On the Duration and Sustainability of Transnational Terrorist Organizations

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Abstract

This paper aims to improve our understanding of how transnational terrorist organizations emerge, survive, thrive, and eventually die. We use a data set that catalogues terrorist organizations and their attacks over time (the ITERATE data base of thousands of terrorist events from 1968 through 2007) and merge those data with socio-economic information about the environment in which each attack occurs. We use these data to trace the life-cycle pattern of terrorist activity and the organizations that perpetrate them. We identify at least two types of terrorist organizations – recidivists and one-hit wonders. We find that recidivist organizations, those that have repeatedly attacked, are less likely to survive once political and socio-economic factors have been included. However, we find that sporadic or one-hit wonders are not easily deterred by socio-economic factors, leaving open a role for counter-insurgency tactics.

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I. Introduction

Following the 9/11 terrorist attacks, researchers from all disciplines re-focused attention on policy questions relating to the nature of the terrorism and the best ways to combat it. Research efforts have proved fruitful in addressing various pieces of this puzzle, and we now have some partial answers. First, we better appreciate that the threat has always been there, simply dormant in some places and some times. We also now recognize that the threat is complex, motivated mainly by political and religious ideologies, and does not readily yield to conventional physical force alone. We can do more to protect ourselves, but perfect invulnerability will likely prove elusive.

Still, much remains to be learned, especially in our understanding of how terrorist groups organize themselves and behave over time. This paper aims to improve our understanding of the life-cycle dynamics of transnational terrorist organizations by examining the patterns of their attacks over time. In particular, we will show that terrorist organizations – like more conventional "firms" – display patterns of negative duration dependence: the younger an organization becomes the more likely it is to die in the next period. We also argue that these organizations differ substantially in their ability to sustain violent attacks. We explain part of these differences—but not all—using the characteristics of the environment in which the attacks are staged.

Within the political economics community, some notable papers pre-date the post 9/11 literature. Sandler, Tschirhart, and Cauley (1983) were one of the first to analyze transnational terrorism in a rational framework, and their work led to a cottage industry of papers focused on modeling the game theoretic and strategic interactions of terrorists and policy-makers in hopes of increasing our understanding of terrorist motivations. Rapoport (1992) is perhaps the most

widely cited research analyzing terrorist organizations. Rapoport (1992) catalogues and describes terrorist organizations and links their survivorship to economic and political factors, among other phenomena, but his work ends with close of the Cold War.

Thus, a primary contribution of this paper is to provide a comprehensive empirical exploration of the survivorship patterns of transnational terrorist organization through 2007 as measured through their capacity to mount attacks across successive periods. In doing so, we explore the extent to which political economic theories help explain the behavior of terrorist organizations. Analysis of survivorship relies on a set of techniques, variously known as hazard models, duration analysis, and time-to-failure models. Although the models can differ slightly in their estimation approach, they all share an interest in estimating the probability of an organization surviving from one period to the next. For example, it is well known that many new businesses fail in the first year, but if a business survives that first year what is the probability of it surviving through year 2? If it survives year 2, what is the probability of it surviving through year 3? And so on.[1] A few papers have employed duration analysis to investigate individual events or individual terrorist group activities. Atkinson, Sandler and Tschirhart (1987), in one of the first such papers, investigate the duration determinants of a hostage event. Barros, Passos, and Gil-Alana (2006) used hazard models to analyze the duration and survivorship of ETA. Berrebi and Lakdawalla (2007) applied survival analysis techniques to localities at risk of terrorist attacks in order to estimate the temporal determinants of terrorism risk in Israel.[2]

Still, none of these papers employs econometric techniques to analyze patterns for the *population* of transnational terrorist events and terrorist organizations. The paper that comes closest to our approach is Dugan, LaFree, and Miller (2009), who examine the trajectories of all

terrorist organizations from 1970 to 1997. Their approach has significant limitations, however. First, their data end well before 9/11 and therefore miss any changes in the terrorism landscape since then. Second, they also use a larger but less specific data set, which conflates domestic and international terrorist events. Moreover, these papers and the previous literature have not sought to explain the duration or life-cycle properties by using the data to test relevant political economic theories. In short, no paper has specifically considered the full range of transnational terrorist activity when estimating the life-cycles of these organizations. Thus, our paper fills two significant gaps in the recent literature: it updates the empirical picture of transnational terrorist activity and it applies an innovative analytical framework to analyzing the durability of terrorist organizations.

In considering questions about the durability of transnational terrorist activity, we pose several hypotheses. First, we argue that for the full sample the direction of duration dependence will depend on the extent to which "one-hit wonders" play a role. If one-hit wonders are a significant proportion of the observations, then we may find negative duration dependence for the full sample, as "young" organizations are much more likely to disappear from the data than "older" ones. If these observations are not significant, then we argue that positive duration dependence is the more reasonable prediction, for the same basic reasons that conventional firms also display positive duration dependence: discontinuity of management over time, technological obsolescence, product obsolescence, and so on. Second, we argue that for older organizations, excluding the "one-hit wonders," duration dependence will be positive but declining over time, meaning that over time several groups will begin to monopolize the production of transnational terrorism. Third, we argue that socio-economic characteristics of the target country will partly explain the probability that a terrorist organization can sustain attacks over time. In particular,

we argue that high-income countries are more likely to sustain attacks than lower-income countries and current violent actions by terrorist organizations is a strong indicator that the organization will likely operate next period.

II. Descriptive Data for Terrorist Organizations

This paper employs the newest release of the ITERATE data base, which extends through 2007. Begun as an attempt to quantify the characteristics and activities of transnational terrorist groups, the newest release of ITERATE provides a rich micro-level data set of over 16,000 incidents of terrorism across 152 countries from 1968 to 2007. One key aspect of the ITERATE data is its coding of event by date, location, estimated losses of life and property, victim characteristics, and the terrorist organization(s) that perpetrated it (to the extent it can be determined). Thus, ITERATE provides a panel-like format for tracing the activities of terrorist organizations over time, though we are limited in constructing "activities" to mean a terrorist event. The ITERATE project defines a terrorist event as follows:

> the use, or threat of use, of anxiety-inducing, extra-normal violence for political purposes by any individual or group, whether acting for or in opposition to established governmental authority, when such action is intended to influence the attitudes and behavior of a target group wider than the immediate victims and when, through the nationality or foreign ties of its perpetrators, its location, the nature of its institutional or human victims, or the mechanics of its resolution, its ramifications transcend national boundaries. (Mickolus and others 2002, p. 2).[3]

From the ITERATE observations, we construct the duration of transnational terrorist "firms."[4] We code each terrorist event as follows: $ATTACK_{i,j,t}$ takes the value one if terrorist organization *i* executes an attack in country *j* during year *t*; it takes a value of zero otherwise. More precisely, our model is estimating the probability that a terrorist organization that perpetrated a successful attack in period 1 survives to perpetrate an attack in a later period. Our approach means that a terrorist organization whose members still live and affiliate with the group but that does not attack has effectively "died out" from the ITERATE data. Duration dependence in this context specifically means the probability of staging a subsequent attack, given that the organization has staged at least one attack previously.

To the ITERATE data, we merge a set of country-year controls for economic and political conditions in the target country—the environment in which the terrorist organization is staging its attack. We take our economic controls from the updated Penn World Tables, based on the work by Summers and Heston (1991). We consider two baseline variables from that data set: total population and real GDP per capita (PPP-adjusted). Size of the total population offers a rough control for the potential size of the country's economy. Real GDP per capita offers a rough measure of the current level of development. Although Abadie (2006, p. 54) argues that "after controlling for other country characteristics … national income is not significantly associated with terrorism," his baseline (naïve) regressions reflect a strong positive association between real GDP per capita and terrorist activity. In short, he shows that real GDP per capita is an important control but that a country's level of economic development may depend on deeper determinants of economic performance, such as physical geography. We believe it is hard to draw useful and realistic policy options from a specification that employs physical geography as the primary drivers of cross-country economic performance. Rather, we elect to use real GDP

per capita but caution the reader to keep in mind that this may be a coarse measure of economic development. Not surprisingly, we find a fairly complex set of results on the role of national income in fostering the survival of terrorist organizations.

Our political data come from the *Polity IV Handbook* (Gurr, Jaggers, and Moore 2003). Specifically, we use its measure of democracy: our democracy variable (*DEM*) takes a value of one if the metric from Polity IV is greater than or equal to seven; it takes a value of zero otherwise. In keeping with Blomberg and Rosendorff (2009) and Blomberg and Hess (2009a, 2009b), we argue that democracy provides a set of rules that facilitates the peaceful resolution of political conflict. It lowers the costs of legitimate political actions, making illegal activities relatively more expensive. The theme of democratization has also become a dominant theme in U.S. foreign policy in recent years. For these reasons, we believe that the country's level of democracy is an important and policy-relevant explanatory variable, which also usefully proxies the civil liberties and political freedom metrics used in previous papers.

In addition to these economic and political controls, we include geographical dummy variables to control for spatial factors that may affect the ability of terrorist groups to sustain attacks. We also experiment with a broader set of controls suggested by previous research. These include various measures of societal fractionalization and more specific geographic dummies (such as elevation, country area, tropical area, and access to coast).[5] As mentioned previously, we would expect their inclusion to reduce the explanatory power of real GDP per capita and the democracy variable. As noted earlier, it would be ideal to use "firm"-level information on terrorist organizations, such as the size of the organization, to predict survivorship. Such information could include resources that the organization can muster, its recruitment base/size of constituency, the quality of its leadership, and its willingness to engage

in negotiations.[6] We are unable to provide such covariates in our analysis as there are no relevant data on group characteristics in the ITERATE database. Other notable databases do have some characteristics of group organizations but are not helpful for this particular exercise. For example, the Minorities at Risk (MAR) database collects data on the "status and conflicts of politically-active communal groups in all countries with a current population of at least 500,000."[7] However, the data base does not discriminate between terrorism and other forms of violence and therefore cannot be merged with our data. Moreover, the data base is constructed to highlight organizations that attack minority groups. This eliminates the possibility of examining those organizations that may attack strategically important targets such as many of those in the United States and Western Europe. Another example is the global terrorism database (GTD). However, these data define terrorism quite broadly and do not distinguish between what some might classify as crime and what others might classify as civil war. Hence, the ability to find a reliable source for individual terrorist organization data is limited. In the end, our data set contains over 16,000 events, reflecting the activities of 1,414 firms (terrorist organizations) between 1968 and 2007.

The basic summary statistics suggest a few broad conclusions, as well as several more subtle ones. First, we find mixed evidence regarding duration dependence. The adage that "most small businesses do not make it past the first year" seems to apply to terrorist enterprises as well. Figure 1 shows that over one-half of attacks are made by organizations that are active only once.[8] Hence, most organizations may be considered "one-hit wonders." Yet, we also find that among organizations that remain active in successive period the production of transnational terrorism is becoming increasingly monopolized by a small group of organizations. Figure 2 serves to reinforce this point. The figure depicts the absolute number of terrorist organizations on an

annual basis. The number of firms attacking in a given year has been in the hundreds, peaking around 1991 with 578 firms attacking. Since then, the number of active firms has fallen significantly to its low point of 52 firms in 2001. It had risen modestly to 89 firms by 2007, the latest available year.

To better appreciate the differences across the transnational terrorist organizations in the ITERATE data, Table 1 presents summary statistics for the 30 most active organizations from 1968 to 2007 and a set of socio-economic controls.[9] Column 1 lists the terrorist organization, Columns 2-7 list the percent of its attacks in democracies (*DEM*), high-income countries (*HIGHIN*), Middle Eastern and North African countries (*MENAFR*), sub-Saharan African countries (*SSA*), Latin America and the Caribbean countries (*LAT*), and East Asian countries (*EASIA*). Columns 8-11 report the total number of attacks (*ATT*), the total number of victims, those dead and injured, (*VIC*), average number of victims per attack (*VIC/ATT*), and the duration of each organization (*DUR*).[10] We think of these data as summarizing relevant features of the most productive transnational terrorist organizations operating during this period—a perverse sort of Fortune 500 list that we call the (Mis)Fortune 30. They are presented in descending order by total number of attacks.

One immediate impression from Table 1 is the sheer variety of organizations engaged in terrorist activities over the past forty years. Some are motivated by political ideologies, such as Marxism; some are motivated by separatist-nationalist causes; and still others are motivated by religious fundamentalism. The organizations comprising the (Mis)Fortune 30 include ones that operate primarily in Europe, such as the IRA and ETA; ones that operate primarily in the Middle East, such as Arab/Palestinian guerilla groups, Al Qaida, and Hezbollah; ones that operate

primarily in Africa, such as União Nacional para a Independência Total de Angola (UNITA) and Somali guerillas; and ones that operate primarily in Latin America, such as the FARC.[11]

Further, Table 1 shows that rich democracies are associated with relatively higher levels of terrorist activity, though the differences are fairly modest.[12] Ten of the twelve most active organizations have perpetrated the majority of their attacks in democratic regimes though the average difference over the entire sample is less striking. We can also see that eight of the most active groups have also targeted high-income countries. These findings suggest that for major transnational terrorist organizations the need to engage with free societies is a significant component of their strategy (perhaps for negotiation purposes, for greater international media attention, or for the potential gain in legitimacy among important constituencies at home and abroad). This finding may undermine the notion that democratization of itself will mitigate risk of terrorist activity, through greater capacity to resolve conflict peaceably.

Among the (Mis)Fortune 30, we also see from Table 1 that seven organizations (denoted in italics) were among those most active during the 2000s and among those most active during the entire sample.[13] In short, significant terrorist activity has been with us a long time; we just did not notice it so much until the attack of 9/11. The bottom row of Table 1 also compares the averages of the (Mis)Fortune 30 from the 1968-2007 period to the averages of the newer (Mis)Fortune 30 from the 2000-2007 period. As we compare the most recent crop of terrorist organizations with the full sample, we find less variation in the typologies of the organizations. Not surprisingly, Marxist and separatist political motivations appear less relevant than in the past. We observe an increase in religiously motivated or religiously tied organizations, many originating in the Middle East and the wider Muslim world. Table 1 also shows that attacks on rich democracies have fallen compared with previous time periods. In short, we find no simple

story about transnational terrorist activity: in recent years, democracies and high-income countries seem slightly less vulnerable than in the past but the motivation of transnational terrorism also appears to have shifted at the same time.

Table 1 shows one final empirical regularity: the most active organizations in the 2000s are far deadlier than their predecessors. The deadliness of attacks as measured by the average number of victims per attack (*VIC/ATT*) for the most active organizations averaged 19.4 in the most recent decade, compared with 3.6 for the entire time period. The violence of attacks (as measured by the average number of victims) has significantly increased each successive decade: the average annual number of victims increased from 952 in the 1990s to 1,457 during the 2000s. Unfortunately, without more detailed data on the modes of attack, sources of financial/logistic support, leadership structure, and available technologies, we have little ability to test for the possible causes of this increased lethality of transnational terrorism.

Finally, before proceeding to the empirical approach, it may be useful to note that a significant number of observations in ITERATE do not have an associated organization for the attack; they are coded as an "unknown" organization. To assess the extent to which dropping these observations may bias our results, we parsed the data by time, governance, region, and country income and compared the means of attacks and victims for known organizations to those for unknown organizations. Within each category, the general dynamics of the data for known and unknown organizations are similar. This suggests little bias in ignoring the unknown organizations in our analysis, as the independent variables tend to have similar relationships regardless of whether the organization is known or unknown.

III. Empirical Approach

We now apply a set of duration analysis techniques to our time-series data on transnational terrorist organizations. In this respect, our paper represents a departure from the literature's usual reliance on logit or probit models (see, for example, Blomberg, Hess, and Weerapana 2004). While the literature to date has offered insights into the relative importance of various factors in influencing attacks, it has several limitations. First, given the non-linear structure of the models, it is only possible to interpret the sign of the coefficients. In order to understand the "economic" meaning of the coefficient values, they must be scaled relative to the respective means and even then interpretations may not be direct. Second, and perhaps more important, such models cannot analyze the sustainability of a terrorist organization. That is, they cannot directly examine how likely an organization is to be active again, given that it has already attacked in a specified period of time.

Duration models have been developed to analyze these probabilities directly. This paper therefore uses them to estimate the probability of organizational survival and productivity from period to period after controlling for a set of economic and political factors. In the literature, a series is said to have *positive duration dependence* ($p>1$) if the probability that an entity will die (or exit a given state) in the current period increases with its lifespan. *Negative duration dependence* ($p<1$) is the opposite: the probability that an entity will die (or exit a given state) in the current period decreases with its lifespan.

We consider a variety of specifications for our duration model. In particular, we use four distributions for our hazard rate function, $\lambda(t)$: the exponential (which assumes a constant exit rate), the Weibull, the log-logistic, and the log-normal. Because we can show that the shapes of these distributions are similar, we employ the popular Weibull model for the main econometric

results. We then apply Weibull estimation to four variations of our basic political economy models of transnational terrorism and provide the results in Tables 2 and 3:

1) REGION MODEL: A model that includes controls for characteristics for the target country and its region: percent of attacks in sub-Saharan Africa (*SSAFR*), Latin American and the Caribbean (*LAT*), East Asia (*EASIA*), Middle East and North Africa (*MENAFR*), North America (*NAMER*), Oceania (*OCEAN*), democracies (*DEM*), landlocked countries (*LANDLOCK*), and percent of ethnolinguistic fractionalization (*ETHFRAC*).
2) INCOME MODEL: A model that includes controls for the target country's income level (log of GDP per capita (*LN(GDP/POP)*) and log of population (*LN(POP)*).
3) VIOLENCE MODEL: A model that includes controls for a terrorist organization's violence: the number of attacks (*ATT*), the number of victims (*VIC*), and the Herfindahl index (*HHI*). The latter measures the concentration of violence as calculated as the sum of the square of the percentage of victims by each organization with at least four attacks. A relatively high HHI indicates that a few organizations are dominating the production of violence. [14]
4) FULL MODEL: An integration of models 1-3.

These four models are included to represent several theories of what drives terrorist organizations, which may be best encapsulated in Crenshaw (1981) as modernization, "social facilitation," and the spread of revolutionary ideologies. If modernization is a contributing factor to the duration of terrorist organizations, then one might expect that technological processes that create income dispersion may encourage terrorist organizations to strike in richer more and more populated areas (INCOME MODEL). If social facilitation is a contributing factor, then an increasing concentration of terrorist activity in the hands of a few organizations and the severity

of violence may be more important to increasing the duration of terrorist organizations (VIOLENCE MODEL). If nationalist or religious goals are important in the duration of terrorist organizations, then one might expect regional and institutional factors to be important (REGION MODEL).

Our central hypotheses are therefore:

H1: Terrorist organization's survivorship increases with population and income in targeted countries.

H2: Terrorist organization's survivorship increases with the severity of violence of attacks.

H3: Terrorist organization's survivorship increases in regions and regimes with more fragile counter-insurgency institutions.

We find that differences in income, violence, democracy, and geography go a long way into explaining the duration of terrorist organizations.

We estimate these models over the entire sample from 1968 to 2007 and over the last part of the sample from 1991 to 2007. The rationale for analyzing the results using only the 1991-2007 period is our crude attempt to control for various factors that have been more pronounced during the second part of the time sample. These factors include the end of the Cold War, which many argue marked a significant watershed in terrorist organization. (The post-Cold War period has about 40 percent of the terrorism seen in the 1980s.) Another reason to consider splitting the sample is the possible influence of an outlier like al-Qaida, which began operations in 1995 and most notably participated in the attacks on September 11th.[15]

IV. Results

We now turn to the estimation of the hazard rates, λ, which we use to interpret whether the population of transnational terrorist organizations exhibits positive or negative duration dependence. For example, a hazard rate of 0.20 can be interpreted to mean that, on average, a terrorist organization has a 20 percent chance of ceasing operations in a future period. We also present the parametric estimates of how socio-economic and political factors impact the hazard rate, λ . For clarity, we will present our results from this exercise as marginal effects, in which we analyze the incremental effects of these variables on the median duration of a transnational terrorist organization. For example, if the coefficient on *MENAFR* (the Middle East and North Africa regional dummy) were 0.25, then a terrorist organization that stages an attack in the region will continue to operate 0.25 years longer than the median organization.

Our analysis yields four main results. First, in the basic model that includes "one-hit wonders," we find evidence of negative duration dependence: the longer an organization is alive (active), the more likely it will survive to the next year. Second, socio-economic, political, and geographic variables—such as real GDP per capita, size of population, and regional dummies—are important in explaining the hazard rate. Third, we find that an organization's level of violence raises its probability of surviving to the next year (has a positive effect on the hazard rate) and that this effect may have become more pronounced since 1990. (This effect is more robust when considering violence as measured by the number of attacks than when measured by the number of victims.) Fourth, when we consider only recidivist organizations and include relevant covariates, we find substantial evidence of positive duration dependence: the longer an organization is alive (active), the less likely it will survive to the next year. This suggests that socio-economic and political factors may play an important role in limiting the sustainability of recidivists. The rest of this section elaborates on these basic findings.

We begin by presenting the estimates from our baseline hazard model using the full sample of organizations. As noted earlier, we consider four specifications: exponential, Weibull, log-logistic, and log-normal. We do not, at the start, allow for covariate effects. The hazard rates and the *p* values are estimated from all four models, and we find that they are quite similar. With the exception of the exponential case, in which *p* equals one by construction, each model yields *p* estimates that are less than one – consistent evidence of negative duration dependence. The implication of such an estimate is that for the full universe of terrorist organizations the longer a terrorist organization has been active, the more likely it is to survive to the next period.

Figure 3 plots the predicted hazard rates for the four specifications by year. In the three cases where the model is allowed to have duration dependence, we find a strongly negative slope. Notably, the rate of decay is remarkable in the first year. This confirms the preliminary analysis that showed that many organizations cease after one attack. Thus, we find the highest exit rate in the first year(s), a fact that seems to drive the negative duration dependence found for the full sample. Moreover, the median duration is estimated to be between 1.7 to 3 years, and the median lifespan of the average terrorist organization is quite short-lived. (We look more closely at recidivists in a set of robustness checks.) The relatively similar shapes of the three curves imply that our choice of functional form is not driving these results.[16]

We now investigate the extent to which the underlying socio-economic and political factors of the target country affect the duration of terrorist organizations. Table 2 reports the results when we take the hazard rates as the dependent variable and use time-varying covariates to explain them. All of the results are reported as the marginal effects of an increase in the independent variable on the median duration of a terrorist organization.

One result shown in Table 2 is that there appears to be negative duration dependence in the data even after controlling for socio-economic and political factors for many of the models. Note the estimates of *p*, found at the bottom of each column, are below one in the majority of the cases and are statistically significantly different from one in the first several columns. This result means that if an organization is active in a given period, it is likely to remain active in the next period even after controlling for its surrounding conditions. In short, policy that addresses socio-economic factors alone may not be highly effective in cutting down on the emergence of one-hit wonders.

Table 2 also shows that regional factors affect the durability of a transnational terrorist organization. Column 1 shows that organizations operating in sub-Saharan Africa are more likely to survive than those operating in North America. For the years 1968 through 2007, Table 2 shows that an organization operating in sub-Saharan Africa is likely to survive 0.6 years longer than the median organization; an organization operating in North America is likely to survive 0.4 years less than the median (though it is statistically insignificant). When all the controls are included as in Column 4, these effects strengthen to +2.7 years for firms operating in Africa and -1.3 years for firms operating in North America. These effects appear to be more fragile for the second half of the sample period.

Next, the table shows that, for the full sample, transnational terrorist organizations operating in higher income countries are more likely to survive than the median organization. In this case, a ten percentage point increase in real GDP per capita causes the lifespan of an organization to increase by 0.3 years, or 4 months. Also, terrorist organizations operating in more highly populated countries are more likely to survive than the median organization. A ten percentage point increase in total population causes the lifespan of an organization to increase by

0.2 years, or roughly 2 months. Column 4 shows that the population and income results are robust to the inclusion of other covariates. These effects appear to have become even stronger in the second half of the sample period (1991-2007).[17]

Finally, the level of violence perpetrated by an organization—as shown in Column 3—suggests that success breeds survival. Those organizations that execute more violence have lived longer than the median organization. Some of these effects are not as statistically significant, however, for the more recent sub-period when all the covariates are included.

These results point to a nuanced interpretation of the determinants of terrorism. While operations in richer and more populous areas appear to increase survivorship, we find a relatively small impact (about two to four months for a large increase in population or income). Moreover, even though operations in some regions appear to offer higher survivorship (sub-Saharan Africa versus United States, for example), none of these factors appears to be a driving force in determining the direction of duration dependence. In each case, the models, when estimated using the full sample, demonstrate some evidence of negative duration dependence, even after these mitigating factors have been included. One interpretation is that its choice of operational environment can affect the longevity of a transnational terrorist organization, but not much. In short, many of factors discussed in Crenshaw (1981) appear to be important in determining the duration and sustainability of terrorist organizations. However, the magnitudes associated with some of these factors are not particularly notable.

Table 3 repeats the same exercises as those found in Table 2 for recidivists, or repeat offenders, only. By construction, this step reduces the sample size and increases the degree of positive duration dependence. Still, it is useful to see the extent to which these covariates affect the more durable organizations. Interestingly, the impacts shown in Table 3 continue to show

the same results associated with these socio-economic and political factors. The main difference in this case is that the median duration is roughly twice as long (5.2 to 7.3 years) and positive duration dependence clearly emerges. In all eight columns in Table 3, *p* is estimated to be statistically significantly greater than one. Among the organizations that survive to perpetrate a second attack, the older a "firm" the more likely it is to die in the next period.

Table 3 also includes a final column that estimates the model including fixed effect estimates for organization and year. Not surprisingly, many of the coefficients associated with dummy variables become statistically insignificant, but the main result that income and violence have positive impacts on duration continues to hold. We interpret this result as confirmation that individual terrorist organization impacts do not "wash out" the impacts suggested in political economic theory.

As a set of final robustness checks, Tables 4 and 5 report the results from estimating the Weibull model with an alternative definition of duration. In this case, we consider only the impact of violent attacks (or those attacks in which there are victims). This means that we are investigating the likelihood of sustaining violent attacks (or ones in which there are victims) given that there was a violent attack (or an attack with victims) last period by that organization. This cuts the sample size in roughly half. The results are qualitatively similar to those found in Tables 2 and 3 suggesting that alternative definitions of activity do not drive the results.

The format of Tables 4 and 5 is the same as in Tables 2 and 3; many of the results also mirror each other. Regions, such as sub-Saharan Africa and North America, have similar impacts on median duration of violence. Income and population also affect the median duration of violence, though there is less precision in the estimates. Violence continues to be a factor, particularly in the number of attacks, and the concentration of organizations continues to impact

duration. These results provide some robustness checks on the earlier findings and support the results found in Tables 2 and 3.

Before leaving the empirical section of the paper, we conduct one more exercise. Instead of just interpreting the sign of the coefficients, it may be interesting to look at the actual predicted duration of years of activity from the models and examine the extent to which the features examined here can generate the differences in observed duration distributions. Table 6 provides the median duration of organizations and compares it to the predicted duration from the Weibull model (column 8 of Table 3). Table 6 presents the results by parsing the data by time, governance, region and income and compares the results for all organizations and recidivist organizations. Table 6 shows that the general dynamics of the data for all organizations and for recidivists alone are similar. In both cases, duration increased during the 1980s and 1990s. When we compare differences by governance, geography, and income, we see similar empirical regularities across both types of organizations. It is interesting to compare these actual durations to the model's predictions based on our estimated equation. Table 6 shows that the predicted values appear to be relatively closer to the actual duration when we consider recidivist organizations only (column 5) rather than when we consider all organizations (column 3). This confirms our earlier finding that suggests these political economic theories have greater explanatory power when analyzing recidivists than one-hit wonders.

Our empirical results reveal two different types of terrorist organizations – recidivists and one-hit wonders. Several of the socio-economic factors significantly impact the duration dependence for recidivists, implying that policy actions may be able to reduce the durability of established organizations. However, these factors are less important for explaining the duration dependence for one-hit wonders, and different factors may be driving these types of

organizations. In short, terrorist organizations appear to be born for many diverse reasons, but once established they do predictably obsolesce over time.

V. Conclusions

Our paper employs the most recently released version of the ITERATE data set to explore the duration of terrorist organizations. Using basic statistical analysis and models of duration, we uncover several interesting empirical findings regarding terrorist activities. We find that there are at least two types of terrorist organizations – recidivists and one-hit wonders. We find that terrorism is becoming increasingly monopolized by a smaller set of organizations and these organizations are more deadly than their predecessors. We also find that regional, socio-economic, and political factors affect these organizations' survival. However, these factors do not significantly affect the direction of duration dependence. We interpret this to mean that there may be other factors, such as counter-terrorist measures, that may better decrease the durability of terrorist organizations. This would be an important avenue to consider for future research.

As research continues in this area, we offer a few caveats based on our findings here. First, our results rely on ITERATE data, which only include transnational terrorism. It is possible that the results would differ if one conducted similar exercises using the Global Terrorism Database, for example, to see if the inclusion of domestic events, and possibly crime, change our story. We hope to take this step in upcoming research. In addition, we consider only broad macro-level variables of socio-economic environment but variables that capture counter-terrorism policy directly are likely to be important as well. In this paper, we can only speculate about such determinants.

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[1] Analysis of duration dependence has focused on several major economics questions. Lancaster (1979) applied these techniques to estimating the probability of leaving an unemployment state, for example. Kiefer (1988) offers an excellent survey of early work on economic duration data and hazard functions.

[2] Cronin (2006) and Jones and Libicki (2008) provide a more recent treatment of how certain organizations, such as al-Qaida, conduct their activities, but they offer little quantitative analysis.

[3]Hence, events such as September 11, 2001 are included in ITERATE but other events, such as the Oklahoma City bombing, are not.

[4] The ITERATE data do not include detailed characteristics on the terrorist groups themselves, such as structure of leadership, modes of attack and available technologies, location of safe havens, sources of financial support, and so on. All these factors would have considerable theoretical and practical importance for the duration of a transnational terrorist organization. Unfortunately, with the ITERATE data, we are limited in our capacity to test specific hypotheses linking probability of survival with organizational characteristics. In future work, we hope to develop a fuller, more detailed data set to test causal relationships more carefully.

[5] Abadie (2006) shows that more specific geographic controls, such as country area, elevation, and tropical area, reduce the explanatory power of real GDP per capita in cross-country regressions. Still the issues associated with multicollinearity do not diminish the usefulness of considering each factor's independent impact on terrorism.

[6] We thank an anonymous referee and Paul Huth for this suggestion.

[7] See http://www.cidcm.umd.edu/mar/

[8]As our paper is interested in examining the life-cycle of terrorist organizations, it may be argued that one should consider only organizations that are found to be active more than once in the sample. However, dropping such a large set of observations may bias the results. Instead we consider only repeat offenders and find that many of the results continue to hold. We consider this possibility in our sensitivity analysis using the time-varying covariates model.

[9]We are considering only those organizations that are known to be terrorist groups. The designation most often found in the data is that the group is "unknown." This category accounts for 35 percent of the sample. We test for the significance of these missing data and find no significant difference across socio-economic factors.

[10]If an organization strikes in a given year we assume that it is active. If it strikes in a given year and then is dormant for x years and strikes in year x+1, we assume that it was active throughout the time period only if x is less than or equal to 2. It turns out that this assumption is not terribly restrictive. The results are not sensitive to the choice of x as few organizations remain dormant for a significant period of time.

[11] Table 1 shows fewer victims associated with al-Qaida than is often reported because ITERATE does not report the exact number when the number is unknown. If these additional approximately 2,600 victims were included, then al-Qaida would be shown to be the most deadly organization in the sample.

[12]For the entire sample, the average number of attacks by firms is larger for democracies (31 versus 28), larger for high and middle income countries (30 and 31 versus 28), and largest for Latin America (33) and Other Regions (31). The latter includes Europe and North America. These results are consistent with what has been found in the literature, though the trend has modified somewhat since 2001 (see Blomberg and Hess 2009a,b and Enders and Sandler 2006).

[13] Some of these seven groups, including al-Qaida, were mainly active during the 1990s and 2000s.

[14] The Herfindahl index, also known as Herfindahl-Hirschman Index (HHI), is a measure of the size of firms in relation to the industry and an indicator of the amount of competition among them. It is defined as the sum of the squares of the market shares of the *n* largest firms. In our case, we are measuring size by the number of victims associated with each firm. We set *n* equal to four, but the results are not sensitive to such a transformation**.**

[15]Removing al-Qaida or similar organizations from the regression analysis does not impact any of the qualitative results presented in Tables 2 and 3.

[16] There may be some concern that employing a parametric model, such as the Weibull model, may be too restrictive. To investigate this question, we also estimate Kaplan-Meier survival functions for all organizations and for all recidivist organizations. We found that the shapes of these functions are monotonic with respect to time, so assuming a Weibull distribution is unlikely to bias the results. Moreover, this allows us to employ the parametric model so that we can analyze the impact of socio-economic and political factors on the hazard rate and calculate the marginal impact on median duration of survivorship.

[17]Though not reported, the χ^2 test of significance of the independent variables is not rejected in each case. For example, the χ^2 test statistic is 31.99 with an associated p-value of 0.0001 for the first regression.

Table 1: (Mis)Fortune 500: Descriptive Statististics of Terrorist Organizations 1968-2007

ORG	DEM	HIGHIN	MENAFR	SSA	LAT	EASIA	ATT	VIC	VIC/ATT	DUR
Irish Republican Army (IRA)	0.99	1.00	0.01	0.00	0.00	0.00	563	2422	4.3	31
Arab/Palestinian guerillas	0.64	0.63	0.59	0.01	0.01	0.03	282	946	3.35	40
Euskadi Ta Askatasuna (ETA)	0.91	0.97	0.00	0.01	0.02	0.00	152	185	1.22	38
Black September Organization (BSO)	0.31	0.81	0.15	0.01	0.00	0.06	151	257	1.7	18
Islamic Jihad Organization	0.25	0.20	0.74	0.01	0.01	0.04	135	1410	10.44	25
Colombian guerrillas	0.99	0.01	0.00	0.00	0.99	0.00	127	36	0.28	38
German rightwing guerillas	1.00	1.00	0.00	0.00	0.00	0.00	125	83	0.66	9
Ejército de Liberación Nacional (ELN)	1.00	0.00	0.00	0.00	1.00	0.00	118	431	3.65	36
Parti Karkerani Kurdistan (PKK)	0.96	0.90	0.01	0.00	0.00	0.00	104	52	0.5	11
Fuerzas Armadas de Liberación Nacional (FALN)	0.93	0.90	0.00	0.00	0.10	0.00	100	183	1.83	17
Popular Front for the Liberation of Palestine (PFLP)	0.64	0.71	0.57	0.02	0.00	0.02	99	696	7.03	29
Sendero Luminoso	0.92	0.00	0.00	0.00	1.00	0.00	91	175	1.92	24
Somalian guerrillas	0.00	0.00	0.00	1.00	0.00	0.00	91	158	1.74	28
Armenian Secret Army for the Liberation of Armenia	0.66	0.64	0.35	0.00	0.00	0.00	80	188	2.35	19
Communist Party of the Philippines-New People's Army	0.96	0.00	0.00	0.00	0.00	1.00	77	209	2.71	22
Corsican National Liberation Front	1.00	1.00	0.00	0.00	0.00	0.00	72	15	0.21	13
Yugoslav/Croatian/Serb guerillas	0.57	0.68	0.00	0.00	0.02	0.13	70	140	2	40
Fuerzas Armadas Revolucionarias de Colombia (FARC)	1.00	0.00	0.00	0.00	1.00	0.00	67	55	0.82	29
Khmer Rouge	0.03	0.00	0.00	0.00	0.00	1.00	66	376	5.7	7
União Nacional para a Independência Total de Angola	0.15	0.00	0.00	1.00	0.00	0.00	66	647	9.8	25
Epanastatikos Laikos Agonas (ELA)	1.00	1.00	0.98	0.00	0.00	0.00	61	5	0.08	19
al-Qaida	0.38	0.22	0.36	0.05	0.02	0.03	60	1292	21.53	12
Hezbollah	0.31	0.24	0.75	0.02	0.05	0.00	59	486	8.24	19
FatahRevolutionary Council	0.56	0.60	0.60	0.00	0.02	0.00	56	288	5.14	18
National Resistence Movement (NRM)	0.00	0.00	0.00	1.00	0.00	0.00	54	214	3.96	12
BaaderMeinhof Group	0.92	1.00	0.00	0.00	0.00	0.02	53	111	2.09	20
Movimiento Revolucionario Tupac Amaru (MRTA)	0.94	0.00	0.00	0.00	1.00	0.00	51	52	1.02	13
Ejercito Revolucionario del Pueblo (ERP)	0.56	0.00	0.00	0.00	1.00	0.00	50	12	0.24	6
Jewish Defense League	0.96	0.98	0.06	0.00	0.02	0.00	50	35	0.7	20
MalayArab group	0.00	0.00	0.00	0.00	0.00	1.00	44	0	0	1
Mean for (mis)fortune30 1968-2007	0.65	0.44	0.17	0.10	0.22	0.11	104.3	371.19	3.58	21.58
Mean for (mis)fortune30 2000-2007	0.45	0.23	0.32	0.14	0.12	0.10	12.47	203.13	19.41	4.25

Notes: Column 1 reports the name of the 30 highest incidence of attack organizations, Columns 2,3 report the percent of of attacks by each organization in democracies (DEM) and highincome countries (HIGHIN). Democracy is defined as a Polity IV score>7. Income groups as defined by the World Bank. Columns 4-6 report the percent of attacks in East Asia (EASIA), Latin America and Caribbean (LAT), Middle East and North Africa (MENAFR) and Sub-Sahara Africa (SSA). Column 7 reports the total number of attacks for the organization and Column 8 reports the total number of victims (wounded+killed) for each organization. Column 9 reports the ratio of victims per attack and Column 10 reports the total number of years that the organization exists. Organizations in italics are those that continue to be in the top 30 from 2000-2007

Table 2: Estimating Impact of Temporal, Socio-Economic and Political Indicators
TVC Weibull Model, Marginal Effects on Median Duration Reported

	1968-2007				1991-2007			
	REGION	INCOME	VIOLENCE	ALL	REGION	INCOME	VIOLENCE	ALL
SSAFR	0.579**			2.729***	-3.426***			1.092
	[0.288]			[0.425]	[0.866]			[1.099]
LAT	0.262			1.552***	-0.497			2.345***
	[0.196]			[0.238]	[0.607]			[0.657]
EASIA	0.165			0.817**	-1.452*			0.681
	[0.319]			[0.333]	[0.811]			[0.850]
MENAFR	0.795***			1.723***	-2.974***			-0.39
	[0.239]			[0.256]	[0.770]			[0.782]
NAMER	-0.425			-1.327***	3.17			1.006
	[0.343]			[0.389]	[2.716]			[2.464]
OCEAN	-0.466			0.327	-3.870***			-1.348
	[0.350]			[0.392]	[0.827]			[0.924]
DEM	0.716***			0.287	-0.822			-1.867***
	[0.178]			[0.180]	[0.560]			[0.566]
ETHFRAC	0.002			0.004	-0.01			-0.006
	[0.004]			[0.004]	[0.008]			[0.008]
LANDLOCK	-1.176***			-0.912***	-2.252***			-1.906***
	[0.270]			[0.280]	[0.673]			[0.644]
LN(POP)		0.207***		0.379***		0.356**		0.599***
		[0.051]		[0.076]		[0.140]		[0.185]
LN(GDP/N)		0.348***		0.847***		1.446***		1.732***
		[0.061]		[0.126]		[0.166]		[0.305]
ATTACKS			4.564***	3.440***			11.908***	7.243***
			[0.835]	[0.587]			[3.124]	[1.911]
VICTIMS			0.484***	0.444***			-0.013	0.146
			[0.156]	[0.141]			[0.270]	[0.250]
HHI			1.561***	0.616			4.688***	4.304***
			[0.483]	[0.517]			[0.893]	[0.929]
OBS	2620	2717	3060	2572	727	792	933	694
p	0.96	0.97	0.98	1.03	0.97	1.01	0.97	1.11
s.e. of p	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
med	2.785	2.777	2.726	2.793	4.478	4.342	4.215	4.579

Notes: robust standard errors are reported in parenteses. *,**,*** denote significance at the 0.10,0.05,0.01 level. Each column reports the marginal effects calculated from weibull model. Column (1) includes the percentage of attacks for regions in East Asia (EASIA), Latin America and Caribbean (LATCA), Oceana (OCEAN), North America (NAMER) Middle East and North Africa (MENAF), Sub-Sahara Africa (SSAFR) in the regression. Also included is the % of democracies (DEM), Landlocked (LANDLOCK), and ethnoling frac (ETHFRAC). Column (2) includes the log of the population (LN(POP)) and real GDP per capita (LN(GDP/N)) in the regression. Column (3) includes the average number of attacks (ATTACKS), the number of victims (VICTIMS) and the herfindahl index of violence (HHI) calculated as the sum of the square of the percentage of victims by each organization with at least 4 attacks. Column (4) includes all of the covariates from Columns 1-3. Columns 5-8 provide the results from analogous regressions as in Columns 1-4 except restricts the estimation from the years 1991-2007. The number of observations (obs), the probability of duration dependence (p) and the median duration (med) are reported in the bottom panel.

Table 3: Estimating Impact of Temporal, Socio-Economic and Political Indicators
TVC Weibull Model, Marginal Effects on Median Duration Reported for Recidivists

	1968-2007				1991-2007				
	REGION	INCOME	VIOLENCE	ALL	REGION	INCOME	VIOLENCE	ALL	ALL,F.E.
SSAFR	-0.739			3.535***	-6.610***			1.085	1.029
	[0.547]			[0.829]	[1.282]			[1.610]	[0.692]
LAT	-0.718*			1.748***	-1.705*			2.455***	0.004
	[0.377]			[0.464]	[0.888]			[0.924]	[0.504]
EASIA	-0.64			0.621	-3.314***			0.01	0.347
	[0.642]			[0.666]	[1.173]			[1.221]	[0.362]
MENAFR	0.317			2.001***	-3.744***			-0.525	-0.034
	[0.473]			[0.496]	[1.142]			[1.127]	[0.381]
NAMER	-0.332			-2.114**	9.328**			4.703	-1.021**
	[0.719]			[0.836]	[4.152]			[2.869]	[0.490]
OCEAN	-1.810***			-0.348	-7.013***			-2.815**	-0.485
	[0.662]			[0.739]	[1.211]			[1.324]	[0.625]
DEM	0.394			-0.183	-1.947**			-2.699***	-0.011
	[0.363]			[0.348]	[0.854]			[0.814]	[0.205]
ETHFRAC	-0.006			0.001	-0.01			-0.006	-0.002
	[0.007]			[0.007]	[0.012]			[0.011]	[0.004]
LANDLOCK	-2.133***			-1.871***	-3.305***			-2.958***	0.13
	[0.536]			[0.554]	[1.010]			[0.936]	[0.248]
LN(POP)		0.392***		0.713***		0.450**		0.933***	0.066
		[0.099]		[0.147]		[0.214]		[0.274]	[0.070]
LN(GDP/N)		0.915***		1.589***		2.348***		2.608***	0.215**
		[0.114]		[0.244]		[0.246]		[0.446]	[0.109]
ATTACKS			4.346***	3.147***			11.913***	7.115***	0.773***
			[0.814]	[0.606]			[3.277]	[1.863]	[0.255]
VICTIMS			0.720***	0.508**			0.28	0.221	-0.065
			[0.235]	[0.208]			[0.367]	[0.307]	[0.066]
HHI			3.400***	1.968**			5.623***	5.363***	
			[0.908]	[0.916]			[1.369]	[1.233]	
OBS	1503	1556	1727	1483	518	562	655	505	
p	1.25	1.28	1.27	1.36	1.3	1.34	1.24	1.5	
s.e. of p	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.04	
med	5.301	5.264	5.26	5.297	7.349	7.086	7.014	7.311	

Notes: robust standard errors are reported in parenteses. *,**,*** denote significance at the 0.10,0.05,0.01 level. Each column reports the marginal effects calculated from weibull model. Column (1) includes the percentage of attacks for regions in East Asia (EASIA), Latin America and Caribbean (LATCA), Oceana (OCEAN), North America (NAMER) Middle East and North Africa (MENAF), Sub-Sahara Africa (SSAFR) in the regression. Also included is the % of democracies (DEM), Landlocked (LANDLOCK), and ethnoling frac (ETHFRAC). Column (2) includes the log of the population (LN(POP)) and real GDP per capita (LN(GDP/N)) in the regression. Column (3) includes the average number of attacks (ATTACKS), the number of victims (VICTIMS) and the herfindahl index of violence (HHI) calculated as the sum of the square of the percentage of victims by each organization with at least 4 attacks. Column (4) includes all of the covariates from Columns 1-3. Columns 5-9 provide the results from analogous regressions as in Columns 1-4 except restricts the estimation from the years 1991-2007. Column (9) includes firm and time dummy variables. The number of observations (obs), the probability of duration dependence (p) and the median duration (med) are reported in the bottom panel.

Table 4: Estimating Impact of Temporal, Socio-Economic and Political Indicators
TVC Weibull Model, Marginal Effects on Median Duration of Violent Attack Reported

	1968-2007				1991-2007			
	REGION	INCOME	VIOLENCE	ALL	REGION	INCOME	VIOLENCE	ALL
SSAFR	0.424			4.144***	-6.400***			-1.322
	[0.503]			[0.753]	[1.658]			[1.990]
LAT	0.484			2.727***	-0.086			2.866***
	[0.343]			[0.410]	[1.069]			[1.110]
EASIA	0.049			1.099*	-3.390**			-0.911
	[0.588]			[0.613]	[1.502]			[1.570]
MENAFR	0.676			2.292***	-4.029***			-1.79
	[0.429]			[0.414]	[1.395]			[1.410]
NAMER	-0.354			-2.259***	7.596			2.332
	[0.659]			[0.649]	[7.658]			[5.925]
OCEAN	-0.795			0.544	-7.087***			-3.690**
	[0.588]			[0.697]	[1.493]			[1.518]
DEM	0.653**			0.013	-1.847*			-3.174***
	[0.316]			[0.299]	[1.000]			[1.026]
ETHFRAC	-0.006			-0.001	-0.019			-0.014
	[0.006]			[0.006]	[0.015]			[0.014]
LANDLOCK	-1.989***			-1.545***	-2.638*			-2.739**
	[0.454]			[0.411]	[1.347]			[1.119]
LN(POP)		0.399***		0.779***		0.291		0.358
		[0.093]		[0.108]		[0.264]		[0.313]
LN(GDP/N)		0.712***		1.394***		2.543***		2.331***
		[0.108]		[0.237]		[0.315]		[0.577]
ATTACKS			4.564***	3.204***			11.849***	7.284***
			[0.756]	[0.533]			[3.071]	[1.972]
VICTIMS			0.321*	0.287*			-0.213	-0.029
			[0.174]	[0.156]			[0.323]	[0.337]
HHI			2.137***	1.003			4.434***	5.181***
			[0.798]	[0.809]			[1.452]	[1.572]
OBS	1276	1326	1493	1251	364	393	493	346
p	0.97	0.99	0.99	1.07	1.07	1.11	0.99	1.23
s.e. of p	0.01	0.01	0.01	0.01	0.03	0.03	0.02	0.04
med	3.522	3.488	3.417	3.526	6.063	5.811	5.42	6.209

Notes: robust standard errors are reported in parenteses. *,**,*** denote significance at the 0.10,0.05,0.01 level. Each column reports the marginal effects calculated from weibull model. Column (1) includes the percentage of attacks for regions in East Asia (EASIA), Latin America and Caribbean (LATCA), Oceana (OCEAN), North America (NAMER) Middle East and North Africa (MENAF), Sub-Sahara Africa (SSAFR) in the regression. Also included is the % of democracies (DEM), Landlocked (LANDLOCK), and ethnoling frac (ETHFRAC). Column (2) includes the log of the population (LN(POP)) and real GDP per capita (LN(GDP/N)) in the regression. Column (3) includes the average number of attacks (ATTACKS), the number of victims (VICTIMS) and the herfindahl index of violence (HHI) calculated as the sum of the square of the percentage of victims by each organization with at least 4 attacks. Column (4) includes all of the covariates from Columns 1-3. Columns 5-8 provide the results from analogous regressions as in Columns 1-4 except restricts the estimation from the years 1991-2007. The number of observations (obs), the probability of duration dependence (p) and the median duration (med) are reported in the bottom panel.

Table 5: Estimating Impact of Temporal, Socio-Economic and Political Indicators
TVC Weibull Model, Marginal Effects on Median Duration Reported for Violent Recidivists

	1968-2007				1991-2007			
	REGION	INCOME	VIOLENCE	ALL	REGION	INCOME	VIOLENCE	ALL
SSAFR	-1.213			4.777***	-10.586***			-1.553
	[0.846]			[1.231]	[2.078]			[2.364]
LAT	-1.031*			2.626***	-2.21			2.303*
	[0.569]			[0.683]	[1.382]			[1.324]
EASIA	-1.315			0.207	-6.379***			-2.307
	[0.987]			[1.027]	[1.881]			[1.880]
MENAFR	-0.023			2.604***	-5.467***			-2.663
	[0.738]			[0.701]	[1.788]			[1.743]
NAMER	-0.692			-3.933***	11.544			2.438
	[1.089]			[1.039]	[9.172]			[6.120]
OCEAN	-2.134**			-0.238	-11.329***			-5.857***
	[0.954]			[1.112]	[1.845]			[1.783]
DEM	0.528			-0.163	-3.192**			-4.230***
	[0.545]			[0.484]	[1.333]			[1.275]
ETHFRAC	-0.015			-0.005	-0.009			-0.006
	[0.011]			[0.010]	[0.020]			[0.017]
LANDLOCK	-2.816***			-2.326***	-3.114*			-3.052**
	[0.793]			[0.642]	[1.751]			[1.249]
LN(POP)		0.686***		1.344***		0.501		0.782*
		[0.153]		[0.182]		[0.344]		[0.406]
LN(GDP/N)		1.363***		2.050***		3.437***		3.435***
		[0.171]		[0.377]		[0.391]		[0.691]
ATTACKS			4.240***	2.812***			11.270***	6.464***
			[0.791]	[0.597]			[3.109]	[1.765]
VICTIMS			0.596**	0.387*			0.162	0.141
			[0.250]	[0.227]			[0.399]	[0.360]
HHI			3.809***	2.277*			4.798**	5.655***
			[1.309]	[1.288]			[2.032]	[1.907]
OBS	855	885	986	843	293	315	384	285
p	1.24	1.29	1.24	1.39	1.38	1.41	1.23	1.59
s.e. of p	0.02	0.02	0.02	0.02	0.04	0.05	0.03	0.06
med	5.906	5.825	5.815	5.889	8.614	8.223	8.044	8.523

Notes: robust standard errors are reported in parenteses. *,**,*** denote significance at the 0.10,0.05,0.01 level. Each column reports the marginal effects calculated from weibull model. Column (1) includes the percentage of attacks for regions in East Asia (EASIA), Latin America and Caribbean (LATCA), Oceana (OCEAN), North America (NAMER) Middle East and North Africa (MENAF), Sub-Sahara Africa (SSAFR) in the regression. Also included is the % of democracies (DEM), Landlocked (LANDLOCK), and ethnoling frac (ETHFRAC). Column (2) includes the log of the population (LN(POP)) and real GDP per capita (LN(GDP/N)) in the regression. Column (3) includes the average number of attacks (ATTACKS), the number of victims (VICTIMS) and the herfindahl index of violence (HHI) calculated as the sum of the square of the percentage of victims by each organization with at least 4 attacks. Column (4) includes all of the covariates from Columns 1-3. Columns 5-8 provide the results from analogous regressions as in Columns 1-4 except restricts the estimation from the years 1991-2007. The number of observations (obs), the probability of duration dependence (p) and the median duration (med) are reported in the bottom panel.

Table 6: Median Duration and Predicted Median Duration Using Weibull Model

	All Organizations		Recidivists	
	Median Duration	Est. Median Duration	Median Duration	Est. Median Duration
1970s	1.0	2.7	3.0	5.4
1980s	2.0	2.7	4.0	5.2
1990s	3.0	2.8	6.0	5.0
2000s	1.0	3.3	6.0	5.9
ssafr	2.0	2.4	4.0	4.0
menaf	1.0	3.0	4.0	5.5
latca	2.0	2.7	4.0	4.9
easia	2.0	2.7	4.0	4.8
Democratic	2.0	2.8	4.0	5.3
Non-Democratic	1.0	2.3	4.0	4.3
High Income	2.0	2.8	4.0	5.7
Low Income	1.0	2.1	3.0	3.7
All	2.0	2.8	4.0	5.3

Notes: Column 1 reports the median duration for terrorist organizations and column 2 reports the estimated median duration for terrorist organizations using weibull model. Columns 3,4 report the median duration and estimated duration for only recidivists. Row 1-4 report these numbers over each successive decade. Rows 5-8 report the results for regions in East Asia (EASIA), Latin America and Caribbean (LATCA) Middle East and North Africa (MENAF), and Sub-Sahara Africa (SSAFR). Rows 9-10 report the results for Non-Democratic and Democratic Regimes (Democracy is defined as a Polity IV score>7). Rows 11-12 report the results for High Income and Low Income countries as defined by the World Bank

Figure 1: Number of Attacks for Terrorist Groups 1968-2007

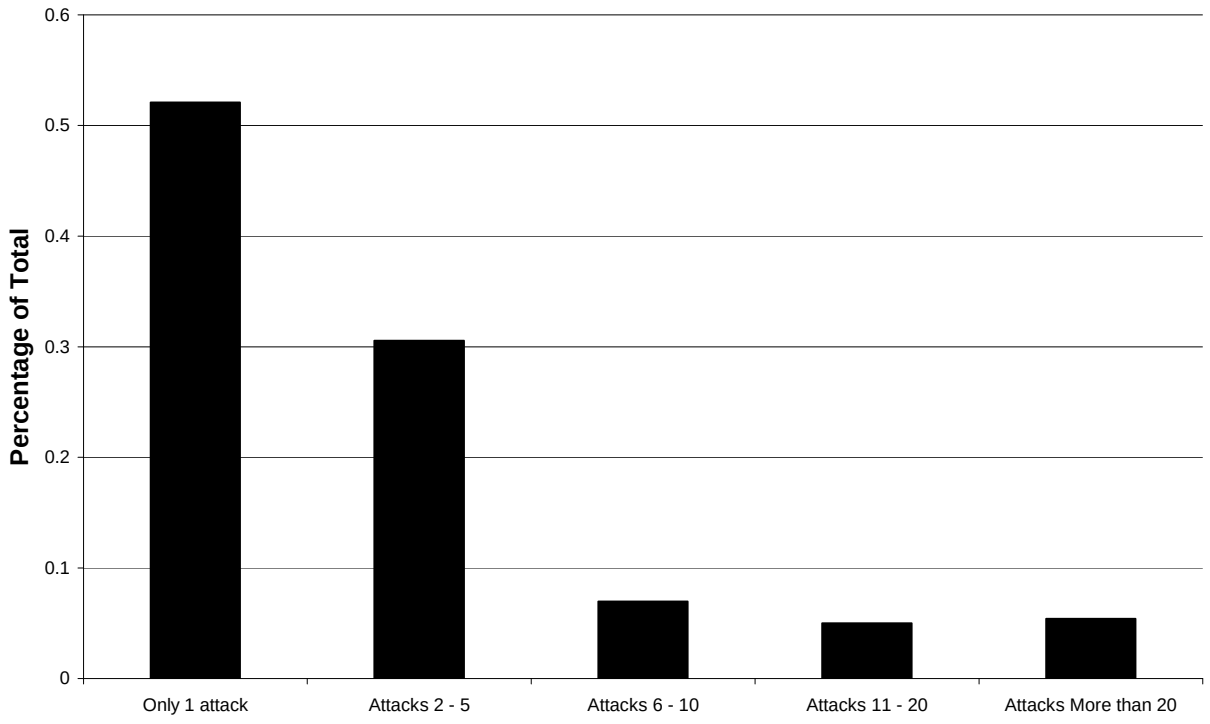

Figure 2: Number of Terrorist Organizations from 1968 to 2007

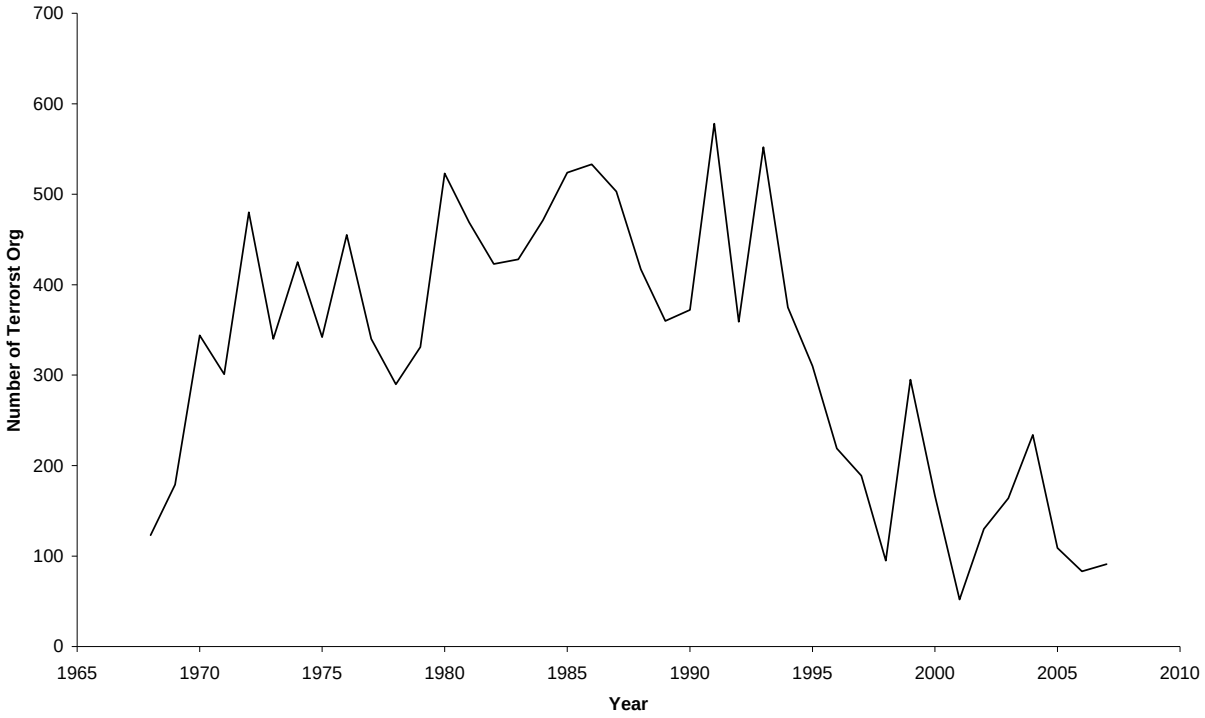
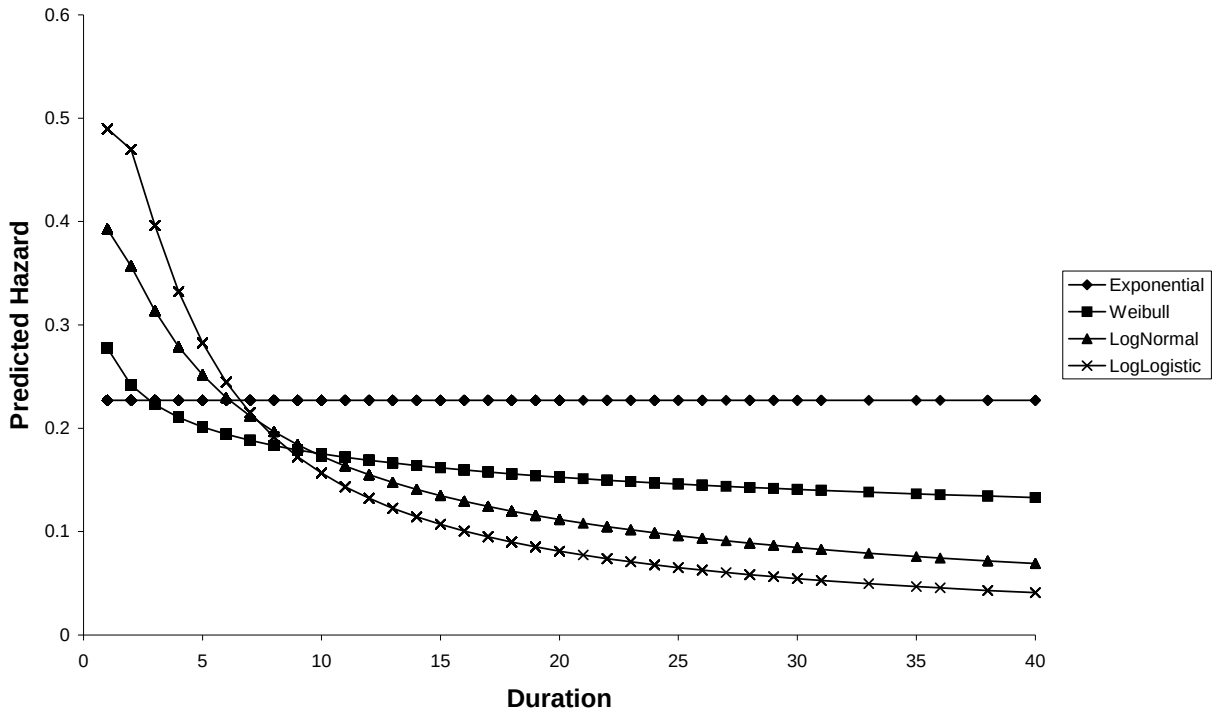
Figure 3: Hazard Functions