{i})$ fails to be a Nash equilibrium even if the signal is almost always correct. In fact, because in any Nash equilibrium, the community's action is independent of the signal, the only Nash equilibrium of this game for any $\varepsilon > 0$ is the no commitment equilibrium $(\overline{s}, \underline{i})$.

The government thus cannot commit simply by "moving first," unless the community *perfectly* observes its action. By their very nature, most anti-terrorist activities are secret, so that perfect observability cannot be implemented in the context of terrorism prevention. Therefore, the commitment equilibrium cannot be obtained without explicit institutional constraints on government actions. For example, a law that makes the action $\overline{s}$ illegal (assuming that the law is effectively enforced by the courts and everyone knows this) is an effective commitment device. Also, checks on the government's anti-terrorism actions can serve as an effective commitment device if they increase the government's costs for more aggressive actions. For example, suppose that the government needs to obtain judicial approval before engaging in aggressive anti-terrorism activity and that the additional cost of obtaining this approval is $c > 4$. Assuming that the courts approve the aggressive action, the cost for aggressive surveillance becomes $c_g > 7$. Now, normal anti-terrorism activity $\underline{s}$ is a dominant strategy for the government, and, therefore, the commitment equilibrium $(\underline{s}, \overline{i})$ obtains.

Also note that in the game with reelection concerns, all players are worse off in the no commitment equilibrium $(\overline{s}, \underline{i})$ in comparison to the commitment equilibrium $(\underline{s}, \overline{i})$, the government and the community get a lower expected payoff and the representative citizen is worse off as well because the probability of a terror attack increases.

In the next sections, we show that the above results hold in a more general game-theoretic model of an interaction between the government, the community, and the representative citizen.

4 The Model

4.1 Description

There are three players: the government, the community, and a representative citizen. The government chooses a level of anti-terrorism activity that we denote s which can be chosen from $s \in [0, \bar{s}]$. The community also chooses a level of activity to reduce terrorism that we denote by i, which can be chosen from $i \in [0, \bar{i}]$. The representative citizen makes a binary decision $v \in \{0, 1\}$, where 1 is interpreted as reelecting the government and 0 as electing the opposition instead.

We capture terrorism occurrence by a binary variable, T, that takes value 0 or 1; $T = 1$ denotes a successful terror attack and $T = 0$ its absence or failure. The actions of the government and the community translate into a probability of a successful terrorist attack, given by the function $p(s, i) \equiv \text{Prob}(T = 1)$. This probability decreases in both arguments, and it is convex in both s and i (i.e., there are decreasing marginal returns to terror prevention in both i and s: $\frac{\partial^2 p}{\partial s^2} > 0$ and $\frac{\partial^2 p}{\partial i^2} > 0$). We allow for the cross partials to take any value. The government's and the community's actions are substitutes if $\frac{\partial^2 p}{\partial s \partial i} > 0$ (i.e., an increase in i reduces the absolute value of the marginal effect of s). Conversely, s and i are complements if $\frac{\partial^2 p}{\partial s \partial i} < 0$.

We analyze three different game structures. In the first one, the government and the community make their decisions simultaneously. In the second one, the government moves before the community and the community perfectly observes the government's actions. In the third one, the government moves before the community but the community observes imperfectly the government's action. In all these game, the representative citizen observes whether a terror attack occurs and decides whether or not to reelect the government.

Let $U_g(T)$ be the government's direct payoff if the terror outcome is $T \in \{0, 1\}$. We assume that $U_g(1) < U_g(0)$ (i.e., the government prefers that no terrorist attack occurs). Denote the difference by $\Delta_g \equiv U_g(0) - U_g(1)$. The government also cares about reelection and receives an additional payoff R if and only if reelected. Finally, a function c_g measures the cost of the government from engaging in anti-terrorism activities. In summary, the government's expected utility is

$$(1 - p(s, i)) \cdot [U_g(0) + R \cdot E(v|T = 0)] + p(s, i)[U_g(1) + R \cdot E(v|T = 1)] - c_g(s), \quad (1)$$

where $E(v|T)$ is the reelection probability given the realization of T.

The anti-terrorism activity of the government, s, imposes a negative externality on the community. To formalize this notion, we assume that a higher level of s alienates community members and induces them to care relatively less about terror prevention. Technically, we assume that $\Delta_c(s) \equiv U_c(0, s) - U_c(1, s) > 0$ (i.e., the community shares the objective to prevent terror attacks), but $\frac{\partial \Delta_c(s)}{\partial s} < 0$ (higher level of anti-terrorism activities reduce the intensity with which the community members care about terrorism prevention). The function c_c measures the cost of the community for engaging in terror prevention activities. We assume that the cost function is strictly convex ($\frac{\partial^2 c_c}{\partial i^2} > 0$). In summary, the community's expected utility is

$$p(s,i) \cdot U_c(1,s) + (1 - p(s,i)) \cdot U_c(0,s) - c_c(i) = U_c(0,s) - p(s,i)\Delta_c(s) - c_c(i). \qquad (2)$$

Alternatively, we can formalize the intuitive idea of a negative externality of aggressive governmental actions by assuming that the community's preference for reducing terrorism is independent of s but that the community's marginal cost for terror prevention activities increases with an increase in s. That is, the community has a cost $c(s,i)$ with a positive cross-partial, $\frac{\partial^2 c}{\partial i \partial s} > 0$. Both formulations of the idea of a negative externality are plausible. In the analysis, we use the first formulation but the results are identical if we use the second formulation.[12]

The representative citizen receives utility $U_V(T,W)$ from reelecting the government, and utility U_V^0 from electing the opposition. Here, W is the performance of the government in areas other than terrorism prevention (such as the economic performance of the government), which is a random variable at the time that the government chooses s. For each $T = j$, $j \in \{0,1\}$, there exists a critical level w_j such that the government is re-elected if and only if $W \geq w_j$. We assume that U_V is decreasing in T and increasing in W, which implies that $w_0 < w_1$, i.e., if there was a terrorist attack, then voters require a stronger economic performance to reelect the government than if there was no terrorist attack. Let $q_j = \mathrm{Prob(W \geq w_j)}$ denote the probability that the voter reelects the government when $T = j$. Note that $w_0 < w_1$ implies $q_0 \geq q_1$, i.e. the reelection probability is higher as the government's successful in preventing a terror attack increases.

4.2 Discussion of modeling assumptions

Voter behavior. The main focus of our model is not to advocate a specific model of voter behavior and thus we model voters in a reduced form by assuming that the representative citizen's utility from reelecting the incumbent government decreases when a terrorist attack occurs (a terror attack lowers the reelection probability of the incumbent government). Several microfoundations are consistent with such a decrease in the reelection probability, which is all we need from the voting stage for the analysis of the interaction between government and the community.

A voting rule that reduces the reelection probability of the government after a terrorist attack is consistent with both a retrospective and a prospective voting behavior, and we do not take any

[12]To see this, note that we can write those parts of (2) that depend on i as $-p(s,i)\Delta_c\zeta(s) - c_c(i)$, where Δ_c is a constant and $\zeta(\cdot)$ is a positive and decreasing function (such that $\Delta_c(s) = \Delta_c\zeta(s)$. Dividing the objective function by $\zeta(s)$, an operation that does not change the optimal i, yields $-p(s,i)\Delta_c - \frac{c_c(i)}{\zeta(s)}$. We can think of the fraction in this expression as a function $c(s,i)$. Note that the fact that ζ is decreasing in s implies that this function $c(s,i)$ is increasing in s and satisfies $\partial^2 c/\partial i \partial s > 0$, just as in the example of Section 3.

position on whether the voters decide retrospectively or prospectively. In a retrospective voting interpretation, a terrorist attack decreases the voter's welfare, and the voter punishes the incumbent government for the reduction in his welfare. Alternatively, it is also possible to derive the same voter behavior in a framework in which voters are forward-looking and update their beliefs about the unknown level of the government's competence by taking past performance into account.

No terrorist organization as player. We do not have a terrorist organization as a strategic player in our game.This setup allows us to focus on the interactions among the electorate, the government, and the community. Nevertheless, we could extend the model by adding a terrorist organization whose possibility of attack depends on the strategies of the government and the community, and which has an unknown outside option. This terrorist organization would choose to attack if and only if the probability that the attack is successful given its resources, multiplied with the value that the terrorists attach to a successful attack, is greater than its outside option. We can think of the function $p(s, i)$ as a reduced form of such a model with a strategic terrorist organization.[13]

Utility function of the community. In our model, we define the relevant community as the (non-terrorist) community members who prefer to prevent a terrorist attack. However, depending on the application, it is possible to think of instances or to define the relevant community in such a way that it might have some preference for terrorism occurrence. For example, consider an occupied country such as Iraq or Afghanistan. If the occupation army fights insurgents in a more aggressive manner, the risk of hitting innocent civilians increases and this could lead to stronger alienation between the occupation force and the population and, as a result, the population could offer stronger support to the insurgents. We can easily accommodate such situations in our model. In these cases, the community's choice i can be interpreted as the absence of active support for the insurgent or terrorist organization, rather than the support for terrorism prevention. Higher levels of government suppression may induce some individuals to become terrorists, and increase the acceptability and respect for joining a terrorist organization. The trade-off between active insurgency fighting and risking the support of the population is the same as in our model.

[13]It may be interesting to integrate a terrorist organization as an active player in our model framework of electoral accountability when the terrorist organization is also interested in influencing the government's future policy and/or the identity of the government. Such a model would likely require a multi-period dynamic framework, and is left for future research.

5 Analysis

As mentioned, we analyze three different game structures. First, we analyze the game in which the government and the community make their choices simultaneously. Note that, with this game structure, the government cannot commit to a level of anti-terror activity that is not ex-post optimal from the perspective of maximizing the government's objective function. Second, in section 5.2, we analyze the game in which the government moves first and commits to an action while the community perfectly, and at no cost, observes the government's action. Finally, we return to the issue of whether it is plausible that the government can commit in Section 5.3, where we show that commitment would require *perfect* and *completely costless* observability of the government's actions by the community.[14]

5.1 Equilibrium

We now analyze the equilibrium of the simultaneous game. The representative citizen's behavior at the election stage results in an ex-ante expected probability that the government is reelected if there is no terror attack, q_0, and an ex-ante expected probability that the government is reelected if there is a terror attack, $q_1 < q_0$. Let $Q \equiv q_0 - q_1$ denote the equilibrium effect of a terror attack on the government's reelection probability, as implied by the representative citizen's behavior. In the remainder, we can therefore focus on the interaction between government and the community.

Substituting $q_i = E(v|T = i)$ in (1) and rearranging gives the government's objective function

$$u_G(s,i) = U_g(0) + q_0 R - p(s,i)[\Delta_g + QR] - c_g(s) \tag{3}$$

Maximizing this with respect to s implies that the government's optimal action is the solution to the following first order condition:

$$-\frac{\partial p(s,i)}{\partial s} \cdot [\Delta_g + QR] - \frac{\partial c_g(s)}{\partial s} = 0 \tag{4}$$

The objective function of the government is strictly concave in s, as the second derivative is $-\frac{\partial^2 p(s,i)}{\partial s^2}[\Delta_g + QR] - \frac{\partial^2 c_g(s)}{\partial s^2} < 0$. Thus, there is a unique optimal level of s for any given level of i, and, as a consequence, the government has a well-defined optimal response function. Moreover, as (4) is continuous in i, the government's best response function is continuous and we can

[14] Alternatively, the simultaneous model can be interpreted as a shortcut for a full dynamic model in which behavior of the community depends on the government's behavior in the previous period. In such a setup, the government has some incentive to disregard the negative consequences that increasing s has on future cooperation by the community, for example, because the government is primarily concerned with preventing a terror attack "on its watch" in the present period, rather than with the long run consequences that may materialize later (and under a different government).

apply the implicit function theorem to (4) to find its slope

$$\frac{ds}{di} = -\frac{-\frac{\partial^2 p(s,i)}{\partial s \partial i}[\Delta_g + QR]}{-\frac{\partial^2 p(s,i)}{\partial s^2}[\Delta_g + QR] - \frac{\partial^2 c_g(s)}{\partial s^2}}. \tag{5}$$

Since the denominator is negative and both terms in square brackets are positive, the sign of ds/di is the opposite of the sign of $\frac{\partial^2 p(s,i)}{\partial s \partial i}$. If government's and the community's activities are substitutes in preventing terror attacks, the optimal level of s decreases in i, and if they are complements, the optimal level of s increases in i.

The community chooses the level of i that maximizes its expected utility given in (2) and, as a result, its optimal action is the solution to the first order condition

$$-\frac{\partial p(s,i)}{\partial i}\Delta_c(s) - \frac{\partial c_c(i)}{\partial i} = 0. \tag{6}$$

The community's objective function is strictly concave in i, as the second derivative with respect to i is $-\frac{\partial^2 p(s,i)}{\partial i^2}\Delta_c(s) - \frac{\partial^2 c_c(i)}{\partial i^2} < 0$. By the same arguments as above, the community's best response function is continuous, and we can apply the implicit function theorem to (6) to find its slope

$$\frac{di}{ds} = -\frac{-\frac{\partial^2 p(s,i)}{\partial i \partial s}\Delta_c(s) - \frac{\partial p(s,i)}{\partial i}\frac{\partial \Delta_c(s)}{\partial s}}{-\frac{\partial^2 p(s,i)}{\partial i^2}\Delta_c(s) - \frac{\partial^2 c_c(i)}{\partial i^2}}. \tag{7}$$

The second term in the numerator is negative. A sufficient (but not necessary) condition for $\frac{di}{ds} < 0$ is $\frac{\partial^2 p(s,i)}{\partial i \partial s} > 0$, i.e., the government's and the community's actions are substitutes. If instead i and s are complements, the sign of $\frac{di}{ds}$ depends on the size of the countervailing effects.

The best response functions are continuous and the strategy spaces are bounded, which imply the following

Proposition 1. *The simultaneous game has a Nash equilibrium in pure strategies.*

We are interested in how an increased electoral incentive to provide more security (a higher Q) affects the equilibrium probability of a terrorist attack. To analyze this question, we focus on a setting where the pure strategy Nash equilibrium is stable. Loosely speaking, stability requires that, if we start with a pair of strategies (s_0, i_0) that are sufficiently close to, but different from a Nash equilibrium (s^*, i^*), a sequence of best responses converges towards the equilibrium. Formally, the definition is the following

Definition 1. *For given* (s_0, i_0)*, define the sequence* $\{(s_t, i_t)\}_{t=1,\ldots,\infty}$ *recursively as follows: Let* $s_t = s(i_{t-1})$ *and* $i_t = i(s_t)$*. The Nash equilibrium* (s^*, i^*) *is locally stable if there exists* $\varepsilon > 0$ *such that, whenever* $||(s_0, i_0) - (s^*, i^*)|| < \varepsilon$*, then* $\lim_{t\to\infty}\{(s_t, i_t)\} = (s^*, i^*)$.

While stability is not a property of the equilibrium implied by our assumptions, it is a natural feature of the equilibrium. For example, if i and s are substitutes, the equilibrium is stable if the government's optimal activity level does not change too drastically with the community's activity level of cooperation. More precisely, both best response functions are downward-sloping in this case of substitutes. A Nash equilibrium is locally stable if the best response function $s(\cdot)$ is steeper than the best response function $i(\cdot)$ at the equilibrium.[15] Figure 1 shows the convergence to the equilibrium starting from an initial point (s_0, i_0).

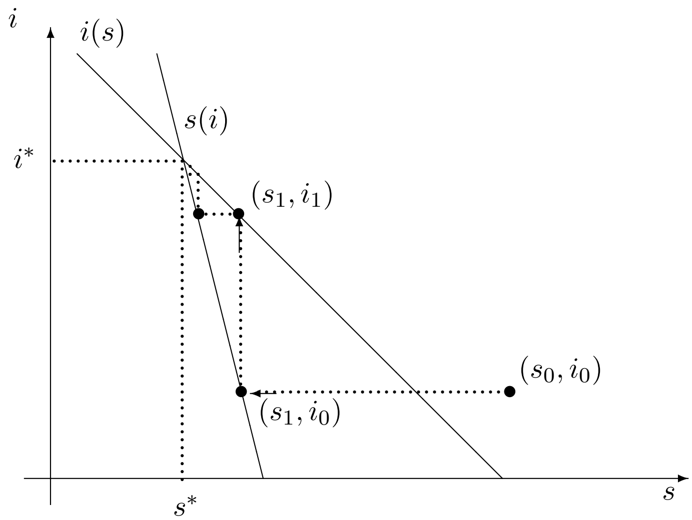


Figure 1: A stable equilibrium if i and s are substitutes

To analyze how the equilibrium probability of a terrorist attack $p(i^*(Q), s^*(Q))$ changes with changes in Q, we first analyze how the equilibrium actions $i^*(Q)$ and $s^*(Q)$ change in response to increased electoral incentives Q to prevent a terror attack. Figure 2 shows the two best response functions $i(s)$ and $s(i)$ for the case that i and s are substitutes in preventing a terrorist attack (both best response functions are downward-sloping in this case).

Because (3) is concave, a sufficient condition for a parameter change to increase the government's optimal s (for any level of i) is that the parameter change increases the left-hand side of (4). From this argument it follows that an increase of Q shifts the government's best response function to the right. In other words, given any fixed level of i, the government now prefers to choose a higher level of s (function $\hat{s}(i)$ in Figure 2).[16] As a consequence, the equilibrium changes from (s^*, i^*) to $(\hat{s}^*, \hat{i}^*)$; and while the equilibrium value of s increases, the equilibrium value of i decreases (because

[15] One can also easily check that, if i and s are substitutes and $i(\cdot)$ is steeper than $s(\cdot)$, then the equilibrium is unstable. Furthermore, if $\frac{\partial i(s)}{\partial s} < 0$ and $\frac{\partial s(i)}{\partial i} > 0$, then the equilibrium is stable, and if both $\frac{\partial i(s)}{\partial s} > 0$ and $\frac{\partial s(i)}{\partial i} > 0$, then $s(\cdot)$ has to be steeper than $i(\cdot)$ for the equilibrium to be stable.

[16] The same logic applies to a decrease in the government's marginal cost function $\frac{\partial c_g(s)}{\partial s}$ or an increase in R, the government's payoff from being in office.

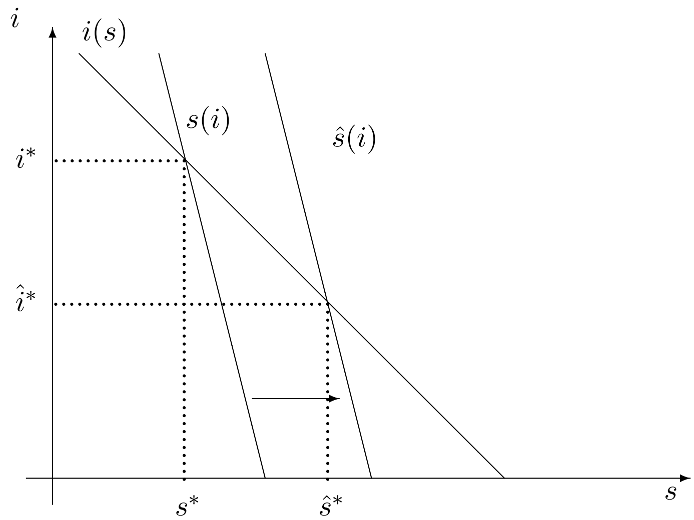


Figure 2: best response functions and equilibrium if i and s are substitutes

s and i are substitutes), and, as a result, an increase in Q can increase the equilibrium probability of a terrorist attack.[17]

Figures 3(a) and 3(b) show the comparative static effects for the case when s and i are complements ($\frac{\partial^2 p}{\partial s \partial i} < 0$). In this case, the shift of the government's best response function to the right (the government prefers a higher level of s) is independent of whether $\frac{\partial^2 p}{\partial s \partial i}$ is positive or negative. Thus if s and i are complements, the best response function of the government is always upward-sloping, while the slope of the community's best response function is negative if

$$\frac{\frac{\partial^2 p(s,i)}{\partial s \partial i}}{\frac{\partial p(s,i)}{\partial i}} > -\frac{\frac{\partial \Delta_c(s)}{\partial s}}{\Delta_c(s)} \tag{8}$$

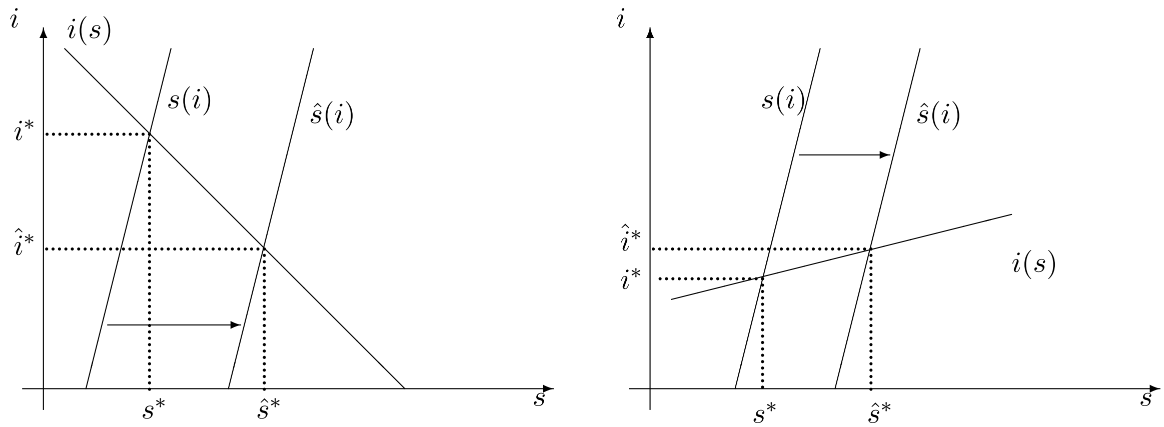
and positive otherwise. If condition (8) holds, an increase in Q can produce an increase in the equilibrium probability of a terrorist attack.

The next proposition summarizes the comparative static effect of a small change in the electoral incentives Q on the government 's and the community's equilibrium actions and, therefore, on the equilibrium level of security $p(i^*(Q), s^*(Q))$.

Proposition 2. *Assume that the equilibrium is locally stable and suppose that the electorate's responsiveness to terrorist attacks increases (i.e., Q increases).*

1. *If $\frac{\partial^2 p}{\partial s \partial i} > 0$ (i.e., if i and s are substitutes), then the equilibrium level of s increases and the equilibrium value of i decreases. The overall effect on the equilibrium probability of a terror attack is ambiguous.*

[17] In a parametric example in Section 6, we provide conditions under which this probability increases or decreases.



(a) $i'(s) < 0$ (b) $i'(s) > 0$

Figure 3: best response functions and equilibrium if i and s are complements

2. *If* $\frac{\partial^2 p}{\partial s \partial i} < 0$ *(i.e., if* i *and* s *are complements) and condition* (8) *holds, then the equilibrium level of* s *increases and the equilibrium value of* i *decreases. The overall effect on the equilibrium probability of a terror attack is ambiguous.*

3. *If* $\frac{\partial^2 p}{\partial s \partial i} < 0$ *(i.e., if* i *and* s *are complements) and condition* (8) *does not hold, then the equilibrium levels of* i *and* s *increase, and the probability of a terror attack decreases.*

Proof. See text above. □

Proposition 2 shows that increased electoral incentives for the government always increase the equilibrium level of s, even if we take into account the community's reaction of the community. However, the security-enhancing aspect of a higher equilibrium level of s is counteracted by a reduction in the equilibrium level of i if the community's best response function is downward sloping. The overall effect on the equilibrium level of security depends on which one of these effects is more important. Only if the optimal level of community's (terror prevention) activities increases even when the government chooses a higher level of s, will the direct effect on the government's incentives and the strategic effect on the community's action go in the same direction to reduce the equilibrium probability of a terror attack.

5.2 Commitment by the Government

The previous analysis shows that a higher level of governmental anti-terrorism activity possibly has the consequence of alienating the community, and thus increased electoral incentives to provide more security can have the perverse effect of increasing the equilibrium probability of a terrorist attack. In this section, we analyze the effect of increased electoral incentives on the equilibrium security level when the government can constrain itself by committing ex-ante to a particular value of s. The simplest way of formally modeling such commitment is to analyze a game in which the government moves first. Then, the community perfectly observes s before choosing its action i.

In this case, the equilibrium level of i is weakly greater in the sequential game than in the simultaneous game. We have the following:

Proposition 3. *The community's equilibrium action is (weakly) greater in the sequential than in the simultaneous game.*

Proof. See Appendix. □

The intuition for this result is as follows. In the simultaneous game, the government chooses its optimal action such that the direct benefits and costs of the marginal unit of anti-terrorism activities s just balance each other. In the sequential game, the government also takes into account how its level of anti-terrorism activities affects the community's action. How does this additional consideration affect the government's optimal choice?

In the sequential game, the government could choose exactly the same action as in the simultaneous game, (s^*, i^*). By the definition of a Nash equilibrium, the equilibrium actions in the simultaneous game are optimal responses to each other. If the government were to choose s^* in the sequential game, the community's optimal response would be i^*. If, instead, the government changes its action from s^* to some other level, this will affect the community's optimal action. Suppose that (8) holds so that the community's best response function $i(s)$ is decreasing in the level of governmental anti-terrorist activities s. In this case, if the government chooses $s < s^*$, the community chooses $i(s) > i^*$. The direct effect of s on the government's objective function is a second-order effect in the neighborhood of s^* (since s^* satisfies (4)), while the increase in i leads to a first-order increase in the government's objective function. Therefore, the reduction of s and the corresponding increase in i lead to a higher government utility. Similarly, suppose that (8) is violated so that the community's best response function $i(s)$ increases in the level of governmental anti-terrorist activities s. In this case, if the government chooses $s > s^*$, the community chooses $i(s) > i^*$.[18] Thus, in all cases, the government benefits by changing its action in the sequential game (relative to its action in the simultaneous game) to induce the community to choose a (at least weakly) higher level of activities to reduce terrorism.

The above paragraph develops the intuition why the government has a *marginal* deviation from s^* to increase its utility while the community's level of terror-reducing activity increases. However, strictly speaking, it does not show that the globally optimal action for the government induces more

[18] In the knife-edge case that $\frac{\partial i(s^*)}{\partial s} = 0$, the government cannot influence i at the margin, and it is optimal for the government to choose the same level of s^* as in the simultaneous game.

cooperation than in the simultaneous game. This is the reason for why the proof of Proposition 3 in the Appendix uses a different argument that does not rely on differentiability to show that the claimed result obtains globally.

Given Proposition 3, an increase in the government's electoral incentives Q to provide more security translates into a reduced equilibrium probability of a terror attack. We have the following:

Proposition 4. *An increase in the government's electoral incentives to provide more security (weakly) decreases the equilibrium probability of a terrorist attack.*

Proof. See Appendix. □

The proof of Proposition 4 relies on a "revealed preference" argument for the government. Consider a case where electoral incentives for terror prevention increase from Q^1 to Q^2, but suppose, to the contrary of the proposition, that the equilibrium probability of a terror attack were to increase (i.e., $p^2 > p^1$). Situations 1 and 2 differ only in what the government's objective function is, but not in what the government can implement; thus, p^1 and p^2 are available in both situations. If the government indeed prefers to implement the larger p^2 rather than p^1 when $Q = Q^2$, it should even stronger prefer p^2 to p^1 when $Q = Q^1$ because the government's cost of a terror attack is lower in that scenario. The formal details of this argument are in the Appendix.

5.3 Commitment, First Move and Observability

The previous subsection shows that if the government can commit to a level of anti-terrorism activities, an increase in the government's incentives to foil a terrorist attack leads to a lower equilibrium probability of an attack.[19] However, we have assumed that the community can *perfectly and without cost* observe the exact level of anti-terrorist activity chosen by the government. In the context of terrorism prevention, this assumption is unrealistic because many anti-terrorism actions require secrecy to be effective at all. It is important to analyze what would happen in a sequential game in which the government moves first when we relax the assumption of perfect observability and instead assume realistically that the community receives a signal that is correlated (but not perfectly so) with the government's level of anti-terrorism activities. The logic of our argument follows **?**).

Specifically, suppose that for any action s the government chooses, the community observes the realization x of a random variable X which stochastically depends on the action s. We assume that the conditional probability density function $j(x|s)$ satisfies $j(x|s) > 0$ for all $x \in X$ and $s \in [0, \bar{s}]$. For example, suppose that $X = s + \varepsilon$, so that the signal x is equal to the true value s plus an

[19]The sequential game also gives a payoff to the government that is at least as large as its payoff in the game where community and government move simultaneously.

"observation error" ε that could be distributed according to a normal distribution $N(0, \sigma^2)$. Note that we do not impose any restriction on the noise, in fact it could be that the community receives a very high quality signal.

Denote by $\mu(x, y)$ the community's posterior belief that the government's action s is no larger than y, conditional on observing the signal x. Since every value of x arises on the equilibrium path, all beliefs are pinned down by Bayes' rule. A pure strategy of the community in this framework is a function $i_{seq}(\cdot)$ that maps signals x into actions. We have the following:

Proposition 5. *A pair of strategies $(s^*, i_{seq}(\cdot))$ is a pure strategy perfect Bayesian equilibrium of the sequential game with imperfect observability if and only if $i_{seq}(x) = i^*$ for all x, and (s^*, i^*) is a pure strategy equilibrium of the simultaneous game.*

Proof. See Appendix. □

Proposition 5 shows that the only pure strategy Nash equilibria in the game with imperfect observability are the ones of the simultaneous game. Intuitively, in any pure strategy equilibrium, the community correctly anticipates the government's equilibrium action, and therefore its own equilibrium action is independent of the signal observed. But, then, if the government anticipates that the community's equilibrium action is independent of the signal the community observes it chooses its best response for the given community's equilibrium action. Thus, only actions s^* and i^* that are best replies to each other are can arise on the equilibrium path of the sequential game with imperfect observability.

A similar argument for the equivalence of the simultaneous and the sequential game can be made by assuming that the government's action is not imperfectly observable, but rather that the community has to choose whether to pay a (possibly arbitrarily small) cost ϵ to observe the government's level of anti-terrorism activities. In this case, the only pure strategy equilibria are the ones of the simultaneous game as well. To see this, note that in a pure strategy equilibrium, the community has no incentive to pay the observation cost, and thus will choose an action that is independent of the actual action of the government. But then, the government will choose its optimal response against the expected action of the community, and therefore the only equilibrium actions are those that are equilibrium actions in the simultaneous version of the game.

In summary, these results show that the government cannot commit to an ex-post suboptimal level of ant-terrorism activity s, if the community does not observe perfectly and costlessly the level of anti-terrorism activities. More importantly, the results suggest that commitment in the context of government anti-terrorism activity requires some explicit institutional constraints on the government actions. We will discuss several possible commitment mechanisms in Section 7.

6 A parametric example

In this section, we provide a parametric example to provide precise conditions (within the framework of the example) under which the probability of a terror attack decreases or increases with increased electoral incentives and also to exemplify the importance of commitment.

We assume that $p(s,i) = \alpha e^{-s} + (1-\alpha)e^{-i}$.[20] The cost functions are linear in s and i, that is $c_g(s) = k_g s$ and $c_c(i) = k_c i$, respectively. The community's utility when a terror attack occurs is $U_c(1,s) = \bar{u}/(1+s)$, and its utility when no terror attack occurs is $U_c(0,s) = (\bar{u}+\delta)/(1+s)$. Note that a higher level of anti-terrorism governmental actions s reduces the community's utility in both states and also that the utility difference: $\delta/(1+s) = U_c(1,s) - U_c(0,s)$, is decreasing in s as well.

6.1 Simultaneous Interaction

We first analyze the effect of increased electoral incentives in the setting in which the government and community move simultaneously. The government's maximization problem is

$$\max_s [1 - \alpha e^{-s} - (1-\alpha)e^{-i}](\Delta_g + QR) - k_g s. \tag{9}$$

Solving the first order condition of the government's maximization problem yields

$$s = \ln\left(\frac{\alpha(\Delta_g + QR)}{k_g}\right) \tag{10}$$

as the government's optimal action (provided that this solution is positive otherwise $s^* = 0$). Note that this level of s is independent of the level of i chosen by the community.

The community maximization problem is

$$\max_i [1 - \alpha e^{-s} - (1-\alpha)e^{-i}]\frac{\delta}{1+s} - k_c i. \tag{11}$$

Solving the first order condition of the community's maximization problem yields

$$i(s) = \ln\left(\frac{(1-\alpha)\delta}{k_c(1+s)}\right) \tag{12}$$

as the community's best response function. Thus the equilibrium level of i is

$$i^* = \ln\left(\frac{(1-\alpha)\delta}{k_c}\right) + \ln\left(\ln\left(\frac{k_g}{\alpha(\Delta_g + QR)}\right)\right), \tag{13}$$

[20] This specification can be interpreted as one in which government and community actions each affect different "areas", in which the probability of an attack cannot be affected by the other player.

provided that this is positive (otherwise $i^* = 0$).

We focus our comparative statics exercise on an interior equilibrium in which $s^* > 0$ and $i^* > 0$. Substituting the equilibrium values into $p(\cdot)$, the probability of a successful terror attack is

$$p(s^*, i^*) = \frac{k_g}{\Delta_g + QR} + \frac{k_c}{\delta}\left(1 + \ln\left(\frac{\alpha}{k_g}\right) + \ln\left(\Delta_g + QR\right)\right). \tag{14}$$

in equilibrium. Differentiating with respect to the probability of reelection Q yields

$$\frac{\partial p(s^*, i^*)}{\partial Q} = -\frac{k_g R}{(\Delta_g + QR)^2} + \frac{k_c}{\delta}\frac{R}{(\Delta_g + QR)}. \tag{15}$$

This is positive if and only if

$$\frac{\Delta_g + QR}{\delta} > \frac{k_g}{k_c}. \tag{16}$$

Thus, if the ratio of the "valuations" the government and the community get from preventing a terror attack, respectively, is already larger than the ratio of the cost parameters, then a further increase in the government's electoral incentives Q to prevent a terrorist attack actually *increases* the equilibrium probability of a terrorist attack.

Note that (16) is independent of α. This may seem surprising because it is intuitive to think that the "perverse" effect of electoral incentives on the equilibrium level of security is more (less) likely to obtain if the importance of the community's actions to reduce terrorism is large (small). The result that (16) is independent of α only holds in an interior equilibrium. For example, if $\alpha \to 1$, i.e. only the government's actions matter for effective terror prevention and $i^* = 0$ because the right-hand side of (13) is negative. In this case, an increase Q has only the direct effect of increasing s, while the strategic effect on i is zero. Thus, for α close to 1, stronger electoral incentives to provide security lower the equilibrium probability of an attack. In this sense, the "perverse" comparative static effect requires that the effect of the community's actions on terror reduction is sufficiently strong. But once this importance reaches a certain threshold (so that the equilibrium is interior), the direction of the electoral incentive Q is independent of α.

6.2 Sequential Interaction

Next, we analyze the sequential interaction. If the government can commit to a level of s which is perfectly and costlessly observable by the community, then the community's optimal action is given by (12). Note that $i'(s) = -1/s < 0$. Then the government's optimization problem is

$$\max_s \left[1 - \alpha e^{-s} - (1-\alpha)e^{-i(s)}\right]\left[\Delta_g + QR\right] - k_g s. \tag{17}$$

Differentiating with respect to s gives

$$\left[\alpha e^{-s} + (1-\alpha)e^{-i(s)} i'(s)\right]\left[\Delta_g + QR\right] - k_g = 0. \tag{18}$$

Substituting for $i(s)$ and $i'(s)$ yields

$$s = \ln\left(\frac{\alpha}{\frac{k_c}{\Delta_c} + \frac{k_g}{\left[\Delta_g + QR\right]}}\right) \tag{19}$$

and substituting this value into the minority group's best response function yields

$$i = \ln\left(\frac{(1-\alpha)\Delta_c}{k_c}\right) - \ln\left(\ln\left(\frac{\alpha}{\frac{k_c}{\Delta_c} + \frac{k_g}{\left[\Delta_g + QR\right]}}\right)\right) \tag{20}$$

along the equilibrium path. Comparing (19) with (10) we can note that the government's optimal level of s is lower in the sequential game. As a result, the equilibrium value of i is higher in the sequential game (using $i'(s) < 0$).

Substituting in the above values of $i*$ and $s*$ into the probability of a terrorist attack function p, we obtain the following equilibrium probability of a successful terror attack

$$p_{seq} = \frac{k_g}{\left[\Delta_g + QR\right]} + \frac{k_c}{\Delta_c} \ln\left(\frac{\alpha e}{\frac{k_g}{\left[\Delta_g + QR\right]} + \frac{k_c}{\Delta_c}}\right). \tag{21}$$

To see how the equilibrium probability of a terror attack changes with changes in increased electoral incentives, we differentiating p_{seq} with respect to Q which gives us

$$\frac{\partial p_{seq}}{\partial Q} = -\frac{k_g R}{\left[\Delta_g + QR\right]^2} \frac{\frac{k_g}{\left[\Delta_g + QR\right]}}{\frac{k_g}{\left[\Delta_g + QR\right]} + \frac{k_c}{\Delta_c}} < 0. \tag{22}$$

Thus, in contrast to the simultaneous game, in the sequential game an increase in the electoral incentives of the government to prevent a terror attack always translates into a reduced equilibrium probability of a terror attack.

7 Discussion and Policy Implications

The analysis suggests that increased electoral demands to provide more security leads to a lower equilibrium probability of terrorist attack if the government can commit to a level of anti-terrorist activities. However, Proposition 5 shows that under reasonable assumptions about the observability of its anti-terrorism activities, the government cannot achieve commitment by simply "moving first". Achieving commitment thus requires explicit mechanisms that constrain either the government's anti-terrorism actions or the government's preferences. We discuss three plausible mechanisms of achieving commitment: checks and balances on the government's actions, strategic delegation by voters to politicians with different preferences and term limits.

Checks and Balances on the Government's Actions. Checks and balances on emergency legislation and the government anti-terrorism actions are a possible mechanism to keep the government committed to less aggressive anti-terrorism efforts. The typical argument against checks and balances is that they impose costs on government actions and thus restrict the government's discretion and flexibility of action in times of necessity. However, our analysis suggests that some constraints on government actions improve security even if security is the citizens' concern. In contrast, passing emergency legislation that gives the government more powers or relaxing exiting laws to give the government more flexibility can produce less security.

In most liberal societies, the judiciary can serve as a check and balancing commitment device. The judiciary can work as a commitment device through two specific mechanisms: by enforcing legal limits on anti-terrorism actions and by increasing the costs of anti-terrorism actions. First, courts equipped with the power of judicial review can enforce constitutional commitments to rights and invalidate emergency legislation that allows more aggressive governmental actions even if the legislation might work in preventing terrorism. This argument for judicial checks and balances as a commitment device does not require that the courts observe perfectly the government's anti-terrorism actions. If the court's signal is close to the true policy with a high enough probability, even an imperfect judiciary can deter excessive antiterrorism.

Second, judicial checks can also increase the government's costs, with the effect of de facto limiting the government's anti-terrorism efforts. For example, the Foreign Intelligence Surveillance Act (FISA) imposes some judicial checks on government surveillance powers. FISA prescribes procedures for the physical and electronic surveillance and collection of "foreign intelligence information" between "foreign powers" and "agents of foreign powers" (which may include American citizens and permanent residents suspected of being engaged in espionage and violating U.S. law on territory under United States control). More importantly, the act limits requires that the government agents obtain a surveillance warrant by showing probable cause in a special court. Thus, the act increases the government's cost of engaging in surveillance and likely leads to a reduction of surveillance activity in comparison to the situation in which the government is completely unconstrained. Indeed, FISA has been strongly criticized because it constrains the government antiterrorism efforts but our analysis suggests that it can improve security.

However, judicial checks work as an effective commitment device only if the courts enforce the nation's laws and constitution even in times of crisis. A common observation is that "in times of war, the law falls silent" ("inter arma enim silent leges"). In other words, courts may not necessarily enforce legal violations by executive officials in times of emergency. Because government officials have no legal costs for breaking the laws, they can act unconstrained in their antiterrorism efforts but we suggests that this can lead to less security. The commitment opportunity afforded by judicial review disappears if there is a culture of impunity, in particular for transgressions committed "in good faith". In other words, at the minimum, it is necessary that public officials who are considering breaking the laws (even in good faith) face some probability of being punished for their behavior in a court of law for the judiciary to be an effective commitment device.

For example, suppose there is a law that prohibits certain ant-terrorism activities. If legal sanctions are not enforced ex-post, government officials always have an incentive to increase its level of anti-terrorist measures over the extent that the law allows for, and all these transgressions could be in "good faith" (i.e., undertaken with the sole objective of lowering the probability of a terrorist attack) because electoral demands to provide more security. However, if all officials who break the law can expect to be pardoned (by the president for example) because of their impeccable motivations, then the law effectively does not afford commitment to the government. We believe that this is an important and, to our knowledge, novel argument that applies, for example, to the question whether government officials should be prosecuted for ordering torture of suspected or actual terrorists, even if it were true that torture sometimes "works" in obtaining information that can be used to foil terrorist attacks.

There is also an empirical literature on the relationship between incidents of terrorism and government commitment to respecting for human rights (**?**; **?**; **?**). Some of these works suggest that if the government does not observe human right commitments and, for example, infringes on physical safety rights, such infringements are correlated with more terrorism acts (**?**). Assuming that there is indeed a causal relation between infringement of physical integrity and terrorism incidents, this relationship raises the question of why a rational government does not anticipate the detrimental effects of abusing physical safety rights and adjust its behavior accordingly. Our analysis provides an answer to this puzzle. If the citizens cares more about terrorism prevention, it is optimal for the government to resort to more aggressive means which although by themselves reduce terrorism they also have the undesired effect of alienating the community in which terrorists have their roots and, as a result, the overall equilibrium outcome may be less security.

Term limits. Term limits is another mechanism to achieve commitment. By definition, a government that faces a term limit has no incentive to adjust its policy in order to increase the likelihood to gain reelection. In most settings, this is an argument *against* term limits, as a government with a term limit has a lower incentive to work for the common good than one that can be reelected. However, our analysis suggests that stronger electoral incentives to achieve the common good may actually have the perverse effect of making the achievement of the common good less likely in equilibrium. In our setting term limits are a welfare-improving institution.

Strategic delegation. Finally, another mechanism to achieve commitment is for voters to strategically select the government's preference, and, as a result, to possible choose a government with different preference than themselves.[21] We discuss two possible implementations of this idea in our framework.

First, public officials vary in their preference for reelection. In fact, there is a long-lasting debate about what type of public official is the best representative of the citizens. In Federalist 57, James Madison argued that the best representative is one who strives to achieve the common good but nonetheless is also responsive electoral concerns.[22] In contrast, Edmund Burke argued that the best representative is one who cares exclusively about achieving the common good and has no preference for reelection. If we think of different politicians' preferences as continuum from those Burkean trustees to the "Madisonian" representatives, then our analysis suggests that citizens are better off by selecting a government more on the Burkean end of the spectrum because.

Second, we can think of the government's cost function for anti-terrorism activities as at least partially reflecting the preferences and attitudes of the policy maker. For example, different presidents are likely to have different preference for protecting civil liberties and minority rights, and, therefore, would be inclined to implement different anti-terror policies. Our analysis suggests that the citizens should optimally select a politician who is more concerned about civil liberties and minority rights than themselves to implement the anti-terror policy.

[21] There are several models in political economy that explore the idea of strategic delegation to decision makers whose preferences differ from those of the pivotal voter. See, for example, Rogoff (1985), Messner and Polborn (2004), Dal Bo (2006) or Klumpp (2007).

[22] Andrew Rehfeld (2009) argues this is precisely the kind of representation that James Madison was defending in his contributions to The Federalist.

8 Conclusions

In this paper, we have argued that increased electoral demands for providing more security can in fact lead to less security if there are not explicit mechanisms to constrain the government antiterrorism efforts. Institutional check and balances can improve the level of security even if they prohibit some antiterrorism options and tie the hands of the government in its anti-terrorism efforts. The analysis thus provides a different view on the relationship between allowing the government more discretion and flexibility of action in times of emergencies and improving security.

Appendix

Proof of Proposition 3. Let (s^*, i^*) denote the equilibrium strategies in the simultaneous game, let $(s_{seq}, i_{seq}(s))$ denote the equilibrium strategies in the sequential game, and let $i_{seq} \equiv i_{seq}(s_{seq})$ denote the community's action along the equilibrium path of the sequential game. Remember that the government's objective function in (3) is denoted by $u_G(s, i)$.

Since (s^*, i^*) is an equilibrium in the simultaneous game, it must be true that

$$u_G(s^*, i^*) \geq u_G(s_{seq}, i^*). \tag{23}$$

Furthermore, in the sequential game, the government's equilibrium utility must be at least as large as its utility in the simultaneous game, because $i_{seq}(s^*) = i^*$, and hence the government could at least obtain the same utility as in the simultaneous game by choosing s^* in the sequential game. Thus,

$$u_G(s_{seq}, i_{seq}) \geq u_G(s^*, i^*). \tag{24}$$

Equations (23) and (24) together imply that

$$u_G(s_{seq}, i_{seq}) \geq u_G(s_{seq}, i^*). \tag{25}$$

However, u_G is strictly decreasing in i. Thus, if, contrary to the proposition, $i_{seq} < i^*$, (25) cannot hold. □

Proof of Proposition 4. The government maximizes

$$U_g(0) + q_0 R - p(s, i(s))[\Delta_g + QR] - c_g(s), \tag{26}$$

where $i(\cdot)$ is the community's best response function. Suppose that $Q^1 < Q^2$, i.e., the electoral incentives are stronger in case 2 than in case 1. Denote the solution of the government's problem in case k by s^k, and denote the corresponding equilibrium probability by p^k; for example, $p^1 = p(s^1, i(s^1))$. Optimality in case 1 requires that

$$-p^1 \left[\Delta_g + Q^1 R\right] - c_g(s^1) \geq -p^2 \left[\Delta_g + Q^1 R\right] - c_g(s^2), \tag{27}$$

as s^2 is a feasible choice and cannot get the government a higher payoff than the optimal action s^1. Analogously, optimality in case 2 requires that

$$-p^2 \left[\Delta_g + Q^2 R\right] - c_g(s^2) \geq -p^1 \left[\Delta_g + Q^2 R\right] - c_g(s^1). \tag{28}$$

Adding (27) and (28) and rearranging yields

$$R(p^2 - p^1)(Q^1 - Q^2) \geq 0. \tag{29}$$

By assumption, $Q^1 - Q^2 < 0$, so that it must be true that $p^1 \geq p^2$, as claimed. □

Proof of Proposition 5. Consider first the if-part of the proposition. Observe that, if the government plays pure strategy s^* in equilibrium, the community's belief must place probability 1 to the event that the government chooses action s^*, no matter what signal x the minority community observes (as any observed signal is consistent with the government having chosen s^*). Given this belief, action i^* maximizes the community's expected utility (by the fact that i^* is an optimal response to s^* in the simultaneous game). Finally, given that the community chooses i^* independent of the signal received, the government's optimal action is s^*. This proves that $(s^*, i_{seq}(x) = i^*$ for all $x)$ is a pure strategy perfect Bayesian equilibrium of the sequential game with imperfect observability.

Consider now the only-if-part of the proposition. Assume, by way of contradiction, that $s = s'$ in a perfect Bayesian equilibrium, where s' is not part of any pure strategy equilibrium of the simultaneous game. Since we have a pure strategy equilibrium, the community's belief must place probability 1 on s', and thus $i_{seq}(x) = i(s')$ for all x (where $i(\cdot)$ is the optimal response function from the static game). However, since the community's action $i(s')$ is independent of the signal, it must be the case that s' maximizes the government's utility, given that the community plays $i(s')$, i.e. $s' = s(i(s'))$. But this contradicts the assumption that $(s', i(s'))$ is not an equilibrium of the simultaneous game. □