# Provocation and the Strategy of Terrorist and Guerilla Attacks

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**Abstract**

Violent non-state groups that employ terrorist and guerilla tactics are usually weaker than the states they target. Accordingly, theory suggests that groups strategically choose tactics in anticipation of how the state will respond. Yet, we know very little about several fundamental issues related to groups' strategy and choice of tactics. First, the literature lacks compelling empirical evidence across a number of cases about whether and how groups strategically plan attacks in anticipation of government response. Second, we do not know whether groups employ violent tactics to provoke or avoid a forceful government response, although extant theory is consistent with both possibilities. Third, there is little systematic evidence about why groups choose terrorist tactics or guerilla tactics. I develop a theoretical and empirical model of the interaction between groups and governments that generates unique evidence on all three fronts. Using data on attacks in Western Europe from 1950–2004, I show that groups use guerilla attacks to provoke forceful government response, and terrorist attacks to avoid forceful response. Furthermore, I show that groups effectively choose their tactics to avoid forceful government responses that are too damaging for themselves but provoke forceful responses that disproportionately harm civilians. These findings survive several difficult robustness and model specification tests.

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Violent non-state groups face significant obstacles in fighting states. States almost always have considerable advantages in resources and capabilities. The literature on political violence recognizes that power disparities are a central challenge for violent non-state groups, and emphasizes that terrorist and guerilla tactics are often employed by groups because they are "weapons of the weak".[1] Accordingly, the idea that violent non-state groups are strategic actors is widely held among political scientists and policy-makers (e.g., Bloom (2005)). Prominent theoretical ideas in the literature (e.g., Kydd and Walter (2006)) and existing case study work (e.g., English (2003) on the Irish Republican Army) suggest that groups choose tactics taking into account how they expect the government to respond. Given their stark disadvantage in capabilities, groups must carefully anticipate how their choice of tactics affects the government's decision to forcefully respond. Consequently, it is difficult to understand groups' tactical choice without taking governments' responses into account. Unfortunately, existing research lacks a systematic study of group and government interactions with a model that integrates tactical choice and government response.

I argue that integration of tactical choice and government response helps us answer when and why groups choose tactics to avoid or provoke a government response. Much of the existing literature at least implicitly distinguishes between "terrorist groups" that target civilians and "guerilla groups" that target government security forces. However, this distinction is often false as many groups use both guerilla and terrorist tactics (Byman, 2005; Bueno de Mesquita, Forthcoming).[2] Yet, the literature has largely focused on either terrorist or guerilla tactics, which obscures the connection between tactical choice and government response. However, data on attacks and responses in post-World War II Western Europe strongly suggests a connection: while only around 1% of all terrorist attacks elicit a forceful government response, nearly 10% of guerilla attacks are met with forceful response.[3] Thus, there is clearly a connection between groups' tactics and government response, which suggests tactical choice is essential to understanding when groups seek to provoke or avoid forceful response.

Extant theory suggests two main ways in which anticipated state responses to attacks can enter into the strategic calculus of groups. First, attacks that provoke state forces to respond with force

[1] Throughout the paper, I define terrorist tactics as attacks that target civilians, and guerilla tactics as attacks that target the security forces of the state. See Hoffman (2006) for a good treatment of definitional issues.

[2] See Byman (2005, 22–26) for a good discussion of the false distinction between terrorist and guerilla groups.

[3] A robustness test discussed below rebuts the idea that this is an artifact of attackers more often being physically present at the attack when attacking government security forces.

can be dangerous to group survival. Thus, groups often must actively avoid direct engagement with state forces. Failure to avoid state reprisals can be fatal, a point that group leaders recognize. For example, in a 1971 treatise on the urban guerilla, leaders of the Red Army Faction (RAF), a small urban guerilla group based in West Germany, note that it is dangerous "to push [the group] into confrontations that can only lead to defeat (Moncourt and Smith, 2009, 96)." Second, it can also be good strategy for groups to provoke the government to use its firepower in a way that causes civilian collateral damage, but is not fatal to the group. In internal and public discussions of ideal strategy for urban guerillas, RAF leaders also repeatedly cite Brazilian guerilla and public theorist Carlos Marighella, who advocated a strategy of provocation. RAF leader Andreas Baader begins a January, 1972 letter to the press with the following quote from Marighella: "The cops will continue to fumble about in the dark, until circumstances oblige them to see that the political situation has become a military situation (Moncourt and Smith, 2009, 120)." Thus, the premise of a strategy of provocation is to carry out attacks that elicit a forceful response which harm civilians more than group members, helping groups gain support and power. In sum, provocation can be fatal if the government is able to precisely apply force to group members, although there are also potential benefits to provocation.

The central goal of this paper is to understand when groups carry out attacks to provoke forceful government response. Despite general agreement that violent groups strategically choose their tactics, the literature has lagged behind in incorporating state response into empirical analysis of group attacks. First, there is no broad and direct empirical evidence that groups strategically plan attacks in anticipation of government response. Second, if attacks are strategic, when are they designed to strategically provoke a substantial government response or to avoid it? Third, there is little systematic evidence about the motivations behind groups' choice to use terrorist or guerilla tactics. As noted above, tactical choice is related to government response, but we lack clear answers as to why. In this paper, I develop a theoretical and empirical model of groups' tactical choice that generates unique evidence on all three fronts. Theoretically, I bring a focus on the precision with which democratic governments can respond forcefully to group attacks to the literature. I estimate an empirical model uniquely suited to assessing the strategic motivations of groups that deals with the endogeneity problems that arise from the strategic relationship between a group's choice of tactics and the government's decision to respond with force. My analysis of data on attacks in

Western Europe from 1950–2004 demonstrates that guerilla attacks are used as part of a strategy of provocation, terrorist attacks are preferred when groups want to avoid forceful responses, and that government precision in using force is central to tactical choice. The results suggest that groups are remarkably good at choosing tactics to avoid precise forceful responses that effectively target group members, while choosing tactics to provoke forceful responses that harm civilians but do not impose much damage on group members. These findings survive several difficult robustness and model specification tests that rebut the idea that the results are driven by factors like group strength and a number of other possible objections.

## Provocation or Avoidance? Tactics and Government Response

Scholars of political violence have long argued that violent non-state groups use attacks to provoke a draconian government response that produces collateral civilian damage (Merari, 1993; Kydd and Walter, 2006). Recent literature that examines provocation as a strategy focuses mostly on terrorism: Merari (1993) discusses provocation as a "terrorist strategy" and Kydd and Walter (2006) classify provocation as one of five major strategies of terrorism. Similarly, Bloom (2005) argues that groups are likely to provocatively use terrorist tactics as part of an outbidding process when multiple groups compete for support among a constituent population. Existing evidence suggests provocation is a tenable idea, as recent public opinion data shows that state-caused civilian collateral damage has a significant and lasting effect on whether citizen preferences are radical, i.e., amenable to the use of violence, or moderate (Jaeger et al., 2012). Given that terrorist tactics are often thought of as the preeminent "weapon of the weak", a provocation strategy is plausible as it can serve to redress the imbalance between the group and state (Lake, 2002). Yet, guerilla tactics can also provoke a draconian government response. English (2003) notes that Irish Republican Army (IRA) attacks against British security forces frequently elicited a draconian response that was helpful to the IRA. He points out that from 1918–1921, "Crown Forces, frustrated at not being able to convict those responsible for attacking, injuring and killing their comrades, resorted to reprisals targeted against violent opponents, but affecting (and causing disaffection among) much wider numbers than that (English, 2003, 17)." Similarly, in his highly influential treatise on guerilla conflict, Carlos Marighella advocates the use of guerilla tactics to provoke imprecise government response (Marighella, 1971).

The idea that groups use terrorist and guerilla attacks to provoke a harsh government response has intuitive appeal. Moreover, there is some case specific evidence supporting this line of thinking. However, there is a prominent alternative idea in the literature which suggests that groups seek to avoid a harsh government response. Recall that groups which rely primarily on terrorist and guerilla tactics are usually weak relative to the state. Thus, forceful state responses are potentially debilitating to their organization. In an influential article about the causes of terrorism, Crenshaw (1981, 382–383) emphasizes that the most salient deterrent of terrorism is the government's ability to react repressively to violence. McAdam (1982) provides evidence that a lack of repression facilitated the use of political violence by groups in the fight for civil rights in the United States. More recently, Li (2005) argues that the constraints upon a government's ability to effectively react to attacks increases the strategic incentives of groups to use violence. In contrast, attacks are less likely in countries where the government is quite able to respond forcefully. In a similar vein, the theoretical frameworks of Sandler, Tschirhart and Couley (1983) and Bueno de Mesquita (2005*a*) both suggest that government counterterrorism actions have a negative effect on the welfare of a group. The larger implication is that if the net effect of a harsh government response is negative for a group, it will try to plan attacks that do not provoke a forceful government response.

Interestingly, the extant literature suggests that both strategies of provocation and avoidance are most effective against democratic governments. Scholars such as Li (2005) and Pape (2003) suggest that democracies are attractive targets because they are unable to respond swiftly and forcefully to groups. Constraints on the use of force also led scholars to argue that a provocation strategy is effective against democracies, as they are unable to employ a maximally brutal "scorched earth" response to an attack (Kydd and Walter, 2006, 70–72).[4] While democratic governments usually face real constraints, they also face more direct public pressures to respond in a firm and observable way to attacks (Kydd and Walter, 2006; Richardson, 2006; Bueno de Mesquita, 2007). This pressure often leads to measures that increase the government's ability to use force against groups, such as the development of special anti-terrorism units (Chalk, 1993) or restrictions on civil liberties (Dragu, 2011). The coupling of significant constraints on the use of force with incentives to

[4]See Valentino (2005) for evidence of how genocide, the harshest of such scorched earth responses, can be used to suppress rebel movements.

respond observably to threats leads democracies to be especially prone to a strategy of provocation.

In sum, there is a tension in the literature between the idea that violent groups choose tactics to provoke the government and the idea that they choose tactics to avoid forceful response. I argue that the precision with which democratic governments can respond to attacks is central to whether groups prefer provocation or avoidance of forceful response. Relatedly, if a government's forceful response to a tactic is too imprecise, a democratic government is unlikely to find forceful response attractive. Unfortunately, we know little about the precision with which governments can forcefully respond to terrorist or guerilla attacks. In one of the few related systematic studies, Benmelech, Berrebi and Klor (2010) show that indiscriminate and imprecise Israeli punitive home demolitions are associated with a greater number of subsequent suicide attacks, while demolitions that precisely target the homes of known group members have the desired effect of decreasing violence. While this provides clear evidence that the precision of government response matters, it does not tap directly into how groups strategically choose tactics in anticipation of government response. To understand how and whether groups choose tactics to provoke or avoid a forceful government response, I develop a theoretical and empirical model of the strategic relationship between groups and governments.

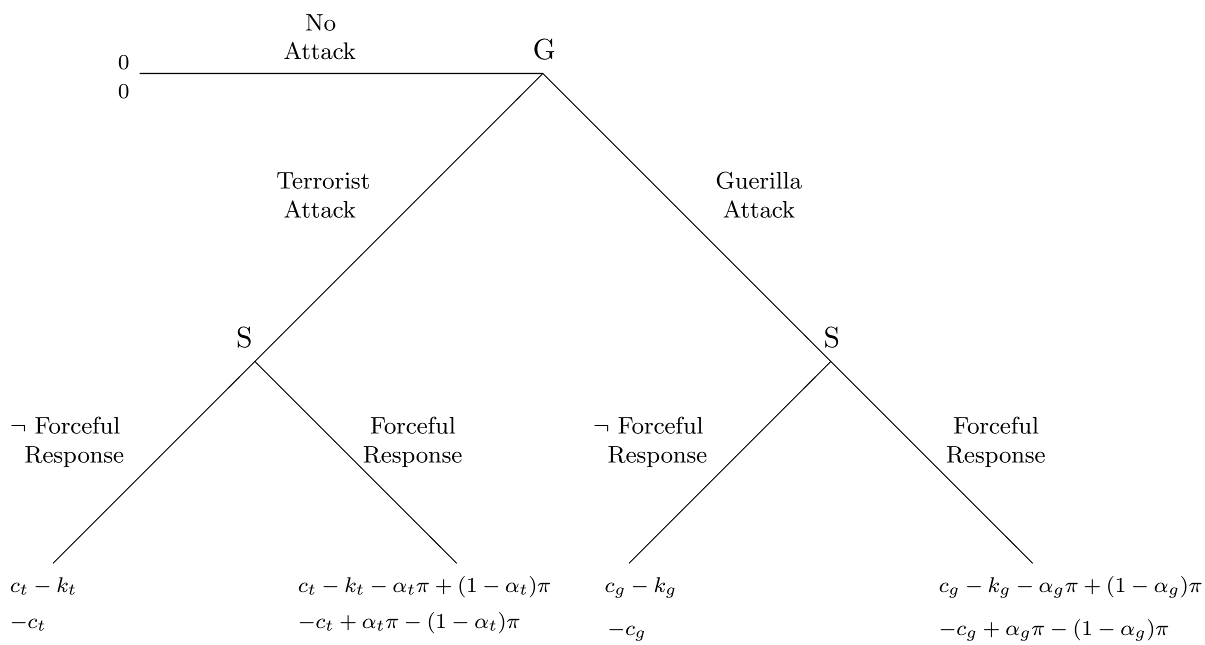
## Theoretical Model

Three main factors influence the effectiveness of a strategy of provocation for groups. First, provocation requires a forceful response from the government. Second, the appeal of provocation for the group hinges critically on its ability to absorb the costs of a forceful government response. Third, provocation does not work unless the government's response results in collateral damage among non-group members of the population that hurt the government and help the group. I develop the simplest possible theoretical model that allows analysis of the circumstances under which a group's optimal strategy is to use either terrorist or guerilla tactics, or both, to provoke forceful response from a completely informed government.[5]

[5] I assume that both the group and the state have complete information. It is more interesting to identify the conditions under which fully informed governments will be provoked and fully informed groups will provoke or avoid than to show that information asymmetry can lead to provocation. It is quite obvious that if the government lacks information about the group's ability to avoid its reprisals that it might use a forceful response when it is counterproductive. However, I show below that provocation is possible even when there is no informational asymmetry. Another possible way to model provocation is via domestic pressure on the government to react forcefully. See the appendix for a version of the model that assumes the government pays a cost for not responding to an attack that increases in attack severity. The key insights are no different than those from the model presented here.

The game has the structure depicted in figure 1. First, the group decides whether to carry out a terrorist attack, a guerilla attack, or no attack. If the group does not attack, both players receive the status quo payoff of 0. If the group chooses to attack employing either terrorist or guerilla tactics, the government decides whether to respond forcefully or not. If the group employs terrorist tactics and the government does not respond forcefully, the group receives a payoff of $c_t - k_t$, while the state receives a payoff of $-c_t$. The parameter $c_t$ represents the damage imposed by a terrorist attack, of which the most prominent element involves civilian deaths and injuries. The group receives higher payoffs from more damaging attacks, while the state pays higher costs for an attack as it imposes more damage. The costs of carrying out the attack for a group are captured by $k_t > 0$.

Figure 1: The Strategic Attacks Game




If the group carries out an attack and the government responds with force, the players' payoffs reflect the damage the government response imposes on the group and the collateral damage to civilians. If the group targets civilians and the government responds forcefully, the group receives a payoff of $c_t - k_t - \alpha_t\pi + (1-\alpha_t)\pi$. The $\alpha_t \in [0,1]$ parameter represents the proportion of damage that the government's response to a terrorist attack imposes on group members versus civilians.

The parameter $\pi > 0$ captures the amount of human damage that results from the government's forceful response. Thus, as $\alpha_t \to 1$, the government is becoming increasingly precise in targeting group members, while as $\alpha_t \to 0$ the government response is increasingly producing collateral damage among civilians. In sum, the group benefits as the proportion of the damage from the government's response inflicted on civilians increases, and is harmed as the government is able to more precisely target its own members. The government's payoff following a terrorist attack and its forceful response is $-c_t + \alpha_t \pi - (1 - \alpha_t)\pi$. Thus, it benefits from accurately targeting group members and pays a cost for collateral damage it imposes on the civilian population.

If the group chooses to directly target government forces by employing guerilla tactics, group and government payoffs are analogously defined. The only difference is that both players' payoffs are subscripted by $g$, to indicate that the group carried out a guerilla attack, rather than $t$, which indicates a terrorist attack. For example, if the group carries out a guerilla attack and the government responds forcefully, the group receives a payoff of $c_g - k_g - \alpha_g \pi + (1 - \alpha_g)\pi$ and the government receives $-c_g + \alpha_g \pi - (1 - \alpha_g)\pi$. This formulation allows the damage imposed by a guerilla and terrorist attack to differ, the costs of the two tactics to differ for the group, and the government's precision in its response to each tactic to differ. The players' payoffs for each possible outcome in the game are summarized in figure 1.

The model is consistent with several prominent mechanisms by which provocation helps the group and hurts the government. For instance, Bueno de Mesquita (2005*b*) argues that government response can generate economic externalities that facilitate recruitment, while Lake (2002) and Kydd and Walter (2006) argue that forceful government response radicalizes moderates and facilitates recruitment. Similarly, Rosendorff and Sandler (2004) suggest that forceful government responses increase grievances among the population, which aids group recruitment efforts. I simply assume that when a forceful government response causes civilian casualties and damage, this hurts the government and helps the group.

There are two potential objections to the assumptions of the model which I briefly address here. First, the idea that groups benefit from all civilian casualties resulting from terrorist attacks is contestable. It is possible that the group tries to target civilians that are from a portion of society that are not potential supporters (e.g., Catholics vs. Protestants in Northern Ireland), and that it actually pays a cost for hitting the "wrong" civilians. If a group hits the "wrong" civilians, the backlash to the group from it's target constituency could plausibly be analogous to the backlash the government receives when it harms civilians with forceful responses. To account for this idea, I also analyze a version of the model in which the group gains only from casualties among a portion of civilians and pays costs for harming the "wrong" civilians. The basic character of the results is the same, although the conditions under which carrying out terrorist or guerilla attacks makes sense for the group are more restrictive as the group's accuracy decreases.[6]

A second potential objection is that the above model does not contain any bargaining between the government and group. As shown by Fearon (1995), bargaining often makes conflict under complete information inefficient, which might make both violent group attacks and forceful government responses suboptimal. However, the set of violent sub-state groups I focus on in this paper are almost always far too weak to be involved in negotiations with the government. The literature on violent non-state actors emphasizes that groups carry out painful attacks to demonstrate to the government that they are capable enough to be taken seriously (e.g., Kydd and Walter (2006)).[7] Groups that are very successful might eventually be seen as serious enough threats to become involved in negotiations with the target government, but this is rare and typically takes place after years of successfully having shown itself to be a force to be reckoned with via painful attacks. Thus, the idea that relatively weak groups try to demonstrate and build upon their capabilities by carrying out as damaging of attacks as possible (conditional on the cost, $k_i$, not being too high) is theoretically reasonable.[8]

### Equilibrium Conditions

I use the sub-game perfect equilibrium (SPE) refinement to analyze the game. As play is sequential and the players have complete and perfect information, there is a unique equilibrium in pure strategies for any distribution of the model's parameters (Mas-Colell, Whinston and Green, 1995, 276). Table 1 summarizes the equilibrium conditions for the state and group in the game. The table lists all possible equilibrium paths of play for the state and group along with the corresponding equilibrium conditions that must hold for each path of play to be optimal.[9]

[6] See the appendix for this version of the model.

[7] This argument is also put forth by Pape (2003), as he argues that the extraordinary destructiveness of suicide attacks leads groups to often "succeed" by entering into negotiations with the government.

[8] See the supplemental appendix for an empirical assessment of this claim.

[9] It is possible for each path of play to be optimal in equilibrium.

The table reflects the logic of backwards induction, with each row representing a possible equilibrium path of play for the government and group. Thus, the column on the far left lists the three possible equilibrium paths of play for the state when it has experienced an attack. The equilibrium condition that must hold for this path of play to be optimal for the state is noted in the next column to the right. The column to the right of the government's equilibrium conditions states the possible paths of play for the group given that the government plays the strategy listed to the left in the same row. The final column states the equilibrium condition for the group that must hold for the path of play to be optimal. To simplify the notation in the table, I denote the tactic chosen by the group as tactic $i$, while the tactic not chosen is tactic $j$. This notation facilitates the presentation of general and parsimonious equilibrium conditions. Accordingly, I subscript all parameters in the players utilities here with $i$ and $j$, where $i \in \{t, g\}$ and $i \neq j$. If the chosen tactic is a guerilla attack, then $i = g$ and $j = t$, which means that the tactic not chosen is terrorism.

The government's decision to employ a forceful response to an attack using tactic $i$ hinges on its precision in targeting group members, i.e., $\alpha_i$. The government uses force in response to either tactic if enough of the damage it will inflict hits group members rather than civilians. In all the government's equilibrium conditions, at least 50% of the damage sustained from a forceful response must target group members.[10] This straightforward equilibrium condition indicates that the government is quite smart in its use of force, as it will only use force when more of the resulting damage inflicts group members than civilians. The group's equilibrium behavior when a forceful government response is possible also depends on $\alpha_i$, the precision of the government's response. If the government responds forcefully to the use of tactic $i$, the group will employ the provocative tactic $i$ if a large enough proportion of the damage from the government's response afflicts the civilian population rather than its own members. As a baseline, if $c_i - k_i = 0$ then at least 50% of the damage from the government's response must afflict the civilian population, which is the opposite of the government's condition on $\alpha_i$. The group is willing to tolerate a smaller (larger) proportion of civilian (group) casualties as the difference between the direct payoff from using tactic $i$, i.e., $c_i - k_i$, versus the alternative increases. This allows it to be simultaneously optimal for the group to provoke the state and for the state to be provoked. For example, if the relevant comparison

[10] If we allow the government's utility from $\pi$ to be a non-linear but monotonic function of $\alpha_i$, the proportion of damage that afflicts group members versus civilians, the character of the results does not change. However, the cut-point for $\alpha_i$ is no longer necessarily $\frac{1}{2}$. I assume a linear function to make the equilibrium conditions straightforward.

to tactic $i$ is no attack, then the group compares $\alpha_i$ to $(c_i - k_i) - 0$. If both tactics are provocative, the baseline level of damage in the comparison between tactics $i$ and $j$ is $\alpha_j$, or the proportion of damage from the government's response that the group would face if it employed tactic $j$. Finally, if neither tactic provokes a government response, the group's tactical choice is driven solely by the direct payoffs from the attack.

Figure 2 depicts the range of parameters for which provocation is possible in equilibrium.[11] Government accuracy in targeting group members with force is depicted on the x-axis, while the severity of the group's attack, $c_i$, is depicted on the y-axis. The area of the plot shaded with black diagonal lines depicts the region where the government would employ forceful response, but the group does not provoke such a response because it is too damaging relative to its payoff. The solid black shaded region depicts the area where the government forcefully responds and the group provocatively attacks. The area shaded by solid grey shows the region for which the group attacks and the government does not forcefully respond, while the remaining white area depicts the range of parameters where no attacks occur and the government would never forcefully respond. The diagonal boundary between the black shaded region and the region where the group does not provocatively attack (shaded with black-diagonal lines) shows how the group tolerates higher casualty levels as its direct payoff to attack increases. The positive slope of the boundary shows how higher direct payoffs (i.e., the y-axis) are necessary to sustain provocation with a more accurate government (i.e., the x-axis). In fact, when government accuracy is greater than 50%, which makes forceful response optimal for the state, the group's direct payoff from attack has to be positive for provocation to occur.

## Empirical Implications

Analysis of the model's equilibrium allows us to develop hypotheses about connections between tactical choice and the provocation of a forceful government response. Using the language of the statistical model, I discuss the actors' choices probabilistically. Thus, all else equal, if increasing a parameter makes the equilibrium condition for the group's decision to provoke the government using a guerilla attack easier to satisfy, i.e., less restrictive, I note that this increases the probability

[11] The figure assumes the government plays a conditional strategy, i.e., the path of play in row 2 of table 1, where tactic $i$ is provocative and tactic $j$ is not. The depiction is similar if we assume both tactics elicit forceful response, i.e., row 1. See the appendix for details on the parameter values.

that the guerilla tactic is chosen.[12] Finally, I focus primarily on the implications for provocation here, as this is the central theoretical focus.

All three inequalities in the second column of table 1 indicate that the government is more likely to respond to an attack that employs either terrorist or guerilla tactics as its precision in targeting group members, i.e., $\alpha_i$, increases. Accordingly, the probability of a forceful response should increase in $\alpha_i$ regardless of the tactic chosen. Expectation 1 summarizes the relationship between $\alpha_i$ and the probability of a forceful government response.

**Expectation 1.** *All else equal, the government is more likely to respond forcefully to an attack as the proportion of the damage it inflicts on group members relative to civilians, or $\alpha_i$, increases.*

Given our interest in understanding whether and how government response varies with the tactic chosen, we outline how the probability of a forceful response can vary by tactic. Examination of the government's equilibrium conditions in table 1 suggest that the government is more likely to employ a forceful response to tactic $i$ than tactic $j$ if it can target group members with greater precision following tactic $i$. For example, the state may be able to more effectively target group members following a terrorist attack than a guerilla attack, i.e., $\alpha_t > \alpha_g$. Governments need information on the attackers and their whereabouts to precisely use force. Attacks on civilians typically take place in crowded areas where there are a lot of potential witnesses to the attack and its setup. In contrast, attacks on government forces often take place at police barracks, or areas that are less populated with bystanders that can provide information.

**Expectation 2a.** *All else equal, if $\alpha_t > \alpha_g$, the probability the government responds forcefully is higher following a terrorist attack than a guerilla attack.*

On the other hand, it is quite plausible that governments are more effective at responding forcefully to attacks on their own security forces than to attacks on civilians. Attacks on government forces directly threaten state authority. Della Porta (1995) notes that in post-World War II Germany and Italy guerilla attacks against state forces were closely associated with forceful government

[12]It is of course possible to introduce bounded rationality, or a similar assumption, into the theoretical model so that the actions in the theoretical model are also probabilistic. I do not do so to make the exposition of the theory as simple as possible. In general, the direction of our expectations for a particular parameter using SPE will not differ from what would hold under a quantal response equilibrium solution concept (or something similar) unless the error terms are parameterized with the same variables as the utilities. We do not do this as it is not implied by the theory and unnecessarily complicates the analysis.

responses. Given that the group directly attacks state forces, it is plausible that the government can more precisely target group members in response to guerilla attacks. Members of the police forces or military actually observe attacks against their own forces and thus do not need to rely as heavily on information from civilian witnesses. Thus, it is also plausible that the government has better intelligence following guerilla attacks, which facilitates more precise forceful response.

**Expectation 2b.** *All else equal, if $\alpha_g > \alpha_t$, the probability the government responds forcefully is higher following a guerilla attack than a terrorist attack.*

These expectations are helpful building blocks, as their assessment is essential to understanding whether the group uses either guerilla or terrorist tactics to provoke a forceful government response. Provocation is not a tenable strategy if neither terrorist nor guerilla tactics is likely to provoke a forceful government response. We know from the equilibrium conditions in table 1 that a tactic $i$ is provocative to the government if $\alpha_i > \frac{1}{2}$. Thus, if groups do attempt provocation, they must anticipate the government's propensity to respond forcefully to different tactics and plan their attacks accordingly. However, for provocation to be a good strategy for groups: 1.) government response must impose civilian collateral damage, and 2.) groups must be able to absorb the costs of government response to their membership. Thus, $\alpha_i$ must not be so high that the group bears too disproportionately the brunt of the government's response. Specifically, the equilibrium conditions for the group in table 1 suggest that when $\frac{c_i - k_i}{2\pi}$ is positive, there is a range of $\alpha_i$ such that provocation is optimal for both group and government.

The proportion of casualties that hurt civilians versus group members is also crucial to the group's strategy. Examination of the group's equilibrium conditions in the first two rows of table 1 make clear that when a tactic will provoke government response, there is a cut-point on $\alpha_i$ that determines whether provocation is optimal for the group. If only tactic $i$ is provocative, then $\alpha_i$ must be smaller than the threshold identified in the second row of table 1. Similarly, if we analyze the group's comparison of tactics $i$ and $j$ when they are both provocative, i.e., $\alpha_i < \alpha_j + \frac{(c_i - k_i) - (c_j - k_j)}{2\pi}$, we see again that there is a cut-point after which $\alpha_i$ is too high for provocation using tactic $i$ to be optimal. The upshot is that, all else equal, there will be a cut-point for $\alpha_i$ after which provocation is not optimal because of the high proportion of damage inflicted on the group's organization and membership.

For the purposes of illustration, the graphs in figure 3 assume that guerilla tactics are provocative, while terrorist tactics are not provocative. Both graphs show the group's propensity to choose the tactic that provokes the government to forcefully respond. The graphs illustrate how increasing the number of casualties that result from the government's response affects the group's propensity to choose the provocative strategy. The graph in figure 3(a) shows the relationship when $\alpha = 0.52$, while the graph in figure 3(b) shows the relationship when $\alpha = 0.60$.[13] Figure 3(a) demonstrates that when state caused civilian casualties are relatively high and just under 50% of the damage from government response affects civilians, the provocative tactic is optimal for a wider range of state-caused group casualties. In contrast, 3(b) shows that when a forceful response results in the group receiving 60% of the damage, the provocative tactic is optimal for a much smaller range of $\pi$.

There are numerous historical examples of terrorist tactics employed as part of a provocation strategy. For instance, fledgling Armenian rebels used a provocation strategy against the Ottomans in the 1890s. Walter Laqueur notes that "...since they could not possibly hope to overthrow the government, their strategy had to be based on provocation. They assumed that their attacks on the Turks would provoke savage retaliation, and that as a result the Armenian population would be radicalized (Laqueur, 1987, 43)." Indeed, the *Program of the Armenian Revolutionary Foundation*, drafted in an 1892 meeting at Tiflis, stated that rebels were "[t]o stimulate fighting and to terrorize government officials ..." (quoted in Nalbandian (1963, 168)). The Armenian rebels chose to attack civilians connected to the Ottoman state in the expectation that government forces would mercilessly respond and impose a high proportion of collateral civilian damage. Expectation 3a summarizes the idea that terrorist tactics are connected to a strategy of provocation. The expectation applies when provocation is an optimal strategy for the group, meaning that $\alpha_t$ is less than the relevant cut-point identified in the last column of table 1.

**Expectation 3a.** *If terrorist tactics are provocative, all else equal, the probability the group employs a terrorist attack increases in government-caused damage up to a specific threshold of group damage.*

[13] Given that we are examining pure strategies, the model is deterministic, i.e., the probability of choosing the provocative tactic is zero or one. However, if we allowed for agent error as in the statistical model, the character of our results would not change unless we parameterized the error with some of the variables of interest.

The idea that guerilla tactics are effective in provoking a forceful government response also finds numerous instances of support in the historical record. In a study of the repression of political movements in 19th century Europe, Goldstein notes that states which employed more forceful responses to attacks on its forces also subsequently experienced more violent groups (Goldstein, 1983, 333–343).[14] The violent responses were seen as a means to force the state to disrupt the daily lives of citizens and foster sympathy for the group. Similarly, in post-World War II Germany and Italy the propensity of the state to forcefully respond to attacks on its security forces were explicitly used as reason to target them. Thus, forceful police responses such as the one in West Berlin that led to the death of activist Benno Ohnesorg and numerous other injuries in 1967 helped make more activists amenable to the use of violence. The public outcry over the death of Ohnesorg (and numerous injuries) demonstrated the effectiveness of this strategy in discrediting the state. In fact, the Brazilian Marxist revolutionary Carlos Marighella explicitly advocated targeting government forces to provoke a draconian response. He argued that following guerilla attacks "[t]he government has no alternative except to intensify repression. The police networks, house searches, arrests of innocent people and of suspects, closing off streets, make life in the city unbearable (Marighella, 1971, 99)." Thus, provocation is quite a plausible strategy via the use of guerilla tactics as well.

Expectation 3b summarizes the idea that guerilla attacks are the preferred tactic in a strategy of provocation. Analogous to Expectation 3a, Expectation 3b applies when provocation via guerilla attack is an optimal strategy for the group, meaning that $\alpha_g$ is less than the relevant cut-point identified in the last column of table 1.

**Expectation 3b.** *If guerilla tactics are provocative, all else equal, the probability the group employs a guerilla attack increases in government-caused damage up to a specific threshold of group damage.*

Note that expectations 3a and 3b do not precisely identify the threshold for group casualties. However, they do indicate that there will be a clearly identifiable threshold for a provocative tactic such that we see a relationship similar to that shown in figure 3. To summarize, three things must be true to observe provocation. First, the government must find the use of a forceful response to be

[14] It is important to note that while Goldstein's claims are consistent with the theoretical argument here, his evidence is not conclusive as he is not able to rule out the possibility that more forceful responses are simply applied to more violent groups. Below, I am able to systematically control for how the level of violence affects both government and group utilities (and the strategic choice of tactics by groups), which helps deal with this problem.

optimal for at least one tactic. Second, for the group to find provocation attractive the government's response must impose some civilian collateral damage. Third, the group must be able to absorb the costs to its membership from a forceful response. For all three points to be satisfied it must be true that $\alpha_i \in (\frac{1}{2}, \sigma)$, where $\sigma$ is the relevant cut-point for the group in the last column of table 1.

On the other hand, if the government's level of precision, i.e., $\alpha_i$, is too high for a provocative tactic, then provocation is never an optimal strategy for the group.[15] If this is the case, the group will be significantly less likely to employ a provocative tactic. Thus, if guerilla attacks are provocative and terrorist attacks are not, all else equal, the group will always be less likely to use guerilla tactics relative to terrorist tactics or not attacking. Consequently, neither expectation 3a nor expectation 3b will find support. We summarize the possibility that provocation is never an optimal strategy in the following expectation.

**Expectation 4.** *If the government's level of precision in targeting group members with a forceful response is too high for both tactics, a strategy of provocation is never optimal.*

In sum, the theoretical model identifies empirical expectations for government and group behavior. The model suggests the conditions under which we can expect to see a forceful government response to either tactic, as well as identifying a plausible reason why forceful response may be more common following one tactic versus another. Furthermore, the model provides expectations regarding the empirical patterns we should observe if a strategy of provocation via guerilla or terrorist tactics is indeed an optimal strategy for groups.

## An Empirical Approach

I now develop a statistical version of the theoretical model. Specifically, I derive a statistical model that includes the group's choice to refrain from attack, to carry out an attack against civilians, or to carry out an attack against government forces, and also includes the government's choice to respond with force or not to either an attack against civilians or its own security forces. Given that the theory and all of its predictions presume that violent groups choose tactics strategically, development of a model with the same strategic structure as the theoretical model allows unbiased estimation of group and government utilities (Signorino and Yilmaz, 2003). Furthermore, by explicitly modeling

[15] In terms of the model's parameters, this means that $\alpha_i > \sigma$.

how group tactical choice strategically anticipates government response I am able to deal with difficult endogeneity problems in the analysis of group tactical choice.[16]

In the theoretical model depicted in figure 1, both the state and the group make no errors in their decision-making, an assumption that I relax to make the theoretical model a statistical model. Specifically, in the statistical model I make the plausible assumption that both the group and the state are boundedly rational (Simon, 1997). That is, for each possible choice in the game they randomly err in making the optimal choice. Given a probability distribution for the error terms, I derive a variant of the quantal response equilibrium solution concept (QRE). The subgame perfect equilibrium solution concept used to solve the theoretical model is a special case of the QRE in which neither the state nor the group make errors (Signorino, 1999, 2003). Thus, while the empirical model is structurally consistent with the theoretical model, it is also more general as it accommodates the idea that groups and governments at times make errors in decision-making.[17]

I outline the logic behind the statistical model by first deriving the equations used to estimate the state's choice probabilities and then those for the group's choice probabilities. Both the state and the group compare the expected utility of each possible choice in the game and make the optimal choice (with error). The state has two possible choices in the game. First, if the group carries out a terrorist attack, the state decides whether to forcefully respond or not. Similarly, the state also decides to forcefully respond or not following a guerilla attack. Suppose that in observation $i$, the group carries out a terrorist attack; then, the probability the state forcefully responds depends on a comparison of the expected utilities for forceful responding and not forceful responding:[18]

$$p_{i,4} \quad = \quad Pr[U_S(Gov\ F) + \epsilon_4 > U_S(Gov\ \neg F) + \epsilon_3]. \tag{1}$$

[16]For example, assume I estimate a non-strategic model of group tactical choice (with or without fixed effects) and found that groups are more likely to target civilians when government accuracy is lower. This might be interpreted as evidence in favor of the idea that terrorism is used to provoke the government. However, if groups choose terrorist or guerilla tactics in anticipation of the likelihood the government will respond forcefully (which also depends on accuracy), and the government is more likely to respond with force to guerilla attacks (both of which I show below to be true), endogeneity makes this a spurious finding. In short, if governments are much more likely to respond with force following guerilla attacks because they are able to more accurately target groups, lower government accuracy following terrorist attacks is reflective of the fact that governments are not generally provoked following terrorist attacks. Thus, it is not evidence that terrorism is generally associated with a strategy of provocation.

[17]Assuming that the uncertainty is the product of privately held information leads to a very similar probability model (Signorino, 2003).

[18]Note that the labels for both the state's and group's utilities over each outcome correspond to those used in table 2 below. Furthermore, the indexing for the probabilities, e.g., $p_{i,4}$, correspond to the choice probabilities in figure 4.

If the group carries out a guerilla attack, the probability the state responds forcefully or not to a guerilla attack is analogously written as:

$$p_{i,6} \quad = \quad Pr[U_S(Civ\ F) + \epsilon_6 > U_S(Civ\ \neg F) + \epsilon_5]. \tag{2}$$

As is central to the theory undergirding the paper, the group strategically anticipates expected government response in deciding to carry out an attack against civilians, against government security forces, or to refrain from attack. Thus, the group makes an expected utility calculation that incorporates the probability the government will respond with force to either tactic. For instance, the probability it carries out a terrorist attack is written as:

$$p_{i,1} \quad = \quad Pr[U_G(Civ\ F) * p_{i,4} + U_G(Civ\ \neg F) * p_{i,3} + \epsilon_1 > \tag{3}$$

$$max\{U_G(Gov\ F) * p_{i,6} + U_G(Gov\ \neg F) * p_{i,5} + \epsilon_2,\ U_G(\neg\ Attack) + \epsilon_0\}]. \tag{4}$$

Thus, the probability the group attacks civilians, or $p_{i,1}$, depends on the comparison of its expected utility for a terrorist attack (expression 3), to both its expected utility for a guerilla attack and its utility for not carrying out an attack (expression 4). The expected utilities incorporate both the group's utility each outcome, e.g., $U_G(Civ\ F)$, and the probability the state will respond such that the outcome is realized, e.g., $p_{i,4}$. The probabilities that the group chooses to carry out a guerilla attack ($p_{i,2}$) or to refrain from attack ($p_{i,0}$) are defined analogously.

I do two things to make statistical estimation of these choice probabilities possible. First, I specify the group and state utilities over outcomes, e.g., $U_G(Civ\ F)$, with substantive regressors.[19] Figure 4 shows how the players' utilities are specified with regressors in the game. I normalize the group's utility for not carrying out an attack to 0, and also normalize the state's utilities for not forcefully responding to an attack to 0. This aids in identification of the model and also ensures that the coefficients in the group's utilities are interpreted relative to no attack, while the coefficients in the state's utilities are interpreted relative to if it had not forcefully responded to an attack.

Second, I specify a probability distribution for the error terms, which yields a probability model that can be estimated. I assume that the error terms, $\epsilon_{ij}$, are independently and identically

[19] The estimated utilities for the group are denoted with $Z\gamma$, where the the variables in the group's utilities are $Z$, while the estimated coefficients are denoted with $\gamma$. The estimated utilities for the state are denoted with $X\beta$, where the variables in the state's utilities are denoted with $X$ and the coefficients are denoted with $\beta$. The specific regressors used to measure the parameters of the theoretical model are discussed in the data section below.

distributed Type 1 Extreme Value, which yields the widely used logit probability expressions.[20] Thus, the probability the government responds with force to a terrorist attack, i.e., $p_{i,4}$, is estimated with the following equation:

$$p_4 = \frac{exp^{X\beta}}{1 + exp^{X\beta}}, \tag{5}$$

$$p_3 = 1 - p_4. \tag{6}$$

Equation 5 indicates that a logit model can be used to estimate the probability the government forcefully responds to the group's attack. The probability the government responds with force or not following a direct attack, $p_6$, is analogously defined.

The group's choice of tactics is more complicated, as it is conditioned on the expected reaction of the government. Given the same distributional assumptions as in equations 5–6, the probabilities the group chooses to directly attack the government via guerilla tactics, $p_2$, chooses to attack civilians, $p_1$, or chooses to refrain from attacking, $p_0$, are

$$p_2 = \frac{exp^{(p_5 Z\gamma + p_6 Z\gamma)}}{1 + exp^{(p_3 Z\gamma + p_4 Z\gamma)} + exp^{(p_5 Z\gamma + p_6 Z\gamma)}} \tag{7}$$

$$p_1 = \frac{exp^{(p_3 Z\gamma + p_4 Z\gamma)}}{1 + exp^{(p_3 Z\gamma + p_4 Z\gamma)} + exp^{(p_5 Z\gamma + p_6 Z\gamma)}} \tag{8}$$

$$p_0 = 1 - p_2 - p_1. \tag{9}$$

The probability the government responds to a particular tactic with force or not is estimated as outlined above. For example, the probability the government responds with force to a terrorist attack, i.e., $p_4$, is estimated using equation 5. This builds a (game-theoretic) probability model with boundedly rational players.[21]

Given that I can now estimate the government's and group's choice probabilities, I construct a log-likelihood function to maximize. I use data on the observed actions of the group and government to create variables, $d_{i,j}$, that indicate for each observation $i = 1 \ldots n$ which outcome is reached in the model, where the possible outcomes are $j \in \{0, 3, 4, 5, 6\}$.[22]

$$ln(L) = \sum_{i=1}^{n} d_{i,0} ln(p_{i,0}) + d_{i,3} ln(p_{i,3}) + d_{i,4} ln(p_{i,4}) + d_{i,5} ln(p_{i,5}) + d_{i,6} ln(p_{i,6}). \tag{10}$$

[20] The $i$ refers to the player where $i \in \{G, S\}$ and $j$ refers to the action, where $j \in \{0, \ldots, 6\}$. An assumption of normally distributed errors would lead to probit probabilities.

[21] For additional details on how the derivation of this type of strategic choice model, see Signorino (2003).

[22] The outcome indicators $j$ correspond to the subscripts on the action probabilities in figure 4. For instance, $j = 0$ indicates that the group does not attack, while $j = 4$ indicates that the group targets civilians and the government forcefully responds.

The log-likelihood is estimated in three steps via statistical backwards induction (SBI). First, I estimate a model for the government's response to an attack on civilians, i.e., equation 5. Second, I estimate a model for the government's response to an attack on its security forces. Finally, I estimate a model of the group's choice of tactics conditional on the expected government response, i.e., equations 7-8, using the probability estimates, i.e., $p_{i,3} - p_{i,6}$, from the first two stages to account for government response. Bas, Signorino and Walker (2007) demonstrate that a method of statistical backwards induction (SBI) works well in the estimation of this type of discrete choice game.[23] Although the SBI technique is employed by separately estimating the appropriate equation for each possible decision in the game rather than simultaneously estimating the full system of equations, this does not at all change the underlying probability model. Assurance of concave likelihood functions and ease of estimation are among the advantages of SBI over simultaneous estimation of the full system of recursive equations. One known issue with the SBI technique that affects the strategic attacks game is that the standard errors for any estimates at stages prior to the final move in the game are biased downwards. The bias results from treating the estimated probabilities as fixed data, when they are estimated with error. In our context, this suggests that the standard errors for the group's utilities are biased if left uncorrected. Following Bas, Signorino and Walker (2007), I bootstrap to correct the standard errors.

## Data

I utilize data from the Terrorism in Western Europe Event Data (TWEED) project (Engene, 2004). The data include all violent attacks carried out by a domestically based group that occurred in Western Europe from 1950–2004. Importantly, it includes attacks on civilians, attacks on government forces, and contains detailed information on government response to each attack. The unit of analysis is the attack, where for each attack a group decides whether to target civilians or to target government security forces. This formulation is consistent with the observation that many groups mix terrorist and guerilla tactics, as a group can choose to attack civilians today and target government security forces subsequently. The focus on attacks by domestic groups is an important strength given that forceful government response is generally more complicated for

[23] A similar approach is outlined in Carrubba, Yuen and Zorn (2007).

groups based whose primary bases are on foreign soil (Bapat, 2007; Schultz, 2010). The TWEED data provides unusually good temporal coverage, which allows for variation within countries on key variables. Given the theoretical focus on democratic countries, I only include the observations where a country is democratic in our sample.[24] Almost 95% of the observations are in democracies.

The focus on Western Europe has several important advantages. First, Western Europe experienced a significant amount of political violence. In fact, for three decades out of the five decades in our sample, 1960s–1980s, Western Europe experienced more attacks than any other region in the world (Chalk, 1993). Second, the vast majority of governments in post-World War II Western Europe are democratic, which suggests that a provocation hypothesis is plausible as such governments cannot easily carry out maximally brutal strategies, but remain susceptible to public pressure to respond forcefully. More specifically, during the period of study a number of Western European countries, such as West Germany, France, Spain, the United Kingdom, and Italy passed legislation that granted far greater repressive powers to their security forces to deal with terrorism and also created anti-terrorist assault forces to forcefully target groups. Furthermore, the special anti-terrorist assault forces created during the 1960s and 1970s represented a departure from the principle of "minimum force" to an overriding concern to sustain "minimum losses" to their own personnel. Chalk (1993) notes that militarily trained units, such as Germany's GSG-9, in practicing the principle of "minimum losses" in effect began to resemble units using "maximum force". In other words, the key governments in question are relatively constrained democracies but also empowered their security forces to deal forcefully with groups, which implies that they had capacity and ability to use force. In sum, Western Europe of the post-WWII era has the key characteristics necessary and is perhaps even ideal given our theoretical focus.

### Dependent Variables

The model depicted in figure 4 has three dependent variables. The first indicates the group's choice of tactics, while the second and third indicate whether the government responds forcefully to attacks on civilians or government forces, respectively. I first describe the variable that indicates the group's choice of tactics, then discuss the coding of the government's response.

[24] I consider a country democratic if it has at least a Polity score of 6. The alternative measure of Cheibub, Gandhi and Vreeland (2010) does not lead to any different codings in this sample.

Identification of whether a group attack targets civilians or state security forces is quite straightforward as the TWEED data identify the intended target of the group's attack. I code an attack target as state security forces if the group targets either military or police forces.[25] Otherwise, I code an attack as targeting civilians. Identifying non-attacks is potentially difficult, as the TWEED data only identify attacks. I use information drawn from the TWEED data on the number of active violent groups in a country to generate observations in which no-attack was chosen by a group. I count a group as being active after it has carried out an attack.[26] I use the number of active groups to generate two types of non-attack observations. First, in country-years in which no attacks take place, each active group makes one non-attack decision. Second, in country-years in which attacks are observed, we generate a non-attack observation for each active group that does not carry out an attack. This generates 6073 non-attack observations.[27]

Three pieces of information are necessary to construct dependent variables that indicate government response to an attack. First, I need information on whether the government reacted directly to a given attack or not. Given the structure of interaction assumed in the model, it is essential not to treat government actions that are not directly related to a given attack as responses to that attack simply because the timing of the attack and response coincides. Importantly, the data distinguishes between general government reactions to attacks that are independent of an individual attack and government actions that are a direct and immediate response to a particular attack.[28] Second, a forceful response requires action by either the state's military, police, or secret services. Thus, I do

[25] A variable that includes attacks on other government officials or political institutions as attacks against the state performs similarly. This is not surprising as attacks on government military or police forces are much more common than on other government officials.

[26] If no attacks have taken place in a country, which is only true in Luxembourg, I assume that one prospective group decides each year to not attack.

[27] I also use several alternative criteria to generate non-attack observations. First, I tried using the number of attacks in the previous year as a baseline for the number of expected attacks in the current year. Thus, non-attack observations are generated when there is a decrease in the number of attacks from year to year. Second, I similarly assumed that deviations from prior attack levels implied non-attack decisions using two and three year averages of attacks. Thus, if the number of attacks in year $t$ decreases from the two or three year average by $n$ attacks, I assume that there are $n$ non-attack decisions in year $t$. Third, I used both the number of active groups and the number of attacks to generate the average number of attacks per group, per year. I used this information to generate an alternative set of non-attack observations. This third method is similar to that used in the main analysis. However, I assume that each group that does not attack in a given year generates $n$ non-attack observations, where $n$ is the average number of attacks per active group per country. All of these alternative methods generate results similar to those reported in the main results. Alternative methods that generate a greater number of observations generally decrease the standard errors but do not change the character of the results.

[28] As a robustness check, I also code more expansive forceful response variables that include immediate and general government responses that occur after an attack. The results are substantively similar and are available in the supplemental appendix. I focus here on immediate responses as they are fully consistent with the theoretical model.

not consider reactions from non-security departments such as the judiciary as forceful responses. Third, the data distinguish between "information reactions" (e.g., public pronouncements) and physical force. To ensure that the dependent variable does not include pronouncements as forceful responses, I exclude information reactions and only include responses that entail physical uses of force.

In the modal outcome, the group carries out an attack against civilians and the government does not respond forcefully. While guerilla attacks against state forces are less prevalent than terrorist attacks, forceful responses are much more common in response to guerilla attacks. Specifically, almost 10% of guerilla attacks result in a forceful government response, while only about 1% of terrorist attacks lead to a forceful government response. In short, despite widespread discussion of how governments overreact to terrorism with force (e.g., Richardson (2006)), forceful reactions to such attacks are relatively rare. Furthermore, the raw data suggest that governments are able to calibrate their response to the use of different tactics.

## Empirical Specification of Utilities

I now specify group and government utilities with regressors. The key is to specify the utilities with regressors that measure variables of importance to the theoretical model. However, I also am careful to specify the empirical model more generally to help guard against spurious results.[29] I first discuss the specification of the government's utilities and then discuss the group's utilities. The general specification of the group's utilities is depicted in figure 4.

### Specification of Government Utilities

I assess the severity of the group's attack with two measures of the number of casualties inflicted. The severity variables are measures of $c_t$ and $c_g$ in the theoretical model. First, as a measure of $c_t$ I include *Group-Caused Civilian Casualties*, which is the natural log of the number of civilians killed or injured by the group's attack.[30] Second, as a measure of $c_g$, I include *Group-Caused Govt Casualties*, which measures the logged number of government members killed or injured by

[29]Inclusion of any regressor in both players' utilities deals with endogeneity concerns about that variable that arise from strategic interaction between the group and government. See footnote 16 for a specific example.

[30]I take the natural log of all the casualty variables, as model comparison statistics suggest the logged variables are more appropriate. Additionally, the raw variables are highly right-skewed. However, the raw measures perform similarly in terms of the sign of the coefficients.

the group's attack.[31] When a group carries out a terrorist attack, the intended target is civilians, while government security forces are the intended target of a guerilla attack. However, some civilian casualties often also result from a guerilla attack. Thus, we include the measure of civilian casualties in the government's utilities for employing a forceful response to allow for the plausible possibility that civilian casualties also affect government response to guerilla attacks.[32] Inclusion of the severity variables in the government's utilities for forceful response also help account for political pressure on the government to respond, as some observers suggest that more casualties increase pressure on governments to act (e.g., Richardson (2006)).

To measure the damage that results from a forceful response by the government, it is essential to distinguish between damage inflicted on the group and collateral damage that negatively affects the civilian population. In the theoretical model, $\pi$ denotes the overall damage that results from a forceful government response, while $\alpha_i$ indicates the proportion of $\pi$ that targets group members. To account for the distinction between damage to the group and collateral damage to the civilian population, I include two variables, *State-Caused Group Damage*, which measures the level of damage inflicted on group members, or $\alpha_i\pi$, and *State-Caused Civilian Damage*, which measures the level of damage inflicted on the civilian population, or $(1 - \alpha_i)\pi$. Specifically, *State-Caused Group Damage* measures the number of group member deaths, injuries, and arrests that lead to convictions that result from the government's forceful response. Similarly, *State-Caused Civilian Damage* measures the number of civilian casualties, injuries, and arrests that do not lead to conviction that directly result from the government's forceful response. Forceful responses by the state that lead to civilian deaths and injuries are obviously harmful to the government. Wrongful arrests are also a harmful form of collateral damage to innocent civilians. Jamieson (1989) notes the

[31]Given the difficulty in generate the counter-factual level of group-caused severity for non-attack observations, I try three different ways to make sure that the results do not depend on how this is done. First, for non-attack observations, I assume the counterfactual is the severity of the group's last attack. Civilian casualties are produced from the last terrorist attack, while government casualties are produced from the last guerilla attack. This is the approach used to produce the results reported below. The appeal of this approach is that it mirrors the way government-caused damage is treated. Second, I assume the counterfactual is the average severity of the relevant tactic up until time $t$. Thus, for a non-attack observation in 1972, the severity of an attack (if it had occurred) is assumed to be the mean severity of the relevant type of attack prior to 1972. Again, civilian casualties are produced the mean severity of all prior terrorist attacks, and government casualties are produced from prior guerilla attacks. Finally, as a relatively stark test of whether the results are really dependent on how I code non-attacks, I code the severity of all non-attacks as 0. This is obviously an undesirable approach, as the counterfactual severity of all non-attacks is surely not 0. However, the main results regarding government accuracy are robust to this.

[32]I do not include *Group-Caused Govt Casualties* in the government's utility for an attack on civilians as government casualties are very rare in attacks on civilians.

role that wrongful arrests played in the Italian government's battle with left-wing terrorists. In response to an "unprecedented series of attacks" carried out by the Red Brigades (BR) in March 1978, "[u]nprepared and unable to identify the sources of spiralling violence, the forces of law and order reacted in an ad hoc, spasmodic fashion, making numerous arrests only to release suspects for lack of evidence (Jamieson, 1989, 99)." This response only served to make the government look incompetent and to add to the grievances of individuals that were plausible BR supporters (see Jamieson (1989) for an excellent treatment). Both variables are coded using information coded in the TWEED data on each forceful government response.[33]

There are two potential issues with the *State-Caused Group Damage* and *State-Caused Civilian Damage* that we discuss here. First, inclusion of the raw damage variables in group and government utilities suggests that both players precisely know the implications of a government response that has not yet occurred. However, it is more likely that both the government and group know the government's ability to effectively target group members in response to an attack via prior experience with forceful response. Accordingly, I measure both *State-Caused Group Damage* and *State-Caused Civilian Damage* using the damage that resulted from the government's prior forceful response to the given tactic. Thus, for each attack in the data, the damage from government response is measured as the damage from the prior event.[34] Second, since both variables are right-skewed, I include the natural log of both variables.[35]

The kind of group the government is engaged with also likely affects the propensity to respond with force. Specifically, is important to account for whether the group has territorial goals or not. Given that territorial groups contest a specific piece of land, they might be more attractive targets for forceful government response as their location is better known, e.g., Corsican separatists in France. If this is generally true, not including whether groups have territorial goals or not might lead to a spurious finding between accuracy and government response.[36] Accordingly, I code a variable that indicates whether a group has territorial goals or not, where groups that have irredentist or separatist goals are coded as territorial, and all other groups are not territorial.

[33]See Engene (2004) for details.

[34]This choice does not affect the results, as the results are similar if we use government caused damage from the current response.

[35]Again, the results are similar with the unlogged versions of these two variables. However, both AIC and BIC suggest that the logged variables are preferable.

[36]I thank an anonymous reviewer for pointing this possibility out.

The political costs of an attack to the government (and the pressure to respond) can also increase due to factors other than the severity of the attack itself. For instance, the costs of a particular attack are likely higher when the identity of the attacking group is known relative to when the group responsible for an attack is unknown. Attacks from unidentified groups are often assumed to be "one-hit wonders" or loner attacks, while attacks from known groups are evidence that the government has not been able to shut down an existing insurgent group. For 75% of the attacks in the data, the group is identified. Groups often self-identify when they explicitly take credit for an attack, or alternatively when their methods are well known enough to identify their attacks. Second, the ideological orientation of the government and relatedly the political orientation of its supporters, or winning coalition, should affect the costs of an attack and the political pressure to respond with force. Specifically, the extant literature suggests that the costs of attacks to right-wing governments are higher than for left-wing governments. Right-wing governments' winning coalitions are generally composed of individuals with more "hawkish" views that place higher value on crushing violent groups (Berrebi and Klor, 2006; Koch and Cranmer, 2007). Alternatively, Berrebi and Klor (2008) provide evidence that right-wing governments benefit electorally from terrorist violence that happens when left-wing governments are in power; thus, it is also plausible that leftist governments feel greater political pressure to forcibly respond. To measure the left-right orientation of the government and assess these possibilities, I use the measure developed by Kim and Fording (2002) and updated by Kim and Fording (2003). The Kim and Fording measure of ideology is continuous and takes into account both the ideology of the party (or parties) in power and the relative share of cabinet posts each party occupies. Kim and Fording measure party ideology by coding the content of party manifestos on a left-right scale. I scale the measure so that 0 indicates a fully left-leaning government and 1 indicates a fully right-leaning government. Thus, as the government ideology variable increases, the relevant government is increasingly right-wing.

We also include a measure of GDP per capita as a proxy specifically for a state's fiscal constraints and more generally for a state's capacity to respond to violent groups. Fearon and Laitin (2003) demonstrate that sub-state groups are much more likely to emerge as serious threats in relatively poor countries, arguing that this is because relatively wealthy countries are better able to combat groups.[37] Thus, I include the logged gross domestic product per capita in thousands of constant US

[37] Relatedly, Piazza (2008) shows that very low capacity states, i.e., failed states, are strongly associated with more

dollars to capture the idea that it is more costly for poor countries to deal with terrorist threats. The GDP per capita measure is from the most recent version of the data described in Gleditsch (2002). There is considerable variation, as the minimum GDP per capita is $3256, the maximum is $33,720, and the mean is $15,560. Finally, I also include the time since the government last responded forcefully to each tactic. If the government recently responded forcefully to an attack, this should make it less imperative to respond forcefully again, as there are likely decreasing marginal returns to the use of force against a group.[38] Furthermore, it is plausible that the public puts less political pressure on governments when there has recently been a forceful response.

**Specification of Group Utilities**

To measure the severity of either kind of attack, or $c_t$ and $c_g$, I include the same two measures of the severity of the group's attack that are also included in the government's utilities. First, I include *Group-Caused Civilian Casualties* in the group's utility for an attack on civilians that elicits a forceful response as well as in its utility for an attack on state forces that elicits a forceful response. Second, I include *Group-Caused Govt Casualties* in the group's utility for an attack against government forces that elicits a forceful response. Inclusion of these casualty variables builds on the idea that groups are able to systematically plan the severity of their attacks. Thus, I assume that groups are able to choose tactics and calibrate the severity of their attack.[39] Given that groups choose both the target and the mode of attack, i.e., firebomb, direct fire, et cetera, this seems reasonable.[40] Inclusion of group-caused casualties in the group's utilities also helps account for group strength, as stronger groups are better able to carry out more severe attacks.

A key component of the idea that tactical choice and attack severity are strategic is the idea that groups condition their strategy on the expected reaction of the government. As in government

terrorist attacks.

[38]This variable is calculated separately for responses to guerilla and terrorist attacks, although this is not indicated in the results table to simplify presentation.

[39]I also derived and estimated a model in which the group chooses the severity of an attack with error (in terms of damage to civilians and government security forces), and the government decides to respond forcefully or not. The results are consistent with those reported below estimating the more straightforward discrete choice model.

[40]In fact, examination of variation in casualties by mode of attack is consistent with this idea as the mean and variance within mode of attack are fairly close to each other for each mode of attack. For example, the mean number of government casualties for a direct armed attack against government forces is 0.797, with a variance of 0.796, while the mean number of civilian casualties that results from a direct armed attack against civilians is 0.638, with a variance of 0.636. The variance for a particular mode of attack is at most twice the mean for any mode of attack against a particular target type. The mode of attack with the highest dispersion is also incidentally the least common mode of attack, arson against civilian targets, with only 81 incidents out of over 9700 attacks ($\approx 0.008\%$).

utilities, I include the same two variables, *State-Caused Group Damage*, which measures the level of damage inflicted on group members, or $\alpha_i \pi$, and *State-Caused Civilian Damage*, which measures the level of damage inflicted on the civilian population, or $(1-\alpha_i)\pi$. I include both of these variables in the group's utility for attacking civilians and eliciting a forceful response and in its utility for attacking state forces and eliciting a forceful response.

I also include the variable that indicates whether the group has territorial goals or not in the group's utilities for attacking and receiving forceful response. I argue that anticipated government response is central to tactical choice. However, it is possible that whether a group has explicit territorial goals could be the driving factor, as guerilla attacks against government forces can facilitate taking control of contested land from the state. Inclusion of group goals helps us demonstrate that the accuracy of anticipated government response is not driven by heterogeneity in group goals, as suggested in the discussion of government utilities above. I include the *Territorial Goals* variable in the group's utility for carrying out a terrorist attack that receives forceful response, i.e., $U_G(Civ\ F)$, and in its utility for carrying out a guerilla attack that receives forceful response, i.e., $U_G(Gov\ F)$.

I employ several measures to capture the cost to the group for carrying out an attack. First, I include a variable that indicates whether the group that carried out the attack is publicly identified. Attacks for which the culprit is not identified are less severe and usually are less costly to carry out. Furthermore, not being identified is a choice, as it is relatively easy for a group to claim an attack. I include a variable indicating whether the attacking group is identified or not in the group's utilities for carrying out either a guerilla or terrorist attack and not experiencing a forceful response.[41] Additionally, groups that are unknown are typically thought to be much weaker than identified groups that often have carried out multiple attacks across time. Thus, *Unknown Group* group serves as a reasonable proxy for group strength.[42] Second, I include the left-right ideological orientation of the government in the group's utilities for employing a terrorist attack that elicits a forceful response and for employing a guerilla attack that results in a forceful response. Scholars argue that right-wing governments are more difficult to attack as they are willing to take measures to enhance security that left-leaning governments are not (e.g., Koch and Cranmer (2007)). I

[41] It does not matter whether we include variables in a utility for using a tactic, e.g., terrorism, that elicits a forceful response or does not elicit a forceful response. If we move *Unknown Group* from $U_G(Civ\ \neg F)$ to $U_G(Civ\ F)$, the sign will change but the effect on predicted probabilities will be the same.

[42] I discuss this more substantially below (and in the appendix) when I describe robustness tests.

measure left-right orientation using the data developed by Kim and Fording (2002) exactly as described above. Finally, I also include the time since the government last forcefully responded to a given tactic.

## Results

Before I discuss the estimates of the statistical model, I briefly discuss and show some patterns in the raw data to probe the plausibility of the theoretical expectations relative to provocation. Governments are much more likely to respond to guerilla attacks with force than terrorist attacks, as 10% of guerilla attacks elicit forceful response while only 1% of terrorist attacks elicit forceful response. The theory developed above suggests that variation in how precisely governments can respond explains these differences. Specifically, the logic behind Expectation 2b suggests that governments are more precise following guerilla attacks than following terrorist attacks. The raw data are consistent with this logic, as the mean proportion of damage the state imposes on groups following guerilla attacks is 53%, while the mean proportion of damage the state is able to impose on groups in response to terrorist attacks is only 22%.[43] This suggests that governments are not often provoked into forcefully responding to terrorist attacks because their responses tend to mostly harm civilians.

The graphs in figure 6 further probe the relationship between guerilla attacks, forceful government response, and collateral damage. I focus on the five countries that experience the most violence in the data: United Kingdom, Germany, Spain, Italy, and France. The graphs for each country show 1.) the proportion of attacks that target government security forces across time (the solid black lines) and 2.) the proportion of attacks that receive a damaging forceful government response (the dotted black lines).[44] Given what the raw data suggests thus far, we expect to see the two lines track each other across time. In other words, we expect more guerilla attacks to be accompanied by more government responses that result in some collateral damage. In four out of the five high violence cases, this is true. In fact, for the UK, Germany, Spain, and Italy, the spikes

[43] Furthermore, there are not stark differences across the two tactics in other key variables such as the average severity of terrorist versus guerilla attacks. The average total number of deaths and injuries from guerilla attacks is 1.23, while the average for terrorist attacks is 1.28, a substantively small and statistically insignificant difference.

[44] To make the small graphs more readable, I focus on the relatively intense decades of conflict for each case. The patterns in no way depend on not showing time periods that are relatively "dormant".

in guerilla attacks across time coincide with damaging government responses to a remarkable degree. France is the only exception to the pattern, as it rarely responds forcefully to attacks despite a number of years in which guerilla attacks are prominent.[45] These results suggest at least two things. First, groups are targeting security forces when the government is responding forcefully to attacks and imposing some civilian damage. Second, the pattern is consistent with all but one of the five high violence cases. These results rely on raw data, so we further explore patterns data below with the statistical version of our theoretical model that also controls for other plausible confounding factors.

The estimated utilities for the violent group and targeted government are shown in table 2. Each column contains the estimates for either the group's utility for an outcome (i.e., columns 1–4) or the government's utility for an outcome (i.e., columns 5–6). For example, the first column shows how the regressors affect the group's utility for carrying out an attack against civilians that does not result in a forceful response from the state, or $U_G(Civ\ \neg F)$. In what follows, I first discuss the results for the government and then move on to discuss the group's utilities. Throughout the discussion I refer to predicted probabilities and graphical depictions of the results, as the graphs are more straightforward to interpret than raw coefficients.

### Government Decision to Respond with Force

The theory suggests that a government's decision to respond to an attack with force or not depends crucially on its accuracy. I argue that despite the potential downside to forceful response, governments make a sensible calculation in responding to violence. This view contrasts with much writing on government response to political violence, which often emphasizes overreaction (e.g., Pillar (2001) or Richardson (2006)). The results corroborate the theory, as I find that the probability of forceful response increases in government accuracy and that government response to different tactics is quite nuanced. On the latter point, I find that the number of civilian casualties has a positive and significant influence on the probability the government forcefully responds to an attack on civilians. The opposite holds for the probability the government responds forcefully to an attack

[45] Removal of France from the sample has no effect on the key results.

on government forces. This suggests that governments carefully calibrate their response to the tactical choice of groups. Furthermore, this is evidence that the sixteen governments analyzed here do not simply respond with force to civilian casualties as a knee-jerk reaction to public pressure. Rather, governments condition their assessment of how severe an attack is by the tactic employed.

The graph in figure 6(a) clearly shows that governments are more likely to respond with force when they are better able to target group members, which provides support for expectation 1. The solid black line depicts the probability of a forceful response to an attack on civilians, while the dotted line depicts the probability of a forceful response to an attack on government forces. Both probabilities increase considerably as the number of group members killed, injured, or ultimately convicted increases as a proportion of the overall level of damage, i.e., $\pi$ in the theoretical model. Thus, regardless of tactic, government behavior exhibits the expected relationship between $\alpha_i$ and the probability of a forceful response. We turn next to explore which tactic is more likely to provoke a government response.

The raw data analyzed above suggests support for the idea that the government is more effective at using force to target group members in response to a guerilla attack, meaning that expectation 2b finds support. The graph in figure 6(a) corroborates this. The graph shows that the probability of a forceful government response following a guerilla attack is uniformly higher than the probability following a terrorist attack. Moreover, the probability of a forceful response to a guerilla attack increases more quickly in the proportion of damage directed towards group members than the probability of a forceful response to a terrorist attack. In fact, the government's propensity to respond forcefully to a guerilla attack increases as the percentage of damage that targets group members increases above 35–40% and rapidly increases after 50% of the damage from the government's crackdown effectively targets group members. In contrast, the probability of a forceful response to a terrorist attack does not start to increase until around 70% of the damage targets group members, which is not common in the data. In sum, the results strongly suggest two things. First, the results suggest that the logic of the theoretical model is empirically sound as expectation 1 finds strong support regardless of tactic. Second, the results provide support for expectation 2b, as governments are uniformly more likely to respond to guerilla attacks with force. Of course, an analysis of group behavior is necessary to obtain a full picture.

The graph in figure 6(b) shows the relationship between attack severity in terms of civilian casualties and government response. The y-axis depicts the estimated probability the government chooses a forceful response following an attack that targets civilians, while the x-axis varies the number of civilians killed and injured by the group's attack. The solid black line shows the probability of a forceful response when the group's identity is known, while the dotted line shows the probability for an unidentified group. The black line shows that governments are increasingly likely to forcefully respond to an identified group's attack on civilians as the severity of the attack increases. The probability of a forceful response increases markedly as the casualties inflicted increase. Specifically, an attack that claims 27 victims (i.e., $\approx 3.30$ on the x-axis) is around 350% more likely to garner a forceful response than an attack with 1 victim.[46] The dotted line shows a much weaker relationship between government response and the number of civilians killed by an attack by an unknown group. This makes sense, as employing a forceful response with any precision is difficult when it is highly uncertain who the perpetrators are. Figure 6(c) demonstrates that governments are also significantly less likely to respond with force to attacks against their own forces when the perpetrators are unknown.

A state's response to attacks that target its security forces is closely tied to government ideology. As governments become more right-wing in their overall composition, the probability they respond with force to attacks on their security forces increases considerably. When 47% of cabinet positions are occupied by right-wing party-members, which is the sample mean, the probability of a forceful government response to an attack on security forces is about 0.04. When the government is 65% right-wing, which is one standard deviation increase, the probability of a forceful response increases by over 75%. If the government is around 28% right-wing, which is one standard deviation decrease, the probability decreases by around 75%. Figure 6(c) shows the relationship when the attacking group's identity is known and when it is not. When the group's identity is known, figure 6(c) shows that as we examine increasingly right-wing governments, the propensity to employ a forceful response increases. However, the same relationship is not present when the group is unknown.

Governments are more likely to respond with force to groups with territorial goals when they use guerilla tactics, but not when they use terrorism. This is intuitive, as attacks against government security forces are likely more threatening when the group seeks to take control of territory from the

[46]The maximum number of casualties is 288.

state. In contrast, territorial goals do not matter for government response to terrorist attacks. The level of economic wealth measured by GDP per capita is not a significant predictor of government response to terrorist attacks. However, wealthier states are less likely to respond to guerrilla attacks with force. This finding is in some contrast with existing work, as scholars have typically argued that countries with higher levels of GDP per capita have higher levels of capacity to deal with internal threats (e.g., Fearon and Laitin (2003)). However, it is possible that the groups which employ guerilla attacks in wealthier states are a less serious threat, which could be consistent with Fearon and Laitin (2003). Finally, I find that the number of years since the state employed a forceful response to an attack on its security forces is negatively related to its propensity to employ such a response currently. This is consistent with the interpretation that a government pays a lower cost for refraining from a forceful response if it has recently responded with force to a guerilla attack. However, the number of years since a state employed a forceful response to an attack on civilians does not significantly influence the propensity to respond currently.

### Group Tactical Choice and Provocation

The results for government utilities clearly suggest that states respond quite differently to the use of different tactics. The raw data examined in discussion of government behavior is consistent with the idea that groups use guerilla tactics to provoke. For example, the plots for four of the five high-violence countries in figure 6 show that guerilla attacks closely track damaging government responses. Consistent with the raw data, the results for group utilities suggest that tactical choice is strongly influenced by the expected government response. Furthermore, the results suggest that violent groups can benefit from a harsh government response and that the provocation dynamic is more relevant to guerilla attacks than to attacks against civilians. Together with the results for the government's utilities, these results complete a coherent and theoretically consistent empirical picture. In what follows, I rely solely on graphs and predicted probabilities to interpret the results for the group's utilities, as the coefficients themselves are not easy to interpret.[47]

[47] For example, we observe a positive coefficient for *State-Caused Group Casualties* on $U_G(Gov\ F)$ in table 2. However, examination of figure 7(a) shows that the effect is non-monotonic. The effect of *State-Caused Group Casualties* is positive at its mean value, as it initially increases the probability of a guerilla attack slightly from *State-Caused Group Casualties*=0 to around *State-Caused Group Casualties*=0.8. However, its effect on the probability of a guerilla attack subsequently becomes negative and much more substantively significant. In short, interpreting the raw coefficient in table 2 leads us to misinterpret the effect of *State-Caused Group Casualties* on the group's tactical choice.

The results suggest that terrorist attacks are not generally intended to provoke the government, while guerilla attacks are more often part of a provocation strategy. The two graphs in figure 7 show the effect of damage to civilians and damage to group members caused by the state's prior forceful response on the probability the group carries out a guerilla attack. The two graphs depict the same relationship from two different angles. The two horizontal axis vary the number of civilians adversely affected by government response and the number of group members adversely affected by government response, while the vertical-axis shows the probability of a guerilla attack. Focusing first on state-caused civilian casualties, the graph clearly shows that groups are increasingly likely to target state security forces as they face governments whose crackdowns damage civilians. Together with the finding that governments are more likely to respond to guerilla attacks with force, i.e., support for Expectation 2b, these findings suggest that guerilla tactics are used as part of a provocation strategy, i.e., Expectation 3b finds support.

The graphs in figure 7 suggest that groups quite effectively navigate the positive and negative implications of forceful government response. Furthermore, the graphs provide striking support for Expectation 3b. Both graphs show how the probability of a guerilla attack changes as both state caused civilian damage and state caused group damage increase. Strikingly, the graphs show that the strong positive effect of state-caused civilian collateral damage on the group's propensity to carry out a guerilla attack is highly conditional on state-caused group damage. At low and moderate levels of expected group damage, figure 7(b) shows that as expected civilian damage increases the probability of a guerilla attack also sharply increases. Specifically, increasing expected civilian damage significantly increases the probability of a guerilla attack until the expected number of group casualties is about 3, which corresponds to slightly more than 1 in the graph (which depicts the log number of individuals). However, after the level of group damage increases above this point, the probability of a guerilla attack plummets. This provides striking evidence in favor of Expectation 3b, as the cut-point for group damage is clear in figure 7. Figure 7(a) nicely depicts the sharp drop-off in probability when a significant number of group casualties are expected. The decrease in probability is especially marked when expected civilian casualties are relatively high, e.g., greater than 3. In fact, when the government's forceful response results in a loss of more than a few members of the group, the probability it provocatively attacks government forces is close to 0. This is true regardless of the prior level of civilian collateral damage caused by forceful government response.

The two graphs generated from the empirical model depicted in figure 7 are strikingly similar to the graphs generated from the theoretical model and depicted in figure 3. The theoretical graphs show that, when the provocative tactic results in a government response that inflicts increasing levels of damage to the group, higher levels of civilian collateral damage are necessary for provocation to be an optimal strategy. Furthermore, there is a threshold after which damage to the group is too high for any level of civilian collateral damage to make provocation optimal. This relationship is the basis of expectations 3a and 3b. The empirical graphs in figure 7 show the same basic relationship.[48]

In sum, the results for the group's utilities provide unique and nuanced evidence of how groups plan attacks in anticipation of government response. The results do not provide much evidence that groups use terrorist tactics to provoke counterproductive government responses. However, there is compelling evidence that guerilla tactics are associated with a strategy of provocation. First, basic patterns in the data suggest that guerilla tactics are more likely to provoke the government. Furthermore, as the prior government response is associated with higher levels of civilian collateral damage, groups are increasingly likely to employ guerilla tactics. The increase in the probability of a guerilla attack for a known group shown in figure 7 is striking. However, groups are also very sensitive to losing any of their own members as a result of a government crackdown. Thus, the prospect of provoking a government to generate civilian collateral damage quickly loses its appeal to groups as they themselves face the prospect of serious casualties. All in all, these results provide support for Expectation 3b, which together with the support for Expectation 2b in the government's utilities provides a coherent overall picture of how group attacks relate to government response and a strategy of provocation.

Finally, I discuss the group's preferences over attack severity for terrorist and guerilla tactics. Groups favor attacks that cause a higher number of civilian casualties when the government responds forcefully. This is true of both attacks on civilians and attacks on government forces. Although civilians are not explicitly targeted when the group attacks state security forces, civilian casualties occur. Military and especially police units can be posted in close proximity to civilians,

[48] A difference is that the graphs depict probabilistic rather than deterministic relationships. However, this is inconsequential for the basic shape of the relationships. If we add error to the theoretical model, the graph would show a "smoother" probabilistic version of the same relationship.

which makes civilian casualties common. The number of government casualties that result from a provocative attack against state forces also has positive influence on the group's utility. The number of government casualties caused by the attack is not included in the group's utility for targeting civilians, as government casualties quite rarely result from terrorist attacks. These results are consistent with the theoretical model, as groups receive higher utility for attacks of greater severity, i.e., $c_i$ is higher.

### Robustness Tests

The results of the strategic attacks model are robust to exploration of numerous potential objections. I highlight several of the more important robustness checks here, although the details and results of all robustness checks are contained in the supplemental appendix. First, the idea that direct attacks drive the finding that guerilla attacks are more provocative than terrorist attacks is potentially troublesome. The potential objection is that guerilla attacks are much more likely than terrorist attacks to involve direct attacks in which group members are physically present at the time of the attack, e.g. attacks via direct fire, rocket attacks, or grenade attacks. Second, it is possible that the set of groups that carry out guerilla attacks is distinct from the set of groups that carry out terrorist attacks. If this is the case, modeling the strategic choice between the two tactics would not make much sense. However, over 30% of groups in the sample employ both guerilla and terrorist tactics. Over 65% of groups in the sample exclusively employ terrorist attacks, while only about 6% of groups exclusively employ guerilla attacks against state security forces. In sum, given that almost a third of groups use a mix of tactics, analysis of a *choice* between terrorist and guerilla tactics for groups is merited. Furthermore, the finding that only 6% of groups exclusively use guerilla tactics suggests that the study of guerilla and insurgent groups in isolation is problematic. Third and relatedly, it is possible that tactical choice is very dependent upon group strength in a manner not captured in the main empirical model. Fourth, I address the possibility that the logic of the model does not apply to (very few) groups involved in negotiations with the government. Finally, I estimate several alternative model specifications, including a linear probability model with country fixed effects, to ensure that the results are not too dependent on the specification reported in table 2. The key results survive all of these robustness checks, which are outlined in detail in the appendix.

### Are Attacks Strategic? A Comparison of Models

The results in table 2 provide consistent and compelling evidence that groups strategically choose tactics in a manner that anticipates government response. However, is it really appropriate to assume that terrorist groups plan attacks strategically? While policy-makers and the bulk of scholars argue that groups are strategic, so far I have not directly tested the assumption that attacks are strategic. The obvious way to do this is to use comparative model testing methods to compare the strategic model in table 2 to a non-strategic model of attack severity (Clarke, 2001).

In our case, we can rely on a simple likelihood ratio test, which is a well-known and easy to implement test appropriate for nested models. The model of the group's choice of tactic in table 2 assumes that the group conditions its choice on how it expects the government to react. However, if the group makes a non-strategic decision we do not need to condition its choice on the expected response of the government. Rather, we can just include all of the same substantive regressors included in the group's utilities without conditioning their influence on the probability of response or the probability of non-response respectively. This simpler model is nested within the strategic estimator as it is technically the same model with the assumption that the probabilities are constants, e.g., equal to 1. As Clarke (2001, 727–728) notes, two models are nested if the "unrestricted" model can be reduced to the "restricted" model by imposing a set of linear restrictions. The restriction here states that the probability the government responds forcefully is irrelevant to the group's choice of severity. Comparison of the log-likelihoods for the two models suggest that the strategic model of tactical choice is vastly better. The likelihood ratio statistic is far above any statistical threshold with 18 degrees of freedom (for the 18 additional parameters in the strategic model). This indicates that the strategic model of attack severity is easily better than the non-strategic version.

As an additional test, I compare the predictive power of the strategic model of tactical choice and its non-strategic equivalent. The strategic model correctly predicts 84% of group decisions, which is essentially the same as the performance of the full model shown in table 2.[49] In contrast, the non-strategic model of groups' tactical choice only correctly predicts 62% of observations.

[49] The percentage of observations correctly predicted shown in table 2 requires that the correct prediction be made for the groups' tactical choice, governments' decisions to employ a forceful response following a terrorist attack, and governments' decisions to employ a forceful response following a guerilla attack.

This indicates that allowing for the fact that groups anticipate government response improves the predictive power of the model by over 35%. In sum, the strategic model of tactical choice clearly outperforms the simpler non-strategic model.

## Conclusion

The idea that violent sub-state groups plan their attacks in anticipation of government responses is ubiquitous among scholars and policy-makers. For example, in a description of Basque Homeland and Freedom (ETA) strategy, Zirakzadeh (2002, 73) notes that group members "reasoned that selective attacks against government bullies would provoke the government into excessive and nondiscriminatory retaliation against all Basque residents." ETA leaders further reasoned that "droves of residents, angered by the states random violence, would demonstrate tumultuously (Zirakzadeh, 2002, 73)." Of course, states also recognize that groups are strategic in their use of violence. The preface of the United States government's initial National Strategy for Homeland Security bluntly states that "[o]ne fact dominates all homeland security threat assessments: terrorists are strategic actors (Department of Homeland Security, 2002, vii)." Despite the importance of the strategic interactions between groups and governments in determining groups' tactical choice and governments' response to the groups, existing literature on violence has not provided us with empirical evidence that groups strategically plan attacks.

This is the first paper to provide broad and direct empirical evidence that groups strategically plan attacks in anticipation of government response. The analysis in this paper is conducted using data on over five decades of violent attacks and government responses to these attacks in Western European democracies. Western Europe is an ideal region to study how group strategy relates to provocation or avoidance of forceful government response. First, this region of the world experienced a significant amount of sub-state violence relative to other regions. Chalk (1993) notes that Western Europe experienced more violence between the 1960s-1980s than any other region. Comparison of the volume of incidents coded by the Global Terrorism Database (GTD) in Western Europe relative to incidents in the Middle East and North Africa from 1970 to the present corroborates that Europe experienced more violence up until the 1990s (START, 2012). Second, Western European governments are overwhelmingly democratic, which is an advantage given extant theory which suggests that provocation is most plausible in democracies (Kydd and Walter, 2006). Finally, the groups in Western Europe are predominantly urban groups that face significant disadvantages relative to high capacity governments, which makes the findings especially striking. In sum, Western Europe is a good region to study the interactions between groups' choice of tactics and governments' responses.

The evidence presented in this paper show that groups strategically use guerilla attacks to provoke a forceful response, while the use of terrorist attacks are associated with groups' strategy to avoid a forceful response. I uncover striking evidence that violent groups choose tactics in a way that quite effectively anticipates how precise a potential forceful government response will be in targeting group members. When anticipated damage to group members from a forceful government response is relatively low, groups are increasingly likely to choose provocative guerilla attacks as the anticipated collateral civilian damage imposed by government forces increases. However, after the group anticipates losing a significant number of members, the propensity to carry out provocative attacks disappears. The findings of this paper suggest the need for further empirical work on the strategic decisions of violent non-state groups. Furthermore, the finding that groups' choice to target government security forces or civilians is strategic suggests that it is problematic to study terrorist attacks or guerilla attacks in isolation, marshaling empirical evidence for a theoretical point made by Bueno de Mesquita (Forthcoming). This is a significant concern, as much work in terrorism and civil war literatures seeks to explain why some countries experience more violence than others. Given that groups strategically substitute terrorist and guerilla attacks, it is important to account for groups' tactical choices to understand why some countries might experience more terrorist attacks, but have a significantly fewer guerilla attacks, or vice versa. Thus, strategies that policy-makers might develop to reduce the attractiveness of guerilla violence might have the unintended effect of producing more terrorist violence, and vice versa.

## References


Bapat, Navin A. 2007. "The Internationalization of Terrorist Campaigns." *Conflict Management and Peace Science* 24(4):265–280.

Bas, Muhammet Ali, Curtis S. Signorino and Robert W. Walker. 2007. "Statistical Backwards Induction: A Simple Method for Estimating Recursive Strategic Models." *Political Analysis* 16:21–41.

Benmelech, Efraim, Claude Berrebi and Esteban F. Klor. 2010. "Counter-Suicide Terrorism: Evidence from House Demolitions." *NBER Working Paper Series* Working Paper No. 16493.

Berrebi, Claude and Esteban F. Klor. 2006. "On Terrorism and Electoral Outcomes: Theory and Evidence from the Israeli-Palestinian Conflict." *Journal of Conflict Resolution* 50(6):899–925.

Berrebi, Claude and Esteban F. Klor. 2008. "Are Voters Sensitive to Terrorism? Direct Evidence from the Israeli Electorate." *American Political Science Review* 102(3):279–301.

Bloom, Mia. 2005. *Dying to Kill: The Allure of Suicide Terror*. New York, NY: Columbia University Press.

Bueno de Mesquita, Ethan. 2005*a*. "Conciliation, Counterterrorism, and Patterns of Terrorist Violence." *International Organization* 59:145–176.

Bueno de Mesquita, Ethan. 2005*b*. "The Quality of Terror." *American Journal of Political Science* 49(3):515–530.

Bueno de Mesquita, Ethan. 2007. "Politics and the Suboptimal Provision of Counterterror." *International Organization* 61(1):9–36.

Bueno de Mesquita, Ethan. Forthcoming. "Rebel Tactics." *Journal of Political Economy* .

Byman, Daniel. 2005. *Deadly Connections: States that Sponsor Terrorism*. Cambridge, UK: Cambridge University Press.

Carrubba, Clifford J., Amy Yuen and Christopher Zorn. 2007. "In Defense of Comparative Statics: Specifying Empirical Tests of Models of Strategic Interaction." *Political Analysis* 15(4):465–482.

Chalk, Peter. 1993. *West European terrorism and counter-terrorism: The evolving dynamic*. New York, NY: St. Martin's Press.

Cheibub, José Antonio, Jennifer Gandhi and James Raymond Vreeland. 2010. "Democracy and Dictatorship Revisited." *Public Choice* 143(1-2):67–101.

Clarke, Kevin. 2001. "Testing Nonnested Models of International Relations: Reevaluating Realism." *The American Journal of Political Science* 45(3):724–744.

Crenshaw, Martha. 1981. "The Causes of Terrorism." *Comparative Politics* 13(4):379–399.

Della Porta, Donatella. 1995. *Social Movements, Political Violence, and the State: A Comparative Analysis of Italy and Germany*. Cambridge, UK: Cambridge University Press.

Dragu, Tiberiu. 2011. "Is There a Trade-off between Security and Liberty? Executive Bias, Privacy Protections, and Terrorism Prevention." *American Political Science Review* 105(1):64–78.

Engene, Jan Osker. 2004. *Terrorism in Western Europe: Explaining the Trends Since 1950*. Cheltenham, UK: Edward Elgar.

English, Richard. 2003. *Armed Struggle: The History of the IRA*. London, UK: Macmillan.

Fearon, James. 1995. "Rationalist Explanations for War." *International Organization* 49:379–414.

Fearon, James D. and David D. Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *The American Political Science Review* 97(1):75–90.

Gleditsch, Kristian Skrede. 2002. "Expanded Trade and GDP Data." *Journal of Conflict Resolution* 46(5):712–724.

Goldstein, Robert J. 1983. *Political Repression in 19th Century Europe*. Beckenham, UK: Croom Helm.

Hoffman, Bruce. 2006. *Inside Terrorism: Revised and Expanded Edition*. New York, NY: Columbia University Press.

Jaeger, David A., Esteban F. Klor, Sami H. Miaari and M. Daniele Paserman. 2012. "The Struggle for Palestinian Hearts and Minds: Violence and Public Opinion in the Second Intifada." *Journal of Public Economics* 96:354–368.

Jamieson, Alison. 1989. *The Heart Attacked: Terrorism and Conflict in the Italian State*. London, UK: Marion Boyars.

Kim, Heemin and Richard C. Fording. 2002. "Government partisanship in Western democracies, 1945–1998." *European Journal of Political Research* 41(2):187–206.

Kim, Heemin and Richard C. Fording. 2003. "Voter ideology in Western democracies: An Update." *European Journal of Political Research* 42(1):95–105.

Koch, Michael T. and Skyler Cranmer. 2007. "Testing the "Dick Cheney" Hypothesis: Do Governments of the Left Attract More Terrorism than Governments of the Right?" *Conflict Management and Peace Science* 24(4):311–326.

Kydd, Andrew and Barbara Walter. 2006. "The Strategies of Terrorism." *International Security* 31(1):49–80.

Lake, David A. 2002. "Rational Extremism: Understanding Terrorism in the Twenty-first Century." *International Organization* Dialog-IO:15–29.

Laqueur, Walter. 1987. *The Age of Terrorism*. Boston, MA: Little Brown.

Li, Quan. 2005. "Does Democracy Promote or Reduce Transnational Terrorist Incidents?" *Journal of Conflict Resolution* 49(2):278–297.

Marighella, Carlos. 1971. "Minimanual of the Urban Guerilla." *Survival: Global Politics and Strategy* 13(3):95–100.

Mas-Colell, Andreu, Michael Whinston and Jerry Green. 1995. *Microeconomic Theory*. New York City, NY: Oxford University Press, USA.

McAdam, Doug. 1982. *Political Process and the Development of Black Insurgency, 1930–1970*. Chicago, IL: University of Chicago Press.

Merari, Ariel. 1993. "Terrorism as a Strategy of Insurgency." *Terrorism and Political Violence* 5(4):213–251.

Moncourt, Andre and J. Smith, eds. 2009. *The Red Army Faction: A Documentary History, Volume I.* Oakland, CA: PM Press.

Nalbandian, Louise. 1963. *Armenian Revolutionary Movement: The Development of Armenian Political Parties Through the Nineteenth Century.* Berkeley, CA: University of California Press.

Pape, Robert A. 2003. "The Strategic Logic of Suicide Terrorism." *American Political Science Review* 97(3):343–361.

Piazza, James. 2008. "Incubators of Terror: Do Failed and Failing States Promote Transnational Terrorism?" *International Studies Quarterly* 52(3):469–488.

Pillar, Paul R. 2001. *Terrorism and U.S. Foreign Policy.* Washington, D.C.: Brookings Institution Press.

Richardson, Louise. 2006. *What Terrorists Want: Understanding the Enemy, Containing the Threat.* New York, NY: Random House.

Rosendorff, B. Peter and Todd Sandler. 2004. "Too Much of a Good Thing? The Proactive Response Dilemma." *Journal of Conflict Resolution* 48(5):657–671.

Sandler, Todd, John T. Tschirhart and Jon Couley. 1983. "A Theoretical Analysis of Transactional Terrorism." *American Political Science Review* 77(4):36–56.

Schultz, Kenneth A. 2010. "War as an Enforcement Problem: Interstate Conflict over Rebel Support in Civil Wars." *International Organization* 64(2):281–312.

Signorino, Curtis S. 1999. "Strategic Interaction and the Statistical Analysis of International Conflict." *American Political Science Review* 93(2):279–297.

Signorino, Curtis S. 2003. "Structure and Uncertainty in Discrete Choice Models." *Political Analysis* 11(4):316–344.

Signorino, Curtis S. and Kuzey Yilmaz. 2003. "Strategic Misspecification in Regression Models." *American Journal of Political Science* 47(3):551–566.

Simon, Herbert. 1997. *Administrative Behavior, 4th edition.* New York, NY: Free Press.

START. 2012. "Global Terrorism Database.". http://www.start.umd.edu/gtd/,.

Valentino, Benjamin A. 2005. *Final solutions: Mass Killing and Genocide in the 20th Century.* Ithaca, NY: Cornell University Press.

Zirakzadeh, Cyrus Ernesto. 2002. "From Revolutionary Dreams to Organizational Fragmentation: Disputes over Violence within ETA and Sendero Luminoso." *Terrorism and Political Violence* 14(4):66–92.

Table 1: Summary of Results

| **State Action Given Attack** | | | **Group Action Given State Response** | |
|---|---|---|---|---|
| Always Employ Forceful Response | $\alpha_i, \alpha_j > \frac{1}{2}$ | $\Longrightarrow$ | Attack with Tactic $i$ if | $\alpha_i < min\left\{\frac{1}{2} + \frac{c_i - k_i}{2\pi},\ \alpha_j + \frac{(c_i-k_i)-(c_j-k_j)}{2\pi}\right\}$ |
| Employ Forceful Response Conditional on Tactic $i$ | $\alpha_i > \frac{1}{2} > \alpha_j$ | $\Longrightarrow$ | Attack to Provoke if | $\alpha_i < min\left\{\frac{1}{2} + \frac{c_i - k_i}{2\pi},\ \frac{1}{2} + \frac{(c_i-k_i)-(c_j-k_j)}{2\pi}\right\}$ |
| Never Employ Forceful Response | $\frac{1}{2} > \alpha_i, \alpha_j$ | $\Longrightarrow$ | Attack with Tactic $i$ if | $c_i - k_i > max\{0,\ c_j - k_j\}$ |

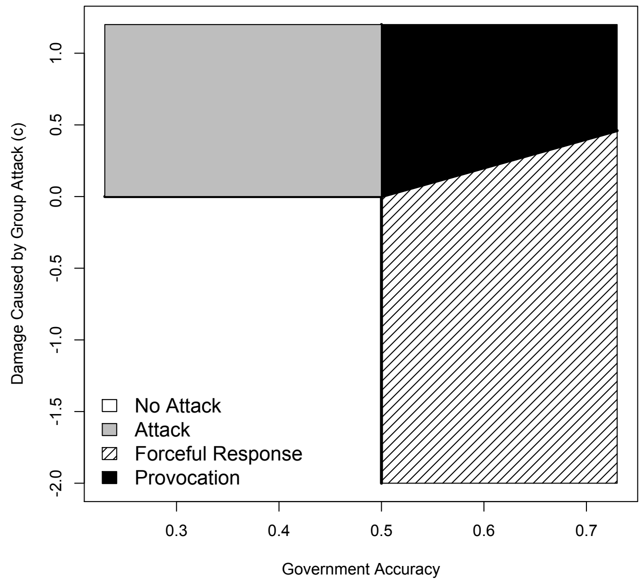
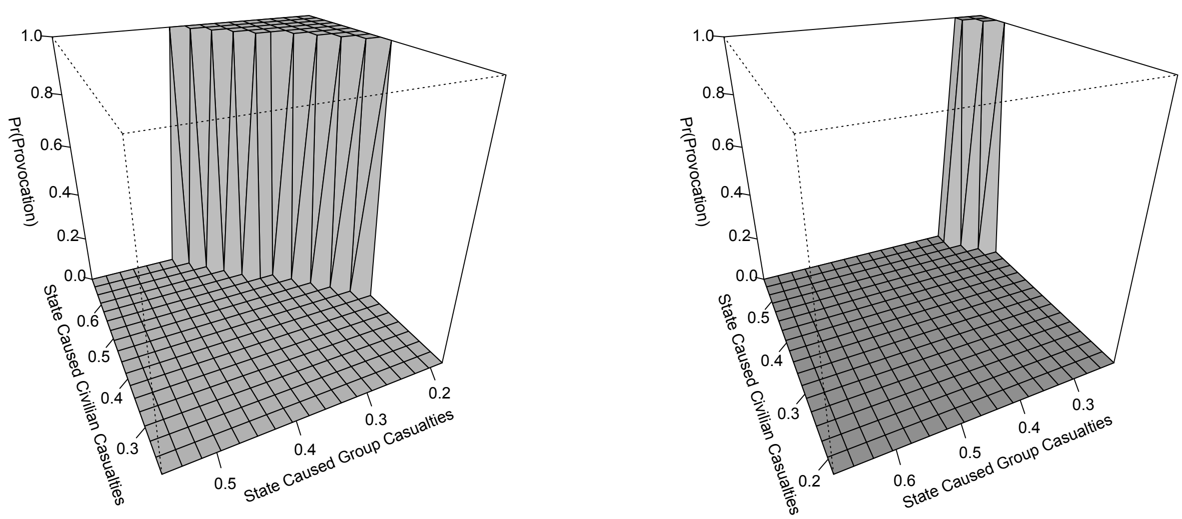



Figure 2: Government Accuracy, Group Attack Payoffs, and Provocation

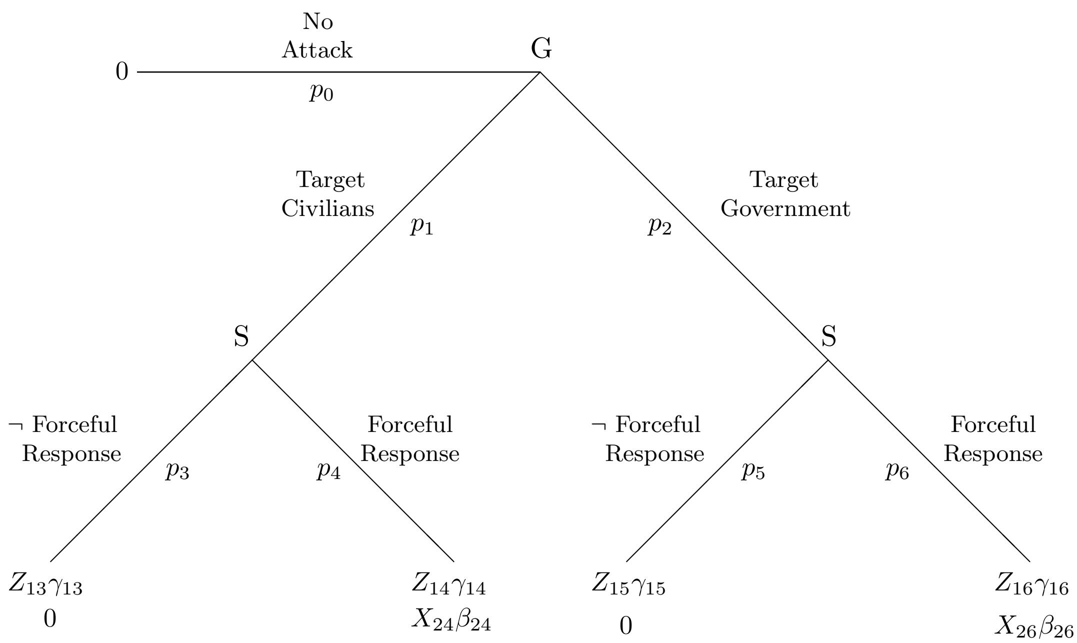


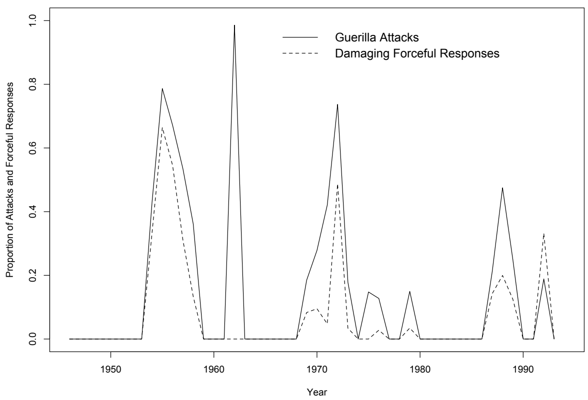

(a) $\alpha = 0.52$

(b) $\alpha = 0.60$

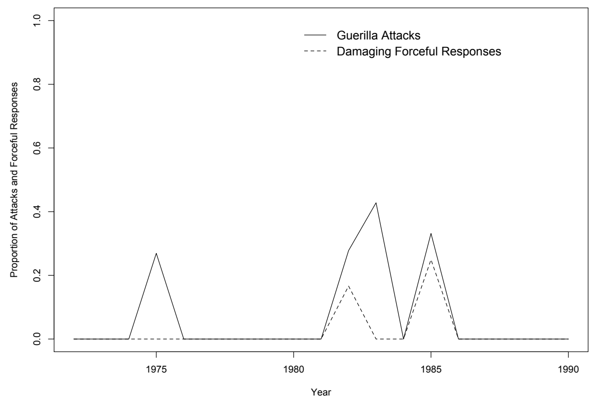
Figure 3: Provocation and Government-Caused Damage

Figure 4: The Strategic Attacks Game

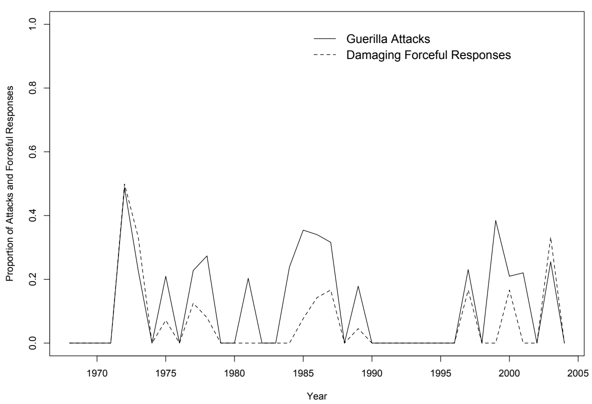




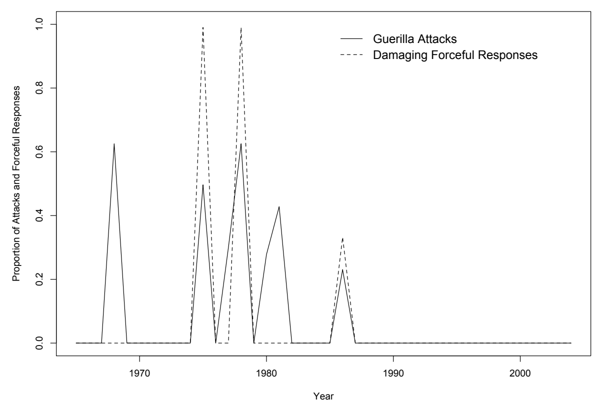

(a) United Kingdom



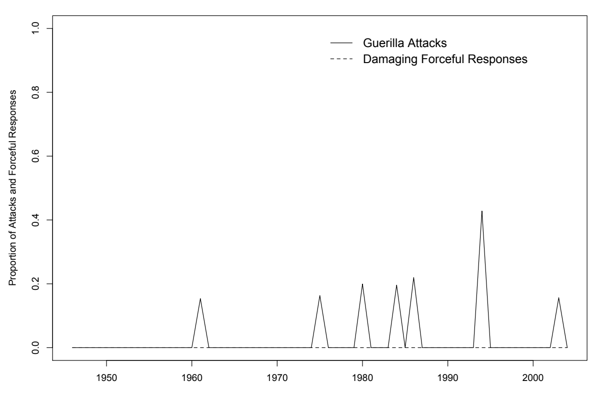

(b) Germany




(c) Spain




(d) Italy



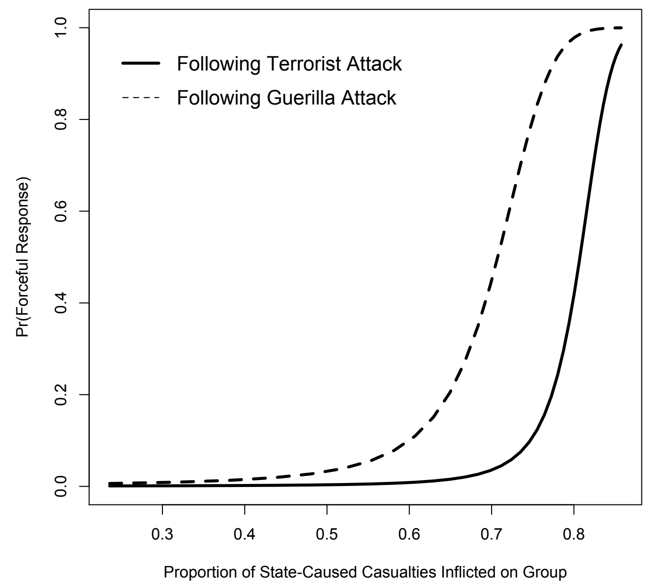

(e) France

Figure 5: Guerilla Attacks and Damaging Forceful Response: Raw Data

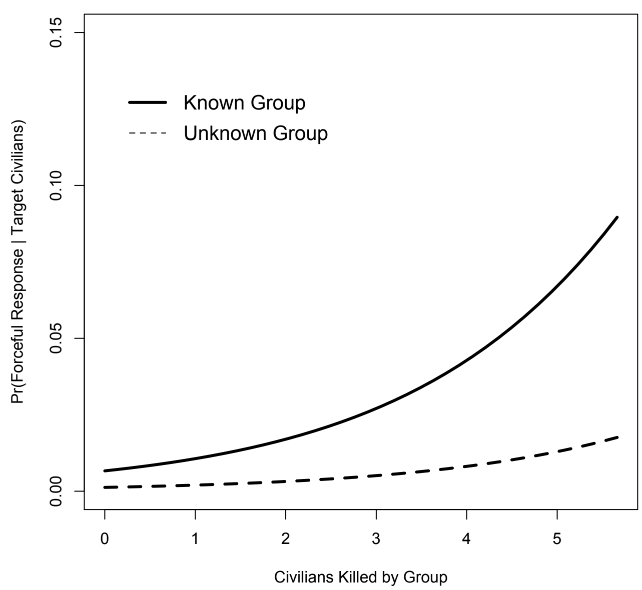
Table 2: Results for Strategic Attacks Game

| | $U_G(Civ \neg F)$ | $U_G(Civ\ F)$ | $U_G(Gov \neg F)$ | $U_G(Gov\ F)$ | $U_S(Civ\ F)$ | $U_S(Gov\ F)$ |
|---|---|---|---|---|---|---|
| Constant | 3.30** | | 1.44** | | -0.75 | 18.16** |
| | (0.06) | | (0.06) | | (6.83) | (6.55) |
| Unknown Group | 4.97** | | 6.85** | | -3.31** | -3.27** |
| | (2.07) | | (2.09) | | (1.04) | (0.68) |
| Group Caused | | 6.52** | | 8.92** | 0.47** | -0.81* |
| Civilian Casualties | | (3.32) | | (2.49) | (0.15) | (0.42) |
| Group Caused | | | | 60.91** | | -0.73** |
| Govt Casualties | | | | (11.31) | | (0.29) |
| State Caused | | 7.22 | | 5.81** | 2.19** | 1.86** |
| Civilian Damage | | (4.69) | | (2.23) | (0.26) | (0.33) |
| State Caused | | 19.09 | | 12.76** | 6.21** | 2.22** |
| Group Damage | | (29.30) | | (33.98) | (0.97) | (0.62) |
| Territorial Goals | | -2.38 | | 3.42** | -0.45 | 1.05* |
| | | (9.82) | | (0.46) | (0.47) | (0.54) |
| Govt Ideology | | -36.44** | | -7.16** | 1.17 | 3.45** |
| | | (7.16) | | (0.39) | (1.11) | (0.92) |
| Time Since Last Response | | -0.27** | | -3.17** | -0.03 | -0.15** |
| | | (0.10) | | (0.36) | (0.04) | (0.06) |
| Ln GDP per capita | | | | | -0.61 | -2.34** |
| | | | | | (0.71) | (0.72) |

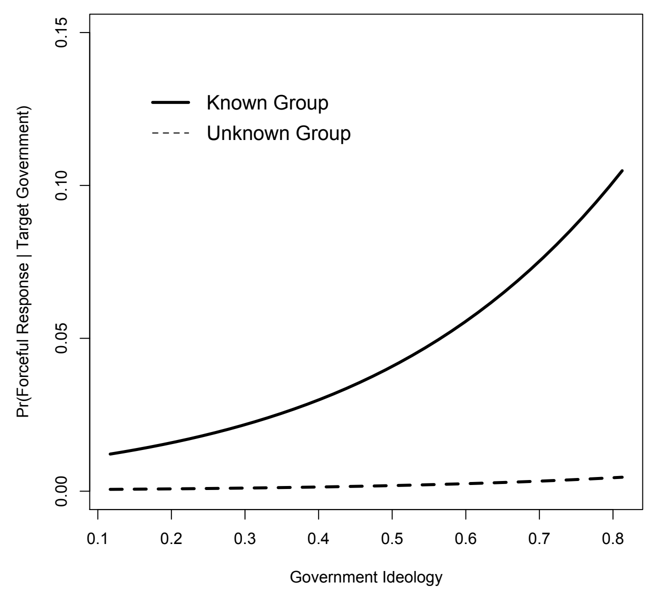
Number of Observations 14203
Group Standard Errors Bootstrapped
Government Standard Errors Clustered by Country
** Indicates Significance at 0.05 Level
* Indicates Significance at 0.10 Level




(a) Proportion of State Caused Damage Inflicted on Group

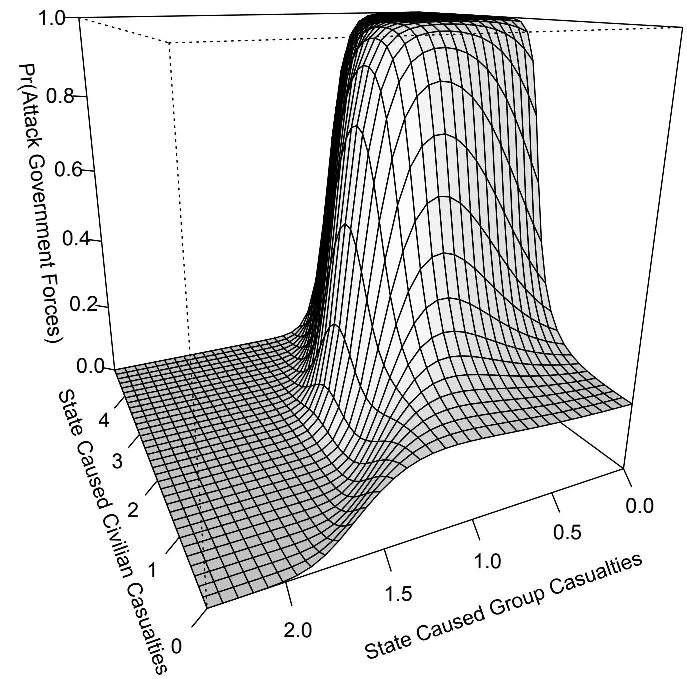



(b) Civilian Deaths and Government Response

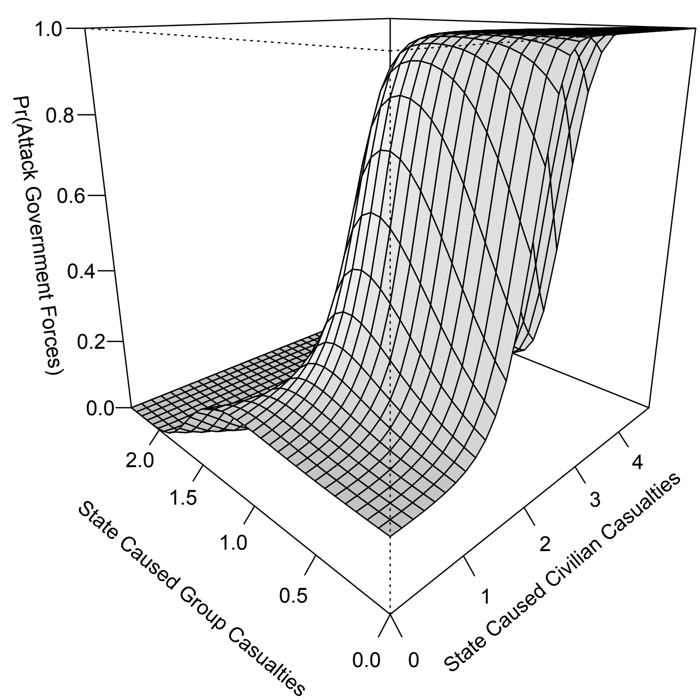



(c) Government Caused Group Casualties and Government Reaction

Figure 6: Government Response Following an Attack




(a) View 1




(b) View 2

Figure 7: Tactical Choice and State-Caused Civilian Casualties