THE LIFE CYCLE OF TERRORIST ORGANISATIONS

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That terrorist organisations come and go is a fact. This empirical fact tends to draw attention to the demise of the terrorist organisation and distracts from the dynamics of the terrorist organisation's life cycle. In this respect, the extant literature suffers from a serious weakness that is symptomatic of the absence from the literature of a rigorous theoretical explanation for the life cycle of terrorist organisations. This paper aims to address this by developing a theoretical explanation for the life cycle of terrorist organisations that is centred on competition for grassroots or popular support between the terrorist organisation and the government. The decline and demise of a particular terrorist organisation is not certain ex ante and a terrorist organisation may be expected to be most dangerous, not in its death throes, but during its early years as it competes with the government for grassroots support. These appear to be different conclusions to those that characterise some parts of the literature on this subject. The theoretical explanation developed herein also predicts a cyclical oscillation of conflict.

Key Words: Terrorist organisation, life cycle, grassroots support, conflict, demise, cyclical, defence

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It is not certain ex ante that a particular terrorist organisation must decline and ultimately expire. While terrorist organisations do come and go, the decline and demise of any particular terrorist organisation is not inevitable. To base policy recommendations on such a presumption may be far from sound. And, of course, even if decline and demise could be certainly assured, there is also the matter of how long this might take. It is critical to understand the dynamics of the life cycle of terrorist organisations. The problem that we face in developing this understanding is that the literature does not contain a rigorous theoretical framework that may be used to analyse the life cycle of terrorist organisations. However, there are some starting points within the defence economics literature where rigorous models of grassroots support and terrorist recruitment have been constructed. There is a general acceptance elsewhere too of the importance of popular grassroots support to the terrorist organisation's survivability. The purpose of this paper is to develop a rigorous theoretical explanation of the life cycle of terrorist organisations that has at its core the grassroots or popular support that appears to be so critical for the terrorist organisation.

A theoretical explanation of the life cycle of terrorist organisations must encompass several critically important things: (1) the importance of grassroots support for the survival of the terrorist organisation; (2) the intensity of the terrorist organisation's competition with the government for grassroots support; (3) the relative intensity of this competition for grassroots support in the early stages of conflict; and (4) the 'natural' life cycle of terrorist organisations—the historical fact that terrorist organisations in general have come and gone over time. Within such a theoretical framework, the terrorist organisation emerges only to eventually decline and fade away. This sequence of events may be compressed into a very short time or may occur gradually over a very long period. There is, theoretically, no limit on how long a particular terrorist organisation may exist. The theoretical framework encompasses the historical fact of the terrorist organisation's eventual demise without imposing a definite life-span upon a particular terrorist organisation. At the centre of the life cycle sits the grassroots support for the terrorist organisation. Competition for grassroots support shapes the timing and intensity of the terrorists' competition with the government. The grassroots support that is captured during the early stages of conflict will eventually shape the life cycle of the terrorist organisation.

The theoretical explanation developed in this paper encompasses these apparently important aspects of the empirical nature of terrorist organisations. The theoretical explanation developed in this paper depicts the terrorist group as competing aggressively with the government for grassroots support. The competition emerges because grassroots support has a future value for both the government and the terrorist organisation. Because grassroots supporters face 'switching' costs in changing their allegiance from one side to the other, intense competition between the government and the terrorist organisation ensues as each side attempts to secure supporters who will not be easily taken away in subsequent periods and who will in the future confer the benefits that saw them valued so highly in the first place. The switching costs faced by grassroots supporters that ensures both the higher intensity of competition for grassroots support during the early stages of conflict and the difficulty of taking supporters away from the other side in subsequent periods also generates a natural life cycle for the terrorist organisation. As time passes, the terrorist organisation will come to rely more heavily on

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existing grassroots supporters and will gradually lose supporters that are not replaced. Once its supporter base erodes completely, the terrorist organisation fades away. This may, however, take an inconveniently long time.

This paper is organised as follows. In Section II, a survey of the literature is presented. The literature survey focuses on those contributions that are relevant to the life cycle of terrorist organisations. These contributions are located within the defence economics literature and the political science and international relations literature. In Sections III and IV, the theoretical analysis is presented. The analysis presented in this paper relies on the application of the microeconomics that is usually used to analyse industrial organisation and, in particular, the relevance of switching costs to market share and strategic interactions among competitors within a market. The application yields results in the present context because terrorist organisations do compete with the government for a share of grassroots support and grassroots supporters must face costs—even if they are psychological rather than tangible—in changing their allegiance from one side to the other. The ways in which this grassroots support and the switching costs that grassroots supporters face shape the strategic interactions between the terrorist organisation and the government and, ultimately, shape the life cycle of the terrorist organisation is the main focus of the analysis. In Section V, the results and implications of the analysis are discussed and directions for future research are outlined. Section VI concludes the paper.

LITERATURE SURVEY

Terrorist organisations come and go. Some terrorist organisations only last for a very short period of time. Others last for a very long period of time. Two problems emerge from this empirical fact: (1) the problem of explaining the discrepancy in the life spans of different terrorist organisations; and (2) the temptation to conclude that because terrorist organisations do come and go that a particular terrorist organisation can be expected to eventually suffer the same fate. These two problems characterise the literature. The discussion contained within the literature identifies the empirical fact that terrorist organisations come and go and identifies various factors that contribute to sustaining or asphyxiating the terrorist organisation. The critical flaws inherent in the qualitative studies of this phenomenon are their inability to rigorously address the first of the problems that we have identified and, because of this less rigorous approach, their tendency to presume the inevitability of the decline and fall of particular terrorist organisations[2]. Only the more rigorous economic analysis of terrorist organisations' life cycles avoids these two pitfalls. This paper builds upon the very small amount of extant economic literature that directly addresses the life span of terrorist organisations.

The Empirical Facts
Crenshaw (1991) discusses the life span of terrorist organisations and attempts to explain how terrorism declines. Crenshaw presents an overview of the life spans of organisations with terrorist strategies. Although the list presented by Crenshaw (1991) contains many examples of terrorist organisations that existed for a very short

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[2] This presumption is problematic because it tends to obscure the fact that many terrorist organisations are very long lived. Even if every terrorist organisation must eventually decline and cease to exist, governments and their security agencies (and citizens) require analysis that incorporates the empirical fact that terrorist organisations come and go and the discrepancies in the life spans of different terrorist organisations. Even if we know that Terrorist Organisation A will eventually decline and fail like all those before it, we also need to know if and why this may take a very long time or a very short time. If it is a very long time, governments might be best advised to not treat the terrorist organisation as finitely lived at all.

period of time, at the time of her writing the list of terrorist organisations in existence for more than ten years was considerably longer than the list of terrorist organisations that had existed for up to ten years. This highlights the very wide discrepancy in life span that may characterise particular terrorist organisations even though the majority of terrorist organisations have tended to fade away relatively quickly (Rapoport 1992; Hoffman 1998). To reconcile Crenshaw's relatively long list of organisations that have existed for more than ten years and Rapoport's and Hoffman's observation that the majority of terrorist organisations exist for less than one year, it seems that we must conclude that many terrorist organisations or campaigns do not exist long enough or make enough of an impact in the public record to survive the sifting processes of data collection and academic inquiry. There are many obscure organisations, campaigns and causes that come and go very quickly. There are others that last considerably longer.

Factors Contributing to Life Span

The factors that may be responsible for bringing about the end of a terrorist organisation have been studied. Cronin (2006, p.17) lists the following seven factors: (1) capture or killing of the leader; (2) failure to transition to the next generation; (3) achievement of the group's aims; (4) transition to a legitimate political process; (5) undermining of popular support; (6) repression; and (7) transition from terrorism to other forms of violence. Cronin (2006, p.18) suggests that the factors are both internal and external. This relative complexity undermines attempts by researchers who focus narrowly on one particular factor. The interaction between several factors may ultimately be responsible for the demise of a terrorist organisation and even the careful analysis of the most obvious of these may not necessarily permit clear cut conclusions to be reached. Furthermore, within each of these seven factors there may be 'sub-factors' at play. For example, the failure of a terrorist group to transition to the next generation may be due to: (1) the inability of the organisation to articulate a clear vision; (2) the nature of the ideology itself; or (3) the mismanagement internally within the terrorist organisation of the transition to a new leadership group (see Cronin 2006, p.23).

Despite the complexity and interaction between factors, it seems as though grassroots or popular support stands out as a very important factor in the determination of the longevity of terrorist organisations. Supporting this argument is the fact that terrorist organisations with an ethno-nationalist cause, which may be expected to be in a position to garner support from a local population of the same ethnicity, tend to have longer life spans than terrorist organisations with either leftwing or rightwing causes (Crenshaw 1991; Cronin 2006). Cronin (2006, p.27) states, "Terrorist groups generally cannot survive without either active or passive support from a surrounding population. Examples of active support include hiding members, raising money, and, especially, joining the organisation." The populace may adopt a more passive approach in its support of a terrorist organisation but even acts of passive support such as not cooperating with police or not reporting relevant information to investigators can also be very important (Cronin 2006, p.27). Once popular support declines, the terrorist organisation is starved of a critical part of its sustenance and its ongoing operation is placed in considerable jeopardy.

Grassroots Support and Economics

Within the economics of defence (terrorism) literature, Faria and Arce (2005) have constructed a dynamic model in which popular support is the 'bridge' between terrorist activities and terrorist recruitment. As Cronin (2006) indicates, one of the reasons why grassroots support may be important to the terrorist organisation is its supply of recruits. The Faria and Arce (2005) analysis represents some of the first steps towards incorporating those aspects of popular support into economic models of terrorism that had been incorporated into models of guerrilla warfare and civil war (Intriligator and Brito 1988; Azam 2002; Grossman 1995; Mason 1996). The Faria and Arce analysis is similar to Rosendorff and Sandler (2004) where popular opinion and support for terrorism also operates as a factor that influences terrorist recruitment. However, it is Siqueira and Sandler's (2006) analysis that most fully embeds grassroots support within a model of strategic interaction between the terrorist organisation and the government within a context that considers the life cycles of transnational terrorist organisations.

Siqueira and Sandler (2006) examine two scenarios: (1) a scenario where the terrorist organisation has a fragile supporter base that reduces support for the terrorist organisation when the government mounts a counter-terrorism offensive; and (2) a scenario where the terrorist organisation builds its grassroots support by undertaking terrorist operations that follow government actions that have caused disaffection among the populace. In general, the terrorist organisation attracts supporters by expanding its terrorist activities while the government attracts supporters by providing goods and services. The competition is examined game-theoretically. The Nash equilibrium in each of the two scenarios generates insights into the strategic competition between the terrorist organisation and the government for grassroots supporters. When the terrorists have a fragile supporter base, both the terrorist organisation and the government are better off when the terrorist organisation deescalates its operations. When the terrorists have a strong supporter base, the government escalates its counterterrorism measures and avoids an escalation by the terrorists but, in so doing, augments the terrorist organisation's grassroots support.

The economic analysis of terrorism is well suited to the formal and rigorous investigation of the variables interacting simultaneously at several (or more) margins. Siqueira and Sandler have provided a model that incorporates grassroots support into the strategic interaction between the terrorist organisation and the government. Although the extant contributions provide many insights into the role that grassroots supporters may play in a strategic interaction between the terrorist organisation and the government, it is clear that many extensions to the literature are possible. The patterns and trends that emerge in the economists' time series analysis of terrorist incidences provide part of the picture (see Mickolus (1980; 1983); Im, Cauley and Sandler (1987); Weimann and Brosius (1988); Enders, Parise and Sandler (1992); and Enders and Sandler (2002)). The patterns and trends that are extracted from the careful analysis of the histories of particular terrorist organisations provide another part. Terrorist organisations come and go. Some exist for a very long time and some exist for a very short time. There are many contributing factors to the longevity of terrorist organisations. Of these, grassroots support appears to be of particular importance. It seems to play an important role in sustaining terrorist organisations and its dissipation seems to have played an important role in the demise of terrorist organisations.

Conclusions from the Literature

The life cycle of terrorist organisations presents a number of challenges to researchers. In particular, the discrepancy in the longevity of terrorist organisations is an empirical fact whose explication may hold strategic benefits for governments and their security agencies. The interaction of at least several different factors appears to lie at the heart of terrorist organisation survival. Of these, grassroots support appears to be especially important and grassroots support has been accorded some degree of attention in the literature. Despite the work that has been done in this field, a theoretical explanation for the life cycle of terrorist organisations that incorporates grassroots support has not yet emerged. Without a relatively rigorous theoretical explanation for the life cycle of terrorist organisations, governments and their security agencies (and, of course, researchers) risk forming misguided expectations about the dynamics of the life cycles of specific terrorist organisations. With a sound theoretical explanation of the terrorist organisation's life cycle in hand, governments and their security agencies can assess the divergences of individual terrorist organisations from the 'representative' organisation of the theoretical model and develop policy responses based on this analysis. At the very least, this will ensure that no government or security agency forms its policies regarding particular terrorist organisations based on the historical facts that have tended to characterise terrorist organisations in general.

THE TERRORIST ORGANISATION'S LIFE CYCLE AND GRASSROOTS SUPPORT

A theoretical explanation for the terrorist organisation's life cycle is required. This explanation must incorporate the following features of terrorist organisations: (1) the importance of grassroots support for the survival of the terrorist organisation; (2) the intensity of the terrorist organisation's competition with the government for grassroots support; (3) the relative intensity of this competition for grassroots support in the early stages of conflict; and (4) the 'natural' life cycle of terrorist organisations—the historical fact that terrorist organisations in general have come and gone over time (but sometimes quickly and sometimes not so quickly). A key piece of economic theory can be placed at the centre of any attempt to build such a theoretical explanation. This piece of economic theory is called 'switching costs'. The concept is simple. Grassroots supporters of either the terrorist organisation or the government face costs (which may be tangible or psychological) in changing their allegiance from one side to the other. These switching costs shape grassroots support and competition for it in a manner that, once recognised and incorporated into a formal model, encompasses all of the features that we wish to incorporate into our theoretical explanation of the life cycle of terrorist organisations.

Farrell and Klemperer (2006) review the switching costs literature. Switching costs arise whenever individuals face some costs if they change their behaviour. Much of the time, in various human activities, switching costs will manifest themselves. Grassroots support of terrorism is no different. Grassroots supporters who are aligned with the terrorist organisation or the government will almost certainly face costs in switching their allegiances. These costs may be tangible costs that might even be imposed by the terrorist organisation or the government. Or the costs may be psychological and derive from the psychological investment that supporters have made in a particular direction (see Klemperer 1995, p.517). The terrorism literature identifies grassroots support as being of importance to terrorist organisations and, by implication, the government. Switching costs imply that this importance is actually of a greater magnitude than analysts may suppose. Once grassroots supporters align with

one side or the other, the switching costs that they face in changing their allegiances makes it harder for the opposition to lure them away. The value of grassroots support, which is likely higher than any analysis that does not consider switching costs will conclude, ensures that there will be intense competition for it in the early stages of a conflict. In later stages of conflict, 'locked in' grassroots supporters will continue to shape both the conflict and the life cycle of the terrorist organisation.

The way in which grassroots supporters with switching costs shape the conflict and the life cycle of the terrorist organisation can be explained as follows. First of all, grassroots support has a value. This is readily acknowledged within the terrorism literature. This value is the source from which competition for grassroots support derives. If it had no value, there would be no competition for it. Second, because grassroots supporters face positive costs in changing their allegiances, the value that can be extracted from grassroots support is magnified. Grassroots supporters with switching costs can be taken more for granted than those who could change their allegiances easily and will not be easily lured away in the future. Securing grassroots support is even more important in a positive switching costs environment. Third, because of what we have just said, there will be more intense competition for grassroots support than would be predicted by analysis that does not consider the switching costs of grassroots supporters and, what is more, this intensity will be highest during the initial stages of a conflict when grassroots supporters have yet to align with one side or the other. Fourth, the share of grassroots support that is secured in these initial stages of a conflict shapes the life cycle of the terrorist organisation. As we shall see, share of grassroots support will tend to dissipate over time as the dynamics of the environment that we have sketched make themselves felt. By securing a large share of grassroots support during the early stages of the conflict, the terrorist organisation may prolong its life. Eventually, as its grassroots support erodes, the organisation fades away. Terrorist organisations that are not successful in securing grassroots support early in their campaigns will fade away more quickly than terrorist organisations that compete more successfully for grassroots supporters.

This heuristic discussion of the dynamics of grassroots support, switching costs and the life cycle of terrorist organisations is reinforced with a more formal theoretical development in the next section. The formal theoretical explanation that is developed there can be outlined intuitively as follows. In the theoretical explanation developed in the next section, the terrorist organisation competes with the government for grassroots support in an initial period. The terrorist organisation competes by undertaking terrorist operations and the government competes by providing goods and services and undertaking counterterrorist operations. Because of switching costs, any grassroots supporters that are secured will exhibit 'inelastic support' in subsequent periods. This encourages the terrorist organisation to provide a lower level of terrorist activity to its grassroots supporters in subsequent periods (because they know they will not be easily enticed away). Essentially, the terrorist organisation exploits its supporters and dissipates any advantage in its share of grassroots support. A large initial advantage over the government in terms of share of grassroots supporters will confer a longer life upon the terrorist organisation but the dynamics of the environment ensure that this advantage will eventually be eroded. When there are other rivals for grassroots support, the situation is characterised not by an advantage-disadvantage to either the terrorist organisation or the government but by the eventual dissipation of grassroots support. The theoretical model describes a mechanism that explains the

empirical observation that terrorist organisations come and go more or less quickly. Terrorist organisations that secure a lot of grassroots support and face no competition other than the government may persist for a very long time. Terrorist organisations that cannot secure grassroots support and face other rivals (in addition to the government) will fade away very quickly.

EXPLAINING THE LIFE CYCLE OF TERRORIST ORGANISATIONS

The basis for our explanation is the duopoly competition with switching costs model developed by Farrell and Shapiro (1988)[3]. This theoretical framework is useful for the analysis of the terrorist organisation's life cycle because its infinite-period overlapping generations characteristics permit the dynamics of conflict and survival to be more suitably analysed. A finite period model is not suitable for this purpose. The scenario is one in which the terrorist organisation and the government compete for a share of grassroots support. The context is characterised by duopoly. Grassroots support is valuable. Along with Siqueira and Sandler (2006), it is assumed here that the government competes for grassroots support by providing goods and services to the populace and undertaking counterterrorist activities. The terrorist organisation competes for grassroots support by undertaking terrorist operations. The utility of the terrorist organisation and the government is a function of the share of grassroots support that they are able to secure. Grassroots supporters leave the environment[4] and are replaced by potential supporters as yet unattached to either side.

Some of the formal aspects of the explanation may be set out in the following short list of assumptions:

Assumption 1: Utility U for each side is a concave increasing function of share of grassroots support, σ.

Assumption 2: The utility of the government is $U(\sigma)$ and the utility of the terrorist organisation is $U(1 - \sigma)$.

Assumption 3: Grassroots support is a function of the goods and services provided by the government and the terrorist operations undertaken by the terrorist organisation. We denote the monetary equivalent of these activities by x_G and x_T respectively. With x measured in standardised units, $\sigma(x)$.

Assumption 4: Grassroots supporters exit the market at a rate of ϕ per unit of time with a fraction $f(x_T - x_G)$ of new potential grassroots supporters selecting the terrorist organisation. This is Farrell and Shapiro's (1988, p.136) specification. However, unlike Farrell and Shapiro (1988), $f'(x_T - x_G) > 0$.

Within the Farrell and Shapiro (1988) analysis, ½ is an equilibrium market share. In the first instance, we interpret this equilibrium point of ½ the share of grassroots support as a point of balance or neutrality with

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[3] The pertinent analysis is contained in the appendix to Farrell and Shapiro (1988).

[4] In this manner the theoretical explanation provided here incorporates all of those factors that might be responsible for declining grassroots support. For example, Cronin (2006, pp.27-28) lists apathy, disinterest and revulsion with the terrorist organisation.

neither the terrorist organisation nor the government having an advantage[5]. Within the context that has been set down, a 'neutral' equilibrium position will emerge at ½ the grassroots supporters drifting towards one side and ½ drifting towards the other side. In the heuristic discussion of the previous section, we referred to an 'advantage' in share of grassroots support. This can now be defined as a fraction in excess of ½. Later, we shall extend the analysis to include the possibility that grassroots supporters may drift towards other organisations and causes. These other 'causes' do not necessarily have to be political. By treating these alternatives very generically we can account for the possibility that members of the populace simply lose interest altogether in any ongoing conflict between terrorists and the government. Under these circumstances, effective grassroots support for the terrorist organisation may drift towards zero.

The Dynamic Motion of Grassroots Support

The formalism deployed by Farrell and Shapiro (1988) can be applied analogously to the context that has been sketched here to model the dynamics of the terrorist organisation's share of grassroots support and, ultimately, its life cycle. There are only two equations required to do this:

$$\sigma = -\phi\sigma + \phi f(x_T - x_G) \tag{1}$$

$$H = \sigma U(x_T) + \lambda\big(-\phi\sigma + \phi f(x_T - x_G)\big) \tag{2}$$

Equation (1) expresses the dynamics of the movement over time of the terrorist organisation's share of grassroots support. Equation (2) is the Hamiltonian where $\lambda = dU/d\sigma$ and $x_T(\sigma)$ satisfies $\partial H/\partial x_T = 0$ (see Farrell and Shapiro 1988). Although these are equations that have been applied elsewhere in economic analysis for a long time, it is easy to see how useful the formalism is and how valuable it may be if fully developed within the economic analysis of terrorism. The share of grassroots support that is enjoyed by the terrorist organisation fluctuates over time as existing supporters exit and new potential supporters enter and make their choice between the terrorist organisation and the government based on x_T relative to x_G. The utility enjoyed by the terrorist organisation over time depends on the amount of grassroots support they can secure. Because of their switching costs, grassroots supporters do not change sides once they are secured but do gradually exit the environment over time. The task becomes one of balancing the relatively easy maintenance of grassroots support secured in earlier periods with the necessity of competing more intensely (by increasing x_T relative to x_G) for new potential supporters who have entered the environment.

There is another[6] significant difference between the Farrell and Shapiro (1988) analysis and its analogue as applied here. This difference is that the side with the highest share of grassroots support will decrease x. If x_T was a price, it would be increased by the terrorist organisation if the terrorist organisation secured a larger share of grassroots support than the government. Equations (1) and (2) would be characterised by a premium of x_T over x_G when the terrorist organisation took a leading position (and vice versa). In our analysis, by contrast,

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[5] We do not literally interpret this as 50 percent of the populace supporting one side or the other. At most, it can be interpreted as 50 percent of the 'politicised' populace. We prefer to treat ½ as a point of neutrality or no advantage-disadvantage to either side.

[6] See Assumption 4 (above).

equations (1) and (2) are characterised by a discount of x_T below x_G when the terrorist organisation takes a leading position (secures more grassroots support than the government) (and vice versa). The value (and utility) of the share of grassroots support to the terrorist organisation is established by the discount of terrorist activity to government goods and services provision that can be provided to secured grassroots supporters. With less expenditure of resources, the benefits (whatever they may be) of grassroots support may be enjoyed. That is, for the terrorist organisation when share of grassroots support is greater than ½, $\Delta x_T < 0$ (and vice versa).

The equations (1) and (2) that formally set down the motion for the share of grassroots support enjoyed by the terrorist organisation and the government paint a picture of oscillating conflict and competition through time. Grassroots support has a value. For this reason, the terrorist organisation and the government compete for it. Securing an advantage over the government in terms of share of grassroots support enables the terrorist organisation to enjoy the utility derived from grassroots support and simultaneously reduce the expenditure of the resources involved in undertaking terrorist operations. Once secured, grassroots supporters can be satisfied with a lower level of terrorist activity. Their switching costs ensure their allegiance. As the terrorist organisation winds back its activities, it gradually loses grassroots support as supporters leave the environment and new supporters face the choice between the terrorist organisation (with a now lower output of terrorist activity) and the government (which has been increasing x_G in order to entice unattached supporters). The government will eventually gain the upper hand only to face renewed competition from the terrorist organisation (which increases x_T as its share of grassroots support falls into a relative disadvantage against the government). The converse dynamics will hold, of course, if the government initially gains the larger share of grassroots support.

Erosion of Grassroots Support and the Cyclicality of Conflict

The most important point about the dynamics is that advantages in grassroots support will be eroded. Conflict will be cyclical with the length of the cycle dependent upon the length of time it takes for grassroots support to erode. Intense competition in the early stages of the conflict will, if a clear advantage to one or the other is established, give way to reduced conflict as the side with the advantage reduces *x*. Conflict will increase in intensity as the advantage turns to disadvantage and the side that has observed its support slipping away decides to increase *x* in an attempt to re-establish its ascendancy. This coincides, of course, with a decrease in *x* by the side that has taken the lead in share of grassroots support. There is, like the Siqueira and Sandler (2006) analysis, an inherent tendency towards for conflict to be curtailed and equilibrium to be established in a conflict that continues long enough for these dynamics to work themselves out. The analysis developed in this paper contributes to the literature further by showing that an ongoing conflict between a terrorist organisation and a government is likely to exhibit cyclicality.

Encroachments on Pure Duopolistic Conflict

To this point, the environment has only included the terrorist organisation and the government. There may be other competitors for grassroots support. The terrorist organisation and the government may not compete in a pure duopoly for grassroots support. There may be other terrorist organisations or legitimate political causes to support. Or some members of the populace may become depoliticised and prefer to allocate attention and resources to other things. In this more realistic scenario, new unattached grassroots supporters may remain

unattached to either the terrorist organisation or the government. Gradually, the terrorist organisation will lose its existing supporters and be unable to replace them. When grassroots supporters have switching costs, there is a natural life cycle for the terrorist organisation. The terrorist organisation that obtains a larger share of grassroots support relative to the government (and other competitors) will experience a relatively longer life span as its relatively larger number of grassroots supporters are gradually dissipated and it attracts fewer and fewer of the new and unattached potential supporters. Eventually, the terrorist organisation will not attract any new unattached supporters. As its existing supporters gradually exit, the terrorist organisation fades away. This course of events will happen relatively more rapidly for the terrorist organisation that is unable, in the initial stages of conflict, to secure a sufficient share of the grassroots support.

Resources Mismatch

The dynamics of the conflict may be shaped by a mismatch in resources between the government and the terrorist organisation. The government may be able to draw on a much deeper reservoir of resources than the terrorist organisation. Formally, the duopoly may be asymmetric in favour of the government and the government's utility function relatively less concave. Under these circumstances, which probably characterise the majority of terrorist-versus-government scenarios, there is an increase in the speed of the oscillation in the conflict and the life span of the terrorist organisation contracts or shrinks. If it can initially seize the advantage in terms of share of grassroots support, the terrorist organisation reduces x_T and its grassroots support begins to dissipate. The government increases x_G to compete with the terrorist organisation. The terrorist organisation's advantage turns to disadvantage. Unlike the terrorist organisation, however, the well-resourced government with a less concave utility function experiences less sensitivity in $\sigma U(x_G)$. The government does not reduce x_G by as much as the terrorist organisation would reduce x_T if it were in the same situation. Consequently, the government's rate of replacement of exiting supporters with new unattached supporters is relatively high. It can maintain its advantage for longer. The terrorist organisation may be asphyxiated before it ever regains an advantage in share of grassroots support.

DISCUSSION AND POLICY IMPLICATIONS

Terrorist organisations come and go. There is, however, no set limit on how long a terrorist organisation might survive. Governments cannot and should not make policy decisions based on the empirical fact that terrorist organisations eventually decline because this empirical fact, on its own, has no substantial policy implications. It is only as part of a sound theoretical explanation for the life cycle of terrorist organisations that this empirical fact obtains its policy relevance. In this paper, a theoretical explanation is developed that encompasses several critically important aspects of the terrorist organisation's life cycle. At the centre of the explanation sits grassroots support and the assumption that these supporters may face costs (tangible or psychological) in changing their allegiances once they have decided to support either the government or the terrorist organisation. The intense competition for grassroots support in the early stages of conflict reveals the value that each side attaches to it. Once secured, grassroots supporters do not easily change their allegiances and the side with the advantage in terms of share of grassroots support can reduce the amount of resources directed towards these 'locked in' supporters. As these existing supporters gradually exit the environment, the supporter base erodes

and drifts back towards a neutral point. The other side may then take the advantage. The process repeats and oscillates around the equilibrium neutral point of ½ the grassroots supporters with escalations in conflict arising cyclically (or periodically) as the terrorist organisation finds itself at a disadvantage in terms of share of grassroots support and escalates its production of terrorist attacks.

This theoretical explanation for the terrorist organisation's life cycle encompasses several critically important things: (1) the importance of grassroots support for the survival of the terrorist organisation; (2) the intensity of the terrorist organisation's competition with the government for grassroots support; (3) the relative intensity of this competition for grassroots support in the early stages of conflict; and (4) the 'natural' life cycle of terrorist organisations—the historical fact that terrorist organisations in general have come and gone over time. What emerges from the analysis is a terrorist organisation that competes with the government for a share of grassroots support. Because of the value of the grassroots support and the importance that it holds for the longevity of the terrorist organisation, competition is likely to be very intense in the early stages of conflict. The terrorist organisation will enjoy a relatively longer life if it can secure a large advantage in grassroots support above the equilibrium neutral point of ½-share. Erosion of the advantage occurs and the terrorist organisation may drift into a disadvantageous position relative to the government. An escalation in terrorist attacks may win unattached supporters and the terrorist organisation will try to do so if it has the resources. When the terrorist organisation and the government are relatively equally matched[7], this cyclical oscillation may repeat for any length of time.

When the Terrorist Organisation is Most Dangerous

It is tempting to conclude, as Cronin (2006) does, that terrorist organisations will be most dangerous in their death throes. This, however, is not necessarily the case. In fact, if securing a share of grassroots support is critical to the longevity of the terrorist organisation, competition is likely to be more intense in the early stages of a conflict. The utility of the terrorist organisation is a function of the share of grassroots support that it can secure. This implies intense competition in the early stages of a conflict when grassroots supporters are unattached and the future value of a share of grassroots support is highest. After the initial shares of grassroots support have been determined, the terrorist organisation may find itself at an advantage. It will reduce its flow of resources into terrorist attacks and its grassroots supporter base will gradually erode. Alternatively, the terrorist organisation may find itself at a disadvantage. If it can, it will maintain or increase its flow of resources into terrorist attacks. The government's advantage is, of course, slowly eroding as it winds back the resources flowing into goods and services provision (and counterterrorism). The relatively greater x_T over x_G entices new unattached supporters to the terrorist organisation. If the terrorist organisation can gain an advantage in terms of share of grassroots support, its terrorist attacks will subside. This cyclical oscillation may continue indefinitely if sufficient resources are available to each side. Terrorist organisations that have the necessary resources are likely to be dangerous in the early stages of conflict or until they secure an advantage in terms of share of grassroots support. The danger will subside at this time and may enter a long lull as the terrorist organisation's grassroots supporter base gradually erodes. Conflict may be sparked again once this falls below the neutral

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[7] This need not be on absolute terms. For example, a government may be able but unwilling to devote resources towards goods and services designed to win grassroots support. The resources that it does devote may be equal, less than or greater than the terrorist organisation.

equilibrium ½-share. It is not the death throes of the terrorist organisation that are salient but its share of grassroots support.

The Cyclical Oscillation of Conflict

The equilibrium neutral ½-share point is the point around which the share of grassroots support will oscillate cyclically. Quite unexpectedly, therefore, an empirically testable prediction emerges from the theoretical explanation. Empirical work that is extant in the literature has detected a cyclical pattern in the empirical time series of terrorist incidences. The theoretical explanation developed in this paper predicts a cyclical pattern that is dependent upon fluctuations in share of grassroots support. As the terrorist organisation changes its level of x_T in response to the share of grassroots support that it secures, the terrorist attacks that it perpetrates will increase and decrease in intensity. If the terrorist organisation is successful in securing an advantage in terms of share of grassroots support, a relative lull in terrorist activity is to be expected. Terrorist operations will increase in intensity once the terrorist organisation becomes aware that its base of grassroots support has eroded to such an extent that it is confronting a disadvantage relative to the government. It has already been explained that this oscillation may continue for as long as resources are available to sustain it.

The Dynamic Erosion of Grassroots Support

The theoretical work developed in this paper encompasses elements of the dynamics of the terrorist organisation's life cycle and grassroots supporters. Grassroots supporters do not have infinite lives. They are not infinitely lived and, what is more, their 'political lives' may be considerably shorter than a human lifespan. Grassroots supporters must eventually exit the environment and be replaced by new unattached potential supporters. If it secures an advantage in terms of share of grassroots support, the terrorist organisation reduces its allocation of resources to terrorist activities and enjoys the utility conferred by grassroots support at a lower level of terrorist activity. The theoretical explanation developed in this paper allows for the terrorist organisation to drift into more mainstream or legitimate political activities once it secures an advantage of share of grassroots support. However, its terrorist roots remain. It need not reduce its terrorist activities to zero. Even it does, it cannot be expected to remain wholly legitimate in the face of dissipating grassroots support. Terrorist activity is how it attracts unattached potential supporters. The theoretical explanation of the terrorist organisation's life cycle that has been developed here reveals an organisation that will be clearly a terrorist organisation while it competes for grassroots supporters. It may then enter a less terroristic or even legitimate phase as it enjoys the grassroots support that it has secured. Terrorism may once again characterise the organisation as its grassroots support falls into relative disadvantage. These are the dynamics of the terrorist organisation and its share of grassroots support.

The Terrorist Organisation's Final Demise

The demise of the terrorist organisation may come very quickly. If it cannot secure an advantage in terms of share of grassroots support the terrorist organisation may fade away quickly. It cannot compete forever. With limited resources, an inability to secure support signals a very quick demise for the terrorist organisation. When the terrorist organisation secures an advantage in terms of share of grassroots support, it may last a very long time. Gradually, its supporter base will be eroded but if the terrorist organisation has the necessary resources it

will be able to escalate its level of terrorist operations as its share of support falls into disadvantage and, perhaps, re-establish an advantage. This cyclical oscillation may continue indefinitely if the resources are available to sustain it. Unfortunately for the terrorist organisation, matters are unlikely to be so simple. Rather than perpetual duopolistic competition with the government, the terrorist organisation is also likely to face competition from rivals. These may include non-political causes[8]. The grassroots supporters that are initially secured gradually exit the environment but their replacements are attracted to things other than the terrorist organisation. Over time, the terrorist organisation facing these circumstances must eventually face an ultimate demise.

The Policy of the Government and its Security Agencies

The emergence of the terrorist organisation initiates a competition for grassroots support. The government may aggressively compete or not. In its decision, the government must be aware that failure to stop the flow of grassroots support to the terrorist organisation may prolong the life of the terrorist adversary. The government will always make decisions that rest on the balances and trade-offs that the government perceives to characterise the situation. What is clear is that no decision can be made on the basis that 'all terrorist organisations end'. The empirical fact that terrorist organisations come and go is not relevant to the policy of the government in specific cases. The dynamics of the terrorist organisation's life cycle and the patterns of violence that characterise its actions are shaped by the dynamics of the grassroots support in each particular case. A terrorist organisation that is permitted to hold its advantage in share of grassroots support may endure for a long period of time. Furthermore, it may reignite tensions and violent conflict if at some future point it perceives that its grassroots support has eroded to such a degree as to place it in danger of losing its advantage to the government. Government policy is not to be shaped or influence by the observation that terrorist organisations come and go. Government policy is to be shaped by the careful working through of the dynamics likely to characterise a terrorist organisation in each special case and an assessment of the effect of those dynamics on the lives of its citizenry and principles.

CONCLUSIONS

The life cycle of the terrorist organisation may shape the nature of its interaction with the government over time. One empirical fact regarding terrorist organisations' life cycles has attracted most of the attention. This is the fact that terrorist organisations tend to come and go. The discrepancy in the life spans exhibited by different terrorist organisations has generated a number of investigations into the factors that determine their longevity. These mostly qualitative investigations outline a number of factors that contribute to the longevity of terrorist organisations. One of the most important appears to be grassroots support. Losing support among the populace seems to be associated with the demise of the terrorist organisation whilst terrorist organisations that enjoy strong popular support tend to be among the most long lived. Incorporating grassroots support into a theoretical explanation for the dynamics of the terrorist organisation's life cycle is the objective of the analysis developed in this paper. Only with a more rigorous theoretical explanation for the terrorist organisation's life cycle can the

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[8] The specification is not important. As explained previously, grassroots supporters may simply become fatigued with the struggle or disinterested in the terrorists' cause. Life presents many possible alternatives to politics as outlets for energy and attention.

temptation to concentrate too much attention on the demise of the terrorist organisation be avoided. Terrorist organisations come and go but it is the dynamics of their life spans that holds most interest for governments and their security agencies. Not the (indeterminable) date of their demise.

A theoretical explanation for the dynamics of the terrorist organisation's life cycle that embeds grassroots support into the analysis has been constructed in this paper. A possibility that has been overlooked within the literature up to this point plays a leading role in the analysis. This is the possibility that grassroots supporters have switching costs. Once they choose to support a cause, they face costs in switching their allegiances. These may be tangible costs or psychological costs. This shapes the dynamics of the environment in important ways. It increases the value of grassroots support and increases the intensity with which the terrorist organisation competes for it. This intensity is likely to be highest in the early stages of conflict. Once grassroots support is secured, the terrorist organisation will reduce the flow of resources to terrorist activities and enjoy the benefits conferred by holding an advantage in terms of share of grassroots support. Its grassroots supporter base gradually erodes over time as existing supporters exit the environment and new unattached potential supporters make a decision between the terrorist organisation and the government. A re-emergence of conflict may be observed as the terrorist organisation perceives its share of grassroots support has eroded sufficiently to place it at a disadvantage relative to the government. A cyclical oscillation of conflict will be observed for as long as there are sufficient resources available.

Grassroots support is critical to the survival of the terrorist organisation. If the terrorist organisation cannot secure a sufficient share of grassroots support during the early stages of conflict its lifespan may be very short. If it does not suffer an early demise, the terrorist organisation's life cycle may be characterised by cyclical oscillation of duopolistic conflict with the government. This conflict may continue for a very long time if resources are sufficient to sustain it. However, there may be other competitors for grassroots supporters besides the government. The dynamics of grassroots support need not oscillate between the terrorist organisation and the government. As grassroots supporters for either side gradually exit the environment, the new and unattached potential supporters may be attracted elsewhere. This 'elsewhere' may be non-political and may occur for any number of reasons, including disinterest or revulsion with the terrorist organisation. Over time, the terrorist organisation's grassroots support may dissipate entirely and the organisation will fade away. A theoretical explanation for the dynamics of the terrorist organisation's life cycle predicts intense competition in the early stages of conflict which, if the terrorist organisation obtains sufficient grassroots support, will be followed by a cyclical oscillation of conflict. Terrorist organisations come and go. It is not this empirical fact that is important but the empirical evolution of the dynamics of a particular terrorist organisation's life cycle.

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