5-1988

To Bargain or Not To Bargain: That Is The Question

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Disciplines
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Author(s): Harvey E. Lapan and Todd Sandler
Published by: American Economic Association
Stable URL: http://www.jstor.org/stable/1818090
Accessed: 14-09-2016 14:45 UTC

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THE POLITICAL ECONOMY OF TERRORISM

To Bargain or Not To Bargain: That Is The Question

By HARVEY E. LAPAN AND TODD SANDLER*

In November 1986, news media revelations disclosed that the Reagan Administration had deviated significantly from its stated policy of never negotiating with terrorists when it traded arms to obtain the freedom of three Americans—Rev. Benjamin Weir in September 1985, Rev. Lawrence Jenco in July 1986, and David Jacobsen in November 1986. On January 26, 1987, terrorists, posing as policemen, kidnapped an Indian and three American professors at the American University of Beirut, thereby replacing the three Americans previously bartered away. Accepted wisdom, heard almost daily in newscasts, maintains that one should never bargain with terrorists since such negotiations encourage more hostage taking by making it a profitable activity; recent events in Beirut seem to support conventional views.

Yet even the staunchest supporter of the no-negotiation strategy of precommitment, the Israelis, has made noteworthy exceptions in the case of the school children taken hostage at Maalot in May 1974, and during the hijacking of TWA Flight 847 in June 1985. Another exception involved the Israelis’ release of 1,150 Arab prisoners, including Kozo Okomato, in a negotiated swap for three Israeli soldiers in May 1985 (The Economist, 1987, p. 29). Okomato, a Japanese Red Army Faction member, was the sole surviving terrorist in the Lod Airport massacre of 1972, which left 27 people dead and 78 injured.

We use economic analysis in a simple game-theory framework to ascertain under what circumstances a government would want to precommit itself to a no-negotiation strategy. From the government viewpoint, we examine both the choice of deterrence expenditure (i.e., expense meant to reduce terrorist logistical success during incidents) and whether to negotiate or not.

Our analysis demonstrates that the beliefs and the resolve of the terrorists are crucial in identifying the rather restrictive scenarios in which a no-negotiation strategy is desirable in the case of a credible precommitment. When governmental declarations are not completely credible and uncertainty characterizes the government’s costs of not negotiating, then never negotiating is likely to be time inconsistent and not a plausible policy. In a multiperiod model, reputation effects may not be sufficient for a government to maintain a policy of never negotiating with hostage-taking terrorists owing to public choice considerations. Perhaps surprising, the conventional wisdom regarding the no-negotiation strategy does not withstand theoretical scrutiny except in a limited number of contrived cases.

I. Basic Structure of the Models

The analysis focuses on terrorist incidents that involve the taking of hostages (for example, skyjackings, kidnappings) for the purpose of gaining concessions (for example, ransoms, prisoners releases). There are two agents in the game—the terrorist group and the government; hostages are treated as exogenous participants. Initially, we present

†Discussants: Mancur Olson, University of Maryland; John Tschirhart, University of Wyoming; Benjamin Zycher, Rand Corporation.

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1 Descriptions and details of transnational terrorist events between 1968 and 1979 are drawn from Edward Mickolus (1980).

2 On terrorist rationality, see Scott Atkinson, Sandler, and John Tschirhart (1987).
Government Chooses Deterrence Expenditure ($D_t$)

Given Their Beliefs, Terrorists Decide Whether to Attack

0

$H(t)$

$(a + H(t)) / (h + H(t)) (n_t + H(t))$

Period $t + 1$

and Reputation Effects

FIGURE 1. GAME TREE—PERIOD $t$

the underlying structure for a multiperiod sequential game that degenerates readily to a single-period game. In each period, the government has two potential strategic variables: how much to expend to deter an attack, and whether to negotiate or not in the event of a terrorist logistical success, whereby the terrorists manage to secure one or more hostages. The terrorists need to decide whether to attack. In Figure 1, the extensive form for this sequential game is displayed, complete with payoffs. First, the government chooses its $t$th period expenditures, $D_t$, to deter an attack; second, the terrorists decide whether to attack; and third, the government determines whether to negotiate in the event of a terrorist logistical success. The optimal strategy for each agent depends on its payoff in each state and the beliefs that it holds as to the likelihood attached to each state. For any given state, the top number in the payoff vectors of Figure 1 denotes the terrorists’ net benefit or cost, while the bottom number depicts the government’s cost.

In period $t$, the terrorists receive 0 if they do not attack. In the event of an attack, three outcomes are possible: (i) the attack fails; (ii) the attack succeeds but the negotiation fails; and (iii) the attack and negotiation succeed. We assume that outcome $i$ imposes a net cost of $c$ on the terrorists, whereas outcomes $ii$ and $iii$ yield a net benefit of $l$ and $m$, respectively, to the terrorists. The net benefit for a logistical success that does not produce concessions may be positive or negative. For a media-attracting skyjacking, publicity for a terrorist cause might make $l$ positive even when concessions are zero. In the case of kidnappings, however, $l$ is more apt to be negative, since the capture and subsequent maintenance of a hostage in a secret location is usually an expensive operation. The expected payoff ($Z_t$) to the terrorists from an attack also depends upon the probability ($\theta_t$) that the terrorists attach to a logistical failure and the probability ($p_t$) that they attach to government capitulation. 3 Hence, from Figure 1, the terrorists’ expected payoff from an attack is equal to

\[
Z_t = (1-\theta_t)\left[p_tm + (1-p_t)l\right] - \theta_tc,
\]

where $m > l > -c$ and $m > 0$. The terrorists will attack whenever their expected payoff is positive; that is, whenever

\[
c < c^* \equiv \left[(1-\theta_t)/\theta_t\right] \times \left[p_tm + (1-p_t)l\right].
\]

From (2), the likelihood of an attack increases as either the probability of success ($1-\theta_t$) or the perceived likelihood of government capitulation ($p_t$) increases. Equation (2) indicates that even a credible policy

3The time subscripts are introduced to allow subsequent generalization to a multiperiod setting.
of precommitment never to negotiation, which in turn implies that \( p_t = 0 \), may be insufficient to deter an attack if the terrorists derive net benefits from logistical success \( (I > 0) \), from, say, publicity, even in the absence of concessions. The no-negotiation precommitment may also be insufficient to deter attacks when the cost associated with a logistical failure is low or negative.

In fact, terrorist groups that perceive benefits from logistical failure and logistical success ending in negotiation failure \( (I > -c > 0) \) will attack regardless of a credible precommitment strategy. The Hezbollah, a pro-Iranian Shiite Fundamentalist terrorist group operating out of the Bekaa Valley in Lebanon, places a high value on martyrdom and could be placed in this category of groups. Not only does martyrdom give the victim a high perceived benefit, it assists the group to recruit. In a U.S. Department of State (1986, p. 19) report, the Hezbollah was said to hold many of the hostages taken in recent years in Beirut. Furthermore, the Hezbollah has been connected to the suicide bombings of the U.S. Marine barracks in October 1983, the U.S. Embassy in Beirut in April 1983, and the U.S. Embassy in Kuwait in December 1983. For the Hezbollah, the conventional wisdom regarding negotiations would not hold, since net benefits are derived under any outcome. A credible precommitment policy would, however, deter attacks if the group was solely motivated by concessions.

Turning to the government behavior, we denote its expenditure on deterring (and foiling) terrorist attacks as \( D_t \). This expenditure will determine, along with nature, the terrorists' perceived probability of failure \( (\theta_t) \) and will be incurred in all states. Government costs depicted in Figure 1 indicate that if no attack occurs, the government incurs no additional costs, but if an attack occurs and fails, the government incurs an additional cost of \( a \ (\geq 0) \). If, however, an attack succeeds, the government must then decide whether to capitulate or not. The (current) cost of not capitulating is denoted by \( n_t \) and reflects the cost associated with hostage lives and resources expended. If the government does capitulate, it incurs a current cost \( h \), which may include perceived political cost and the cost associated with the consequences of freeing terrorists or augmenting terrorists' resources. Nevertheless, neither \( n_t \) nor \( h \) include reputational effects associated with negotiating at this juncture.

In a true multiperiod setting, the government must consider how its negotiating behavior will affect its reputation by influencing the terrorists' perceived \( p_t \), and hence the likelihood of an attack in the future. Moreover, a government must be concerned whether it can take current actions to alter terrorists' beliefs about the government's willingness to negotiate. One such posture that is often suggested is a precommitment policy never to negotiate, which we term credible provided that \( p_t = 0 \) for all future \( t \).

The government influences the terrorists' perceived failure rate through its expenditure on deterrence, in which

\[
\theta_t = K(D_t) \quad \text{or} \quad D_t = K^{-1}(\theta_t) = H(\theta_t),
\]

where \( H(0) = 0, \lim_{\theta_t \to 1} H(\theta_t) = \infty, \ H' > 0, \) and \( H'' > 0 \). We further assume that the government does not know the resolve or fanaticism of the terrorists so that \( c \geq 0 \) is a random variable with a probability density function of \( f(c) \). From the government's perspective, the probability of an attack is the likelihood\(^4\) that \( c < c^* \) (see (2)), that is

\[
\text{prob}\{ c < c^* \} = \Omega_t = \int_0^{c^*} f(c) \, dc.
\]

Since \( c^* \) in (4) depends on terrorists' beliefs concerning capitulation and logistical success, the likelihood of an attack clearly depends on these beliefs, (i.e., \( \Omega_t = F(\theta_t, p_t) \)). By reducing the likelihood of a logistical success, increased deterrence expenditure would lower the perceived probability of an attack. Furthermore, an increase in terrorists' belief regarding government capitula-

\(^4\)An alternative, but qualitatively similar, interpretation is to assume that there are many \( N \) terrorist groups with the distribution of their values given by \( f(c) \). Then \( \Omega_t \) represents the proportion of groups that attack; \( \Omega_t N \) is the number of such attacks.
tion encourages terrorist strikes. These results follow from partially differentiating (4) and the assumptions invoked thus far. Throughout, the two agents are assumed to have identical beliefs of the likelihood of attack.

II. Single-Period Model: No Reputational Effects

In the single-period model, the government ignores reputation effects and takes as given the terrorists' belief, \( p_t \), that the government will negotiate. If the negotiation decision is made ex post, the government would minimize its cost by negotiating if, and only if, capitulating is less costly (i.e., \( n_t > h \)). Hence, ex post cost in the event of a logistical success is \( \min(n_t, h) \). From an ex ante perspective, expected cost to the government is

(5) \[ E[T_{C_t}] = H(\theta_t) + \Omega_t a + \Omega_t (1 - \theta_t) E[\min(n_t, h)], \]

where \( n_t \) is a random variable with a density function \( g(n_t) \), and \( E[\cdot] \) is the expectations operator. The government determines its optimal level of deterrence by choosing \( \theta_t \), ex ante to minimize (5). If \( h \) lies inside the range of \( n_t \), then it is easy to show that \( E[\min(n_t, h)] < \min(E[n_t], h) \). This fact proves helpful when identifying costs associated with the precommitment strategy of never negotiating.

We denote \( \theta_t^* \) as the argmin \( E[T_{C_t}] \) and \( T_{C_t}^* \) as minimized expected cost. A simple comparative static analysis of the first-order conditions of (5) indicates that the optimal level of deterrence increases as (i) the likelihood of attack goes up, (ii) the expected cost of successful attacks rises, and (iii) the ability to deter attacks increases (i.e., \( \Omega_t = \partial \Omega_t / \partial \theta_t \) rises).\(^5\) Furthermore, since the likelihood of attack is an increasing function of \( p_t \), the optimal level of deterrence is also an increasing function of the government's beliefs of the terrorists' own beliefs concerning the government's willingness to capitulate. Finally, one might wonder where the terrorists' beliefs concerning capitulation are derived. If the terrorists know how the government behaves and if they further know the true distribution of the government cost from not capitulating, then consistency of expectations implies that \( p_t = \text{prob}[n_t > h] \).

We are now prepared to examine the desirability of precommitment never to negotiate when deterrence expenditure is also a choice variable. In this case, \( \Omega_t \) denotes the ex ante probability of an attack when precommitment is credible (\( \Omega_t = F(\theta_t, 0) \)). If the government adheres to its pledge, its expected costs are then

(6) \[ T_{C_t} = H(\theta_t) + \Omega_t a + \Omega_t (1 - \theta_t) E[n_t], \]

where \( E(n_t) \) indicates the expected cost of a successful attack, given that negotiations cannot occur. A comparison of (5) and (6) indicates that if a policy of precommitment eliminates all attacks (i.e., \( \Omega_t = 0 \) when evaluated at \( \theta_t^* \)), then precommitment dominates the ex post decision. When, however, precommitment does not eliminate all attacks, precommitment would imply higher ex post costs from inflexibility in those incidents where costs would be minimized by capitulating (i.e., \( E(n_t) > E[\min(n_t, h)] \)). Thus, precommitment, even when credible, may not be optimal. In addition, when \( \Omega_t > 0 \) and an attack occurs, the government may face a time consistency problem since holding firm to its policy may be more costly than capitulating. To compare the optimizing level of deterrence expense with and without precommitment, the first-order condition associated with (6) should be evaluated at the cost-minimizing deterrence level \( \theta_t^* \) for no precommitment. Such a comparison, while giving no definitive conclusions, implies that optimal deterrence expense under precommitment is apt to exceed that with no precommitment when either inflexibility costs are high or \( \Omega_t \) is near \( \Omega_t \) in value. In the latter case, precommitment does not significantly alter the likelihood of attack. Benefits from precommitment comes from its ability, if any, to change terrorists' beliefs,

\(^5\) A more technical version of this paper, available upon request, contains the comparative statics details.
and hence alter the probability of attack. Terrorist groups that do not believe the government's statement or its resolve will not be swayed. As long as \( n_t > h \) for some realizations, the time consistency problem can always surface as recent events in Lebanon have shown. Constitutional constraints or congressional hearings imposing huge perceived cost on those officeholders who capitulate may be the only means of raising \( h \) sufficiently to make precommitment time consistent.

III. Multiperiod Models and Reputational Effects

In the context of hostage-taking incidents, reputational effects refer to the influence that the current government's negotiating behavior has on the beliefs of the terrorists concerning the government's willingness to grant concessions in the future. As before, \( p_t \) denotes the terrorists' beliefs concerning government capitulation in period \( t \), and \( p_{t+1} \) represents their next-period beliefs. We assume the following updating behavior: (i) \( p_{t+1} = p_t \) if there is no opportunity to negotiate in period \( t \); (ii) \( p_{t+1} = p^N_{t+1} \leq p_t \) if the government refuses to capitulate after a successful attack; and (iii) \( p_{t+1} = p^N_{t+1} \geq p_t \) if the government capitulates in period \( t \). Let \( J_{t+1}(p_{t+1}) \) represent the (minimized) expected cost, from the current government's perspective, of an optimal program starting at \( t+1 \), with terrorist beliefs \( p_{t+1} \). Since an increase in \( p \) augments the likelihood of attack, and therefore costs, \( dJ_{t+1}/dp_{t+1} > 0 \).

Public choice considerations are important when analyzing reputation effects. For example, governments that cannot or do not expect to be reelected would be unconcerned about reputation cost unless they are altruistic towards their successor. Even in the latter case, reputation may be nontransferable when terrorists do not believe that the current government's toughness will set the negotiation posture for the succeeding administration. To capture this aspect, we discount reputation costs by the probability \( \pi \) that the current government is in office in the ensuing period. The undiscounted future cost associated with a government capitulation is

\[
\Delta_{t+1}(p_t) = J_{t+1}(p^N_{t+1}) - J_{t+1}(p_t)
\]

\( \geq 0 \).

Given an attack, the government will negotiate ex post if, and only if, \( n_t > [h + \pi \delta \Delta_{t+1}] \), where \( \delta \) denotes the natural discount rate. Deterrence expenditures are chosen ex ante to minimize

\[
TC_t = H(\theta_t) + \Omega_t \theta_t a + \delta [(1 - \Omega_t) + \Omega_t \theta_t] [\pi J_{t+1}(p_t) + (1 - \pi) J_{t+1}(p_0)] \times \{ \delta \pi J_{t+1}(p^N_{t+1}) + (1 - \pi) J_{t+1}(p_0) \} + E(\min[n_t, h + \pi \delta \Delta_{t+1}]),
\]

where \( p_0 \) is the reputation inherited by a new government. Equation (8) assumes the states of the world depicted in Figure 1, as well as the possibility of reelection or defeat for the government in the ensuing period. On the right-hand side of (8), the first term is the deterrence cost; the second is the additional expense (exclusive of reputation cost) to the government in the event of a terrorist attack failure; the third is the reputation cost in the event of no negotiation opportunities; and the fourth is the reputation costs in the situation of negotiation opportunities. If the government does not expect to be in office \( (\pi = 0) \), the ex post negotiation rule and the cost-minimizing deterrence choice associated with (8) would be equivalent to the single-period case where reputation is unimportant.

Another case where reputation does not matter is that of exogenous expectations, or Nash-Cournot behavior, where \( p_{t+1} = p_t \) for

\( ^6 \)Equation (8) also provides the recursive equation for determining \( J_{t+1}(\cdot) \).
all $t$. That is, the terrorists do not use period $t$ outcomes and observations to modify their beliefs about the government’s willingness to capitulate. Since $p_{t+1}$ is then independent of time $t$ outcomes, $\Delta_{t+1}$ is identically zero. Equation (8) then implies that the government’s time-consistent solution is to negotiate if, and only if, $n_t > h$, as in the single-period model. The cost-minimizing choice of $\theta_t$ is also unchanged from that of the single-period model.

This solution is not so naive since what really matters is not reputation per se, but rather the government’s ability through its words and acts to alter that reputation. If terrorist groups believe that they have perfect information concerning $h$ and the distribution of $n_t$, there is no reason for them to modify their beliefs due to time $t$ events. If the terrorists are convinced that the government adheres to the time-consistent rule of capitulating when $n_t > h$, then, with perfect (perceived) information, the terrorists will set $p_t = \text{prob}[n_t > h]$. Moreover, under the circumstances, this will be the optimum negotiating rule for the government. Hence, we conclude that reputational effects are important only under imperfect information.

Nihilistic terrorist groups (for example, Japanese Red Army, Direct Action in France) have a strong distrust of the government’s words and deeds and may well operate under the perception, false or otherwise, of perfect information. If such is the case, then, unless precommitment can eliminate attacks, and there is no assurance of that, the government faces time-inconsistency difficulties when they precommit.

When, however, terrorist groups learn so that their future beliefs are shaped by the government’s current behavior, current capitulation by the government will increase future attacks ($\Delta_{t+1} > 0$), thereby raising costs from negotiations. With these reputation costs, the government will negotiate ex post only if $n_t > [h + \pi \delta \Delta_{t+1}(p_t)]$. Hence, the ex ante true probability that the government will negotiate is $\sigma_t = \text{prob}[n_t > (h + \pi \delta \Delta_{t+1})]$. Hence, an increase in $\pi$ or $\Delta_{t+1}$ will, ceteris paribus, decrease the likelihood of capitulation. Since reputation depends on terrorist beliefs, $p_t$, and the updating rule, the optimizing choice for deterrence depends upon initial conditions and the way in which terrorists learn or modify their beliefs. Thus, an analytical solution is not possible.

If the terrorists have access to the same information set as the government, both agents will know the true probability that the government will capitulate and $p_t = \sigma_t$. Since $\sigma_t$ will then be independent of $t-1$ events, $\sigma_{t+1}$ (and hence $p_{t+1}$) will, by induction, be independent of time $t$ events. Under full information, there are consequently no reputation issues involved in the negotiation decision. The only consistent means of modeling reputation is to assume that the terrorists are uncertain about some aspect of the government information set. Strategic behavior then enters when subsequent events are used to modify the terrorists’ priors.

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