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## Determinants of the duration and ending of terrorist and other non-state armed groups

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# **Courant Research Centre**

## **'Poverty, Equity and Growth in Developing and Transition Countries: Statistical Methods and Empirical Analysis'**

**Georg-August-Universität Göttingen**  
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Discussion Papers

**No. 140**

**Determinants of the duration and ending of terrorist and other non-state armed groups**

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# Determinants of the duration and ending of terrorist and other non-state armed groups

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July 2013

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## **Abstract:**

This study empirically investigates the impact of group characteristics and host country conditions on the duration and the ending of terrorist organizations and rebel groups. The empirical analysis relies on data for more than 600 armed groups from the Terrorist Organization Profiles, collected by the MIPT, and employs discrete time duration models with unobserved heterogeneity and its application to a setting with competing risks. It is found that organizations stabilize over time and face the highest risk of failure at the beginning. Factors that motivate members play an important role, as does support from other countries. Rich states are more likely to defeat armed groups and there is no evidence found that a restriction of civil rights decreases the duration of armed groups or increases the likelihood of capturing them.

**Keywords:** Terrorist organizations; Insurgency; Duration analysis; Discrete time duration model; Competing risk regression; Civil war

**JEL:** H56; D74; H39

## 1. Introduction

This article empirically investigates the life-span or duration of non-state armed organizations and identifies factors which lead to these groups' cessation, considering the different ways in which such a group can end. Terrorism and civil conflict have strong negative effects on the economy, society and each individual in the affected country or region. There has been a large increase in literature regarding both terrorism and civil war in the last two decades. While both topics have much in common, the contributions in the literature have, in most cases, treated them more or less separately. Empirical research so far, has mainly focused on the explanation of the onset and duration of civil war or incidences of acts of terrorism in a country. A comprehensive overview over the civil war literature can be found in Blattman and Miguel (2010) and most strands of the terrorism literature are surveyed in Schneider et al. (2011a/b). An overview over the comprehensive research literature, that relates incidents of terrorism to country characteristics, can be found in Gassebner and Luechinger (2011).

The importance of armed groups - and therefore the importance of investigating them - is clear, because they form the organizational unit for terroristic attacks and insurgency. Without them, there is no civil conflict and only few terrorist attacks are committed by individuals alone. The main questions about those organizations are therefore, why they form, how they work, why they either succeed in reaching their goal or fail in their fight and how long they exist. The duration of terrorist organizations is very unequal. While many organizations dissolve after only one attack or short campaigns of violence, others persist for decades. It is therefore important to assess what factors do contribute to the duration of such organizations.

Despite their importance, empirical research of factors leading to the creation and ending of organizations behind such violent acts is very scarce. The purpose and contribution of this paper is to investigate how long armed groups exist, what factors influence their duration and in which way they end, by using a large dataset of terrorist and rebel organizations. The dataset is mainly based on the 'Terrorist Organization Profiles' (TOP), originally collected by the Memorial Institute for the Prevention of Terrorism (MIPT). The goal of this study is not to explain why such groups form or when and how often they attack.

The issues of duration and ending type are directly related and can be empirically assessed using econometric duration models. Specifically, this study uses discrete time duration models, controlling for unobserved heterogeneity, and applies this to a setting of competing risks. To the author's knowledge there are no empirical studies about the duration of terrorist organizations, with the exception of Blomberg et al. (2010), who focus on transnational terrorists.

Some of the main findings of the empirical analysis are that groups in general are least stable at the beginning, nationalist and separatist groups are somewhat more lasting than others, more powerful states are much more likely to defeat the groups and the restriction of civil liberties does not help to defeat terrorists.

## 2. Definitions and Classifications

While everyone has an idea of what civil war and terrorism are, exact definitions can be quite controversial. A common definition for civil war, in economic and political research, is a conflict within a country between its government and at least one more party that causes more than a certain threshold number of deaths either per year or accumulated.<sup>1</sup> The non-state actors in such a conflict are usually referred to as rebels, guerrillas or insurgents.

In contrast to this, there are countless different definitions for terrorism or terroristic attacks. Some of the most common definitions stem from the US State Department, the European Union, the UN Security Council and more from the research community.<sup>2</sup> The most important goal of those definitions is to separate terrorism from criminal acts. Therefore, researchers and policy makers usually require the violence or threat of violence, to be associated with some form of political goal and the intention to influence a government, the public or another organization to behave in a certain way, by spreading fear or panic. The definition of a political

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<sup>1</sup> There are two major datasets for civil war, the Correlates of War project (COW) and UCDP/PRIO. The COW requires a civil war to be military action internal to the state system, active participation of the government, effective resistance on both sides and at least 1000 battle related fatalities per year. For more details see Sarkees (2010) and Sarkess and Waymand (2010). The UCDP/PRIO dataset sets the number of deaths per year at the much lower level of 25 for what they classify as civil conflict and also at 1000 for civil war. For details see Gleditsch et al. (2002).

<sup>2</sup> US Department of State definition: Office of the Law Revision Counsel of the U.S. House of Representatives (2011): United States Code, Title 22 Section 2656f(d). EU definition: European Union (2002). For an overview over UN Security Council definitions see Saul (2005) and as one example: UN Security Council (2004). Example for a common definition in the research community: Enders and Sandler (2006) p. 3.

goal is usually rather broad, but important for the separation from regular crimes, where the motivations are mostly profit and personal/emotional issues. One important difference between the definitions is, whether or not the victims are required to be non-combatants and violence against state agents - such as the police or the military - is counted as terrorism. While the US Department of State does not count violence against the military as terrorism many other definitions do.<sup>3</sup> A frequent requirement is also that the terrorists are trying to spread fear beyond the actual target group.

It is in many cases very difficult to distinguish between terrorists and insurgents: 'The line between rebel and terrorist groups is blurry' (Blattman and Miguel, 2010). Both employ violence as a means to pursue political goals, mostly but not necessarily, against the state. While rebel groups engage in open battle and guerrilla warfare, they also use terrorist attacks as an additional tactic. Wide parts of guerrilla warfare are technically terrorist attacks according to many definitions. A 'classic' terrorist organization will however not engage in open battle. Under the presence of a rebel army, the state usually does not have full control over all of its territory, while this is not necessarily the case under the presence of a terrorist organization. This finding is in line with the common view that the difference mainly lies in the strength of the organization, relative to the strength of the state an organization is operating against. In a strong state, such organizations stay small and rely only on terrorist attacks, while in weaker states they may grow and become an insurgent army (e.g., Sanchez Cuenca and de la Calle (2009), p.32). In the public debate, the categorization of different armed groups is also unclear, since now many organizations that earlier were called rebel groups, are listed as terrorist organizations, e.g., the Revolutionary Armed Forces of Colombia (FARC) which have been declared terrorists by the U.S. Department of State and the EU.

Due to the close relationship between rebel and terrorist groups and the difficulties of distinction, both organization types are pooled in this paper and jointly investigated. The organizations of interest here are at least loosely organized groups, comprising more than one individual, that have relied on violence or were actively planning to do so<sup>4</sup> and pursue a political goal.

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<sup>3</sup> For a short discussion of victims see Enders and Sandler (2006), p.3

<sup>4</sup> In some cases the organizations were discovered before they had been able to execute their first attack.

When looking at the influences of group characteristics and conditions however, one has to acknowledge the differences between guerrillas and terrorists. Guerrillas are large in size and therefore require more resources and support. As stated by Collier and Hoeffler (2004) 'rebellion needs [...] opportunity' (p.563). Since rebels are normally weaker than the state in military terms, they require areas to retreat to and to hide. Such safe havens could be provided by mountainous or wooded terrain. For the same reason, large countries with low population densities are also more advantageous to the survival of a rebel army. Large organizations need to supply their troops, which implies a large financial and logistical effort and thereby a need to generate or extract income. Depending on how well they are able to do this, they might need support from the population. Weinstein (2007) provides interesting case studies of how rebel armies behave towards the population also depending on the ability to secure sufficient resources with or without them.

Small terrorist groups on the other side, are often urban-based and operate secretly. They do not depend on terrain and the interaction with the population is different. Since it is much easier to support small groups, they can persist with significantly fewer resources. The individual members - since they are not full day soldiers - might just support themselves or will rely on small support networks, which do not have to be based in their country of operation.

Another broad categorization of terrorist organizations could be made according to their relationship with the local population, because not all arguments about group duration may apply in the same fashion to all categories. A proposal for a simple distinction could be two categories: Ideological and representing groups. As stated by Crenshaw (1981) terrorism is a tool of small elites. A distinctive feature is therefore whether or not the group represents larger parts of the population, a specific region or ethnicity.

In ethno-nationalist or secessionist conflicts, or rebellions against autocratic regimes, the groups tend to represent a significant share of the population. These groups often enjoy much support and can potentially grow into large rebellion movements, working towards a regime change or autonomy. These are classified as representing groups and even though they might have some ideological foundation, the contact to and support from the surrounding population are of greatest importance. In contrast, the ideological groups do care much less about the population. They tend to be much smaller groups of ideological radicals (political or religious),

who even operate without support and against the will of the population (often claiming to know what is best for the population even though it does not share this view).

Such ideological groups are the most common form of terrorist groups in democratic countries. They are usually small and do not enjoy much support from the general public (the public does not share their political goals). This implies that they do not have the possibility to use the democratic process for their usually quite radical purpose, but still try to reach their goal in other ways. Examples would be leftist groups fighting for a socialist revolution in Western democracies during the 1970's, which definitely was not the popular opinion among the population.

### **3. Literature**

Duration analysis has been used in the conflict literature to identify the factors influencing the duration of civil wars (see, e.g., Collier et al., 2004 and Buhaug et al., 2009). The subject of investigation in this study is obviously different, as it assesses the duration of organizations and not conflicts per se. In the case of smaller terrorist organization, the threshold number of deaths for a civil war is usually not reached. When looking at large rebel groups, whose fight is classified as a civil war, the end of one group does not necessarily represent the end of the conflict, as there might be more parties involved. The end of the conflict on the other hand, might not be the end of the group, since they might continue, e.g., on a smaller scale. This implies that the above-mentioned literature can only give limited insight into the topic of interest here. The outcomes of civil wars have been one subject of study in DeRouen and Sobek (2004). They specifically mention the bias in the data, due to the exclusion of small groups that never start an open war with the government.

There is hardly any literature that deals with the duration and ending of terrorist or insurgent groups. The exceptions are Jones and Libicki (2008), Cronin (2009) and Blomberg et al. (2010). Jones and Libicki (2008) compile a list of 648 terrorist organizations from the RAND-MIPT Terrorism Incident database and add the start and end year and more characteristics of each group. Their data is one of the main sources used in this paper.<sup>5</sup> The by far largest part of their

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<sup>5</sup> The data can be found as a table in the appendix of their study.



research consists of comparative case studies while the empirical analysis remains very short and shows no results probably also due to methodological issues.

Relying on case studies and descriptive statistics, Cronin (2009) studies six different types of endings for terrorist organizations and discusses reasons and processes triggering these endings. Her data is a reduced sample of the 'Terrorist Organization Profiles' from the MIPT 'Terrorism Knowledge Base'. She excludes all groups that have exclusively targeted property or military targets without hurting civilians and groups that have only carried out one or one series of attacks. Cronin (2009) argues that an organization or its campaign will endure, as long as it can maintain what she calls momentum. This can be kept up by the actions of the groups or by the reactions of their opponents. 'Overreactions' or 'overly repressive law enforcement campaigns can add to the momentum of terrorists. She concludes that capturing terrorists or terrorist leaders, is much more effective than killing them, because it demystifies them, taking away the momentum. She considers negotiation as a slow process, which only in very few cases leads to the desired outcome. A common end for groups is the implosion or marginalization, especially when groups lose support from the population, often due to their own tactics.

The study with the most similar approach to this one is Blomberg et al. (2010). It looks at the impact of target country characteristics on the duration of transnational terrorist organizations using survival analysis techniques, specifically Weibull regressions. They find a negative duration dependence, which means that the risk of ending for an organization decreases over time and that the probability of survival of a group increases with the income and population of targeted countries. The empirical analysis has however some major shortcomings. Blomberg et al. (2010) rely on the 'International terrorism: attributes of terrorist events' (ITERATE) database. The ITERATE database records what it defines as international terrorism events. Sanchez-Cuenca and de la Calle (2009) give some reasons, why this definition, as well as its implications are problematic, especially considering that international terrorism represents only a very small share of the overall terrorist activities in the world. The duration time of an organization in the Blomberg study is determined by setting the start point at the first attack and looking at the continuation of attacks by the groups, where it is effectively considered as ended if no further attacks occur. The most problematic point about this setup is that one group may carry out attacks that are classified as international and others that are not. So a group might exist for decades but if it only carries out one attack - which happens to be

classified as international - it will appear in the dataset as a group with a one-year duration. Because of the definition of international attacks, such a scenario is not unlikely. It may be observable for a purely domestic terrorist group that once kills, e.g., by chance, a tourist in a bombing attack. Furthermore, the formation of a group does not necessarily coincide with the year of its first attack. Instead, considerable time might pass between the foundation of an organization and the planning and execution of an attack. Because of this the determination of the duration time of a terrorist group is highly problematic.

The covariates of the analysis in Blomberg et al. (2010) do not contain information about the individual groups, but only about the target country. Since by definition the terrorists do not come from the target country, it is questionable whether the conditions in that country are the most important determinants for the survival of the organization. The only information related to the individual groups is the number of attacks and number of victims of those attacks. Both numbers - again due to the definition of international attacks - will only reflect a small portion of the groups' real activity. One example of this is the Colombian FARC which was founded in the 1960's and is still active. In the Blomberg data - which covers 1968 to 2007 - it is however recorded with a duration of only 29 years, instead of the full 39 and only 67 attacks are listed. In the observed time, the FARC has without doubt executed thousands of attacks, but those are not recorded, because they did not involve foreigners or foreign territory. As a consequence, the data only provides information about the international activities of the organization, while excluding information about the organization itself or the conditions in the country. As a last problem, the data contains groups that are no actual groups, but rather general categories for possibly many unidentified groups. Examples are Arab and Palestinian guerrillas, Colombian guerrillas, German right wing guerrillas and Somalian guerrillas (all of which are reported in the table of the groups with the highest incidences of attacks).

To the author's knowledge, there has been no empirical investigation of the duration of terrorist and rebel organizations, except for the study by Blomberg et al. (2010). This study therefore tries to provide a quantitative analysis improving their approach and complementing the qualitative and comparative analysis by Jones and Libicki (2008) and Cronin (2009). It uses a dataset much more suitable for the subject of investigation, adding data about the groups' characteristics and about the country where they are actually based. The econometric

techniques used are also more appropriate for the data structure and offer some more flexibility.

## **4. Hypotheses and Theoretical Considerations**

### **Decision framework**

The theoretical framework of this analysis is based on what is sometimes referred to as the strategic model of terrorism. Even though it is usually not applied to rebel organizations, the theory can easily be extended to account for these groups as well. A similar framework is, e.g., used by Collier and Hoeffler (2004) to explain the onset of rebellions. The following points are mostly taken from McCormick (2003) who provides a review of the literature on the strategic framework for terrorism. Terrorist organizations in the strategic framework are considered to be rational actors with rather stable preferences who consider terrorism as the optimal strategy choice to pursue their goals. This implies that the organization is seen as a collective with common preferences and can be treated like an individual. While this is of course a simplification, it is not unreasonable. The organization has a common goal which they try to achieve and dissent among members is resolved within the group. If the preferences of members differ too much, the groups will most likely disintegrate or split. If they are rational actors, they will view all possible alternative strategies for achieving their goal and will choose the optimum, considering the expected political returns and the cost of each strategy. In reality, the concept of bounded rationality might apply, where the decision-makers face incomplete information or mental restrictions. This means that they could later discover that their initial assessment of the situation is no longer or was never correct.

Terrorism or any form of political violence is therefore a strategy or tool to achieve a desired political outcome. Conditions leading to violence as the optimal choice are described by Crenshaw (1981). There must be a grievance among at least a small part of the population and the goal of the groups must be to end it. As a motivation for violence, Crenshaw (1981) sees the 'lack of opportunity for political participation' (p. 383). Furthermore, she views terrorism as the 'result of elite disaffection' (p. 384). This elite might, or might not represent larger parts of the population. If the group was strong enough they would openly rebel or stage a coup d'état. So again, the difference between terrorism and rebellion is mainly seen as a matter of relative

strength. Regarding the lack of political participation, a common counterargument is that there is quite a lot of terrorism in democratic countries with a wide range of participation possibilities. A better formulation might therefore be to say that the goal is nearly impossible to achieve using regular political activities.

## **The imperative of continuation**

Kydd and Walter (2006) argue that terrorists are not able to reach their objective militarily but try to alter 'the audience's beliefs about such matters, as the terrorist's ability to impose costs and their degree of commitment to their cause' (p.50). If terrorist organizations do not have the means to defeat their enemy they can only hope to achieve their goal if they make the intended audience believe that the cost of fighting them is too high to not make any concessions. This course of action requires if possible high profile attacks and the expectation of the continuation of attacks. If the audience expects the terrorist group to not continue there is no reason to make concessions. Kydd and Walter (2006) define this as the attrition strategy. Terrorism in this context can be seen as a costly signalling process showing the resolve of the groups to impose costs on others at a cost for themselves. So once violence has been chosen as a strategy continuation becomes imperative to maintain the credible threat if they hope to convince their audience. McCormick (2003) refers to the need to continue in order to 'hold their audience'. This also shows that terrorism and its continuation are necessary to keep the perceived grievance on the media's agenda, which is an argument also supported by Rohner and Frey (2007) who set up a model where the media coverage acts as a multiplier for the benefits terrorists derive from their action creating a 'mutually beneficial relationship [...]' where the media profits from spectacular terrorist attacks. So if they are rational actors they will continue until they have reached their goal, or continuation has become impossible. Looking at larger rebel organizations similar strategic considerations apply. Even though they might be able to win by force, this is only a quick way if they are much more powerful than the ruling regime which is nearly never the case. So if they are not able to overpower the regime in a quick coup d'état (which is usually not staged by rebel groups but by the military itself) they will have to fight until they succeed, or are able to secure enough concessions from the state or cannot continue, just like the smaller terrorist groups.

## **Rational choice and terrorism duration**

If the continuation of terrorism is imperative, it must be part of the initial decision. If terrorism is a rational choice, there has to be a cost-benefit calculation that leads to the decision to use terrorism in the first place. Only if the benefits the terrorists have from fighting are larger than the cost they face, they will use terrorism. They will continue to do so until this condition is not fulfilled anymore, they are not able to continue, have found a more promising alternative way or have reached their goal.

Terrorism is a costly action for the terrorists. It imposes costs on the members of the terrorist organization and on the organization itself. The costs for the members are mainly non-monetary. By engaging in terrorism they face strongly increased risk in their life, namely the risk of being detected and consequently arrested or killed. Stress and trauma can also be considered part of this, as well as the disruption of family life and possibly restricted mobility. In addition they have opportunity costs through foregone earnings.

The organization itself faces more direct costs. They need recruits, material and financial resources in order to continue their activities.

How large the costs of terrorism are, is mainly determined by the state. If detection and defeat are more likely because of a powerful regime with a good law enforcement and military infrastructure, the cost for a single terrorist is higher, as it is for the organization which will need more resources for their fight. Important factors contributing to this are the anti-terrorism policies of the state and the political system. In a liberal democratic state, terrorism might be easier because the law also protects the civil rights of terrorists.

Since the costs for the members are, except for the forgone earnings, mainly non-financial, the terrorists need compensation beyond regular pay, which could be motivation and the expectance of victory. Only if the group can sufficiently motivate their fighters they will continue and the group will be able to find new recruits. A possible source of motivation can be religion as it promises future benefits and might help to find recruits in religious circles.

When the costs for the organization members become higher than the benefits, e.g., the motivation, they will stop and the group disappears. This also happens if members realize that

terrorism was not the optimal choice for reaching their goal. Anything that increases the cost or reduces the motivation will make this ending more likely. A lack of motivational tools of the organization and, e.g., higher probability of detection under more oppressive or stronger regimes will have this effect. If the organization cannot create agreement between the members and motivate them to work together, another consequence can be for the organization to splinter into factions. This could happen if, e.g., at least a part of the organization sees alternatives to fighting.

For the organization, it will only be possible to continue terrorist actions, if the costs can at least be covered. This requires the organization to gain sufficient support (financially and maybe logistically). Reliance on future gains, as is sometimes assumed for rebellions, is only an option if the organization has the possibility to borrow. This will only be possible for the largest organizations in specific situations and so in general it can be assumed that organizations without enough support cease to exist.

Support can be local or international. Cronin (2009) argues that groups 'cannot survive without either active or passive support from a surrounding population.' Active refers to financial and material support and especially the provision with new recruits, while passive support means, e.g., to accept or ignore the presence or operation of such a group. Phillips (2011) presents a theoretical model that emphasizes the importance of such 'grassroots support' for the duration of terrorist groups and expects this support to be greater in ethno-nationalist conflicts. Abrahams (2008) gives an overview over an increasing literature that has found people to join terrorist organizations, because of the contact with other members in their social environment. Since it can be assumed that those networks are stronger in ethno-nationalist conflicts, recruitment is expected to be easier in such situations and duration to be consequently higher. Support from the outside can be just as important. It is a well known fact that many terrorist organizations have been and are still backed and supplied by foreign governments. This can happen through training or hiding possibilities in other countries, or the direct supply with money and material. All of this should greatly increase the duration of the organizations.

The lack of support can lead to the disappearance of the group or make its defeat more likely. Without passive support they can be more easily detected and maybe not avoid state forces by retreating into foreign territory. Without active support (training and material) the military

defeat is easier. If all, or a significant part of the members of the organization, have been captured or killed the continuation of terrorism is simply impossible. Such an event is more likely if the state is relatively stronger characterized by its financial and military/police resources. A common assumption is also that regimes with less civil rights have more possibilities to monitor the general public, facilitating the capture of terrorists.

Disappearance and defeat are involuntary endings of terrorist groups from their perspective (even though splintering/disappearance is voluntary from the perspective of at least a part of the members). Armed groups could however also end in different ways.

An ending due to a political process might be a negotiated ceasefire, a peace agreement or a change in the situation that rectifies the original grievance leading to the fight. Negotiations require willingness on both sides. The higher the benefit from fighting and a possible victory (i.e. the higher the motivation of the members) the less likely it will be that an organization negotiates. A stronger state will probably be less likely to negotiate, as it sees the terrorists or rebels as a smaller threat. On the other hand, democratic regimes might be more willing to negotiate because the political settlement of conflicts is an integral part of democracy. The general public, which is usually the target audience that terrorists want to impress, also has a greater influence on a democratic government and might therefore more easily motivate it to negotiate, in order to end the violence, even if this includes making concessions to the terrorists. A last point is that negotiation is more likely if the terrorist's goal is not too extreme. Governments will not easily accept a regime change or giving up a part of their territory, but a change in policy might be more negotiable.

If however the state is too weak and the group has enough support, they might be able to successfully implement their goals, in which case a continuation of terrorist activity becomes unnecessary.

### **The effect of time (duration dependence)**

Looking at the duration of anything involves investigating the time dependence of processes. The probability of survival or continuation of terrorist organizations will probably change over

time. In general the risk of failure for an organization should be highest at the beginning and then decrease over time. The beginning involves the first steps of recruitment, organization setup and generation of support and is therefore the most risky and unstable period. Over time, experience increases, the organizations can grow, become better known and attract more recruits and establish a larger support base, which will increase their probability of survival.

A major problem is the distinction whether this duration dependence comes from unobserved factors or is really correlated with time. Unobserved factors are, e.g., the skills of the group's leadership. Less talented or intelligent leaders or group founders might not be able to keep groups together for a long time, or are quickly captured. This implies an early ending but is not an effect of time. The learning effects mentioned above however do happen over time. To better distinguish between these scenarios (besides empirical strategies that try to account for unobserved heterogeneity) the specific endings of the organizations can provide some insights.

Organizations that end by splintering or disintegration will probably end quickly and follow the above pattern quite closely. If the organization is not able to motivate their members they will leave and the organization collapses. The same applies when members first come to realize the cost of terrorism, which is probably at the beginning, and change their mind. Therefore, splintering and especially disintegration will be most likely at the beginning and then become less likely over time. Much of this should be attributed to the unobserved factors, because the realization of having made a wrong decision implies less talented leaders or members who did not have the mental capacity to fully anticipate the consequences of their decisions. In the case of defeat the risk will be somewhat higher at the beginning as the organization did not have much time to grow and build up strength (this could be in part attributed to the unobserved factors). However if the organization continues its activity over time, the government might have a bigger interest in defeating them and will devote more resources to the fight. Negotiation is a process that will usually not start in the beginning, but rather after a longer duration of the conflict. If neither side is making significant progress, they will have a stronger motivation to find another solution. Therefore a solution of the conflict through negotiation will be less likely at the beginning and increase over time. The probability of victory will also probably increase over time when the organization has had the opportunity to grow stronger. In both cases this should rather be a true effect of time than of unobserved factors.



## Hypotheses

From this, the following hypotheses are derived, to be tested in the empirical analysis:

- H1: Ethnic/secessionist movements increase the duration of terrorist organizations as they provide more support.
- H2: Internationally operating organizations last longer because of the possibilities of support and hiding in and from other countries and the necessity for coordinated efforts to defeat them.
- H3: Motivation increases the duration of terrorist organizations and will decrease the likelihood of negotiation.
- H4: More powerful states will decrease the duration of terrorist organizations because of their ability to defeat them and because in such states the cost of terrorism is higher. Powerful states are also less likely to negotiate.
- H5: More oppressive regimes will decrease the duration of terrorist organizations as they will more easily detect terrorists. More oppression also increase the likelihood of disappearance or splintering of the group, by increasing the cost of terrorism.
- H6: Democratic regimes will be more likely to negotiate as they face more pressure from the public to end violence and negotiation is an integral part of democracy.
- H7: Negotiation is more likely if the goal is less comprehensive (e.g., a change in a single policy).
- H8: Terrorist organizations generally are more likely to fail in the beginning than in later periods when they have had more time to organize and establish themselves; they are especially less likely to splinter or disappear.
- H9: Victory and negotiation are more likely to happen after longer durations of conflict.

## 5. Data

The main data source for information about terrorist and other armed groups, that is used here, are the Terrorist Organization Profiles (TOP) from the Terrorist Knowledge Database (TKB), collected by the Memorial Institute for the Prevention of Terrorism (MIPT). This database

- the same that is used by Cronin (2009) - was updated until 2008 when the project ceased to exist. To this point, the organization profiles of more than 860 organizations are made available from the website of the 'National Consortium for the Study of Terrorism and Responses to Terrorism' (START) but they are not maintained, checked or updated. These profiles were matched with the data from Jones and Libicki (2008), from whom especially the end dates were used.<sup>6</sup> Determining when a terrorist organization started and when it ended is not always straightforward. For most groups some information is available from media accounts, group statements or experts. Jones and Libicki (2008) use as start year the 'first indication that the group existed and was dedicated to the use of violence. The end year of a terrorist group was assigned based on the earliest evidence that the group no longer existed or that the group no longer used terrorism to achieve its goals' (p. 5). Their data does not cover all organizations contained in the TOP (only about 650) so the same standards were used to determine the end year of the remaining groups, in case they were no longer active (the start year is reported in the TOP). If there was no information about the current status of an organization available and there was no indication of activity in the last five years from online news searches, the Global Terrorism Database or the RAND/MIPT Terrorist Incidents Database, the group was assumed to have ended. An important aspect of this is that only the time as a terrorist group is counted. Any time that the group existed before or after but was not using, planning or supporting violence is not considered.

The type of ending and the organization's goals were also taken from their data but have been partially recoded to fit the categories described below. The political orientation recorded in their data was compared to the data from the TOP and also recoded.

Both TOP and Jones and Libicki (2008) report the countries where the groups were active. This information was compared and if more than one country was listed it was determined which country was the main base of operations for the group, usually from the text descriptions in the TOP. For this method, there are of course unclear cases where the groups have their bases in border regions or have changed their base in the course of their existence. In this case the region where they had spent most of their time was chosen.

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<sup>6</sup> More information about how the data was obtained and subsequently modified can be found in the technical notes in the appendix.

The majority of the resulting data entries about the organizations, after the compilation, were checked manually. Some codings from the database were revised if additional information suggested that the coding was incorrect or outdated and missing data was added if possible. For all groups that were still considered active, it was checked whether there was any indication that they had ended in the meantime or that they were still active in 2011. The main sources of information for the addition and revision of data were the TOP text descriptions, the Global Terrorism Database, the RAND/MIPT Terrorist Incidents Database, the 'Violent Extremism Knowledge Base' (VKB) of the Institute for the Study of Violent Groups (ISVG), the research project 'Mapping Militant Organizations' from Stanford University, the 'South Asia Terrorism Portal' and internet news searches. A future extension could be to add new organizations which has however not been done in the present study.

Not all organizations listed in the data are used for the final analysis. More than 200 entries have been excluded leaving 645 organizations for the empirical analysis. Groups were excluded for various reasons. Since the TOP data focuses on groups that have been active since the 1960's, we exclude all groups that were founded before the year 1960, since only longer lasting organizations founded before would be observed. Some groups are large political parties where only a very small fraction of the members has contact with terrorist activities. Some are the political arm of another terrorist organization that is listed as well and including both would mean double counting. A few groups are known or strongly suspected to be cover names for other organizations (e.g., 'Arab Revolutionary Brigades' for 'Al-Fatah') and in some cases there was never a real organization but just a single terrorist who claimed to be an organization. Purely criminal organizations were also removed from the analysis (e.g., Mara Salvatruchas, a street gang from El Salvador). Quite many organizations listed in the TOP data, are Greek anarchists who usually just commit one attack and disappear. These are not considered to be real organizations. In very few cases, organizations were excluded if there was too little reliable information available and it was questionable whether the organization ever existed.

Using, checking and modifying the above data sources, the following information about the organizations was obtained: Start and end year, political orientation, goal, approximate peak size, financial sources (only in a few cases), whether it can be categorized as a religious group and whether the groups' operations or bases were located in more than one country. Only very

few of these characteristics are likely to change over time (mainly the size) but for those there are no observations over time.

The idea of this paper is not only to analyse the duration of the organizations and the factors that led to their cessation but also in which way they ended. The possible endings have been coded in 4 categories as outlined in the theory section: The first is 'Policing/Military defeat' which refers to cases where either the whole group or at least an important part of it was either captured or killed by the police or military, thus effectively ending the organizations' ability to continue their struggle. The second category is 'Splintering or Disappearance'. This definition refers to all cases where the group split into various factions or when organizations just disappeared for unknown reasons. The third ending refers to political processes like peace agreements or permanent ceasefires. The same coding was used if the organization refrained from any future use of violence and, e.g., started to pursue its goals on the political stage. A small fraction of groups abandoned their fight because the situation in the country changed so that the original goal was not existent anymore. An example for the latter is the 'Manuel Rodriguez Patriotic Front' (El Frente Patriotico Manuel Rodriguez) in Chile which intended to bring down the Pinochet regime. After the regime's fall (not due to the organizations activities otherwise it would have been a victory) there was effectively no reason for them to continue. A follow up organization with the same name (but obviously different goals) split off from the original group. In the data however they are coded as separate organizations. These cases are not investigated as a category of their own (because there are too few) but especially for them it is a fine line to the last ending category: 'Victory' which is used if the organization successfully implemented their goal. There are only very few observations in the data where this has happened which makes the separate analysis of this outcome practically impossible.

Organizations were classified by their type and by their goal. The classifications are based on the categories in the TOP and in the Jones and Libicki data. The different types are 'Nationalist or Separatist', 'Left-Wing', 'Right-Wing' and 'Anarchist'. The most general category here is probably the 'Left-Wing' since it is coded to also contain militant environmentalists or animal rights or anti globalization activists. Anarchists are the smallest category.

The possible goals of organizations are classified as 'Territorial Change' which can refer to expansive or separatist movements, 'Regime Change' if the organization wants to end the

government or whole political system (e.g., wanting to turn a democracy into socialism), 'Policy change' if the goal is more specific (e.g., a change in one law or a change in foreign policy) and the 'Status Quo' if the groups wants to stop a reform or other processes of change.

An extra variable identifies whether or not the organization has a religious background. The aspect of religion has not been used as a category of its own, because in most cases organizations are not just religious. As a characteristic it can be combined with all the above types and goals.

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provides an idea about the distribution of organization characteristics in the data. Most of the organizations are classified as either Nationalist/Separatist (50%) or Left Wing (26%), Anarchists being the smallest category. The non-political organizations are mostly religious ones but there are also many religious groups with a political orientation. In total, about 30% of the organizations in the data have a religious orientation. The actual separatist movements can be more easily identified by their goal which is coded as territorial change. They account for a little more than 30% of the sample. The most common goal is a regime change (46%). Of the listed organizations, 30% are classified as still active while about 30% ended due to splintering or disappeared without information. Another common ending is police or military action (22%). Only very few organizations were coded as having achieved victory (3%). Most organizations are small with less than 100 members (55%) and only 16% are coded as large organizations (more than 1000 members). The organizations were mostly located in the MENA countries, Europe and South and South East Asia (each about 20%).

Since the conditions in the country where the organization is based undoubtedly will have strong effects on its survival, socio-economic indicators of the countries have been compiled and added to the group data as yearly country observations. As a first remark, the West Bank and Gaza are treated as a country in this study and the respective indicators were used for the groups based in these regions. The income indicator for the countries is the GDP per capita, measured in thousands of 2005 International Dollars PPP and taken from the Penn World Tables (Heston et. al., 2011). Additional income data for West Bank and Gaza were taken from the World Development Indicators (World Bank, 2012). This is also the source of the population-density measure (people per square kilometre). The measure for civil rights is the index of civil liberties published by Freedom House (2012). The index ranges from 1 to 7 where 7 is the lowest level of civil liberties or the highest level of oppression. The index is based on information about the freedom of expression, belief, association, the rule of law, personal autonomy and individual rights. Democracy is measured as a dummy variable based on the dataset by Cheibub et. al. (2010). They distinguish between 3 different types of democracies and dictatorships respectively, based on indicators about executive selection, legislative selection, legality and existence of political parties etc. This study uses all 3 democracy classifications to identify democratic countries. There are many proposals for measures concerning ethnic concentration, polarization and fractionalization. Behind them are different



assumptions of how ethnic composition fuels conflict. This analysis uses a very simple indicator, which is just the size of the second largest ethnic group in the country (as a share of the whole population). This serves as a measure of whether there is a large minority in a country. The measure is far from perfect, but that is true for most others and this one is easily available for most countries and years from Ellingsen (2000). Since the ethnic composition in countries is rather stable (especially this indicator) there is hardly any variation over time. Whether or not the use of such an ethnicity indicator is necessary or appropriate is questionable anyway, because many organizations in the data have no ethnic background at all.

## 6. Empirical Model

The common approach for estimating any kind of duration or spell data is the use of survival analysis techniques. The interest lies in the estimation of the hazard rate, which is the conditional probability of leaving a spell at a specific time, which in this case refers to the probability for a terrorist organization to cease to exist (this is often referred to as 'failure'). To this end, a proportional hazard model for discrete time duration data is employed, taking into account possible unobserved heterogeneity and the possibility of different outcomes or endings.

A general formulation of proportional hazard (PH) models or 'multiplicative hazard' models is the following:

$$h_i(t, X) = h_0(t) \exp(\beta' X_{it})$$

Where  $h_i$  is the hazard of failure for individual  $i$  during time interval  $t$ , depending on additional characteristics.  $h_0(t)$  is the so-called baseline hazard that varies only with time but is identical for all individuals and  $\exp(\beta' X_{it})$  is a non-negative function of individual specific time-varying or time constant covariates ( $X_{it}$ ) that scale the baseline hazard. A PH model assumes that there is some kind of duration dependence for all individuals represented by the baseline hazard and this is then multiplicatively modified or scaled by the individual-specific covariates. PH models can be used in a continuous or discrete time setting. The analysis of Blomberg et al.

(2010) employs continuous time models. In their data as well as ours, however time is observed in discrete intervals (years) and the typical duration amounts to only a few periods. This means that a PH model for discrete time intervals (and not a continuous time model like the Weibull model) seems more appropriate. Such a model is presented by Prentice and Gloeckler (1978). The discrete time hazard is given by:

$$h(j, X) = 1 - \exp[-\exp(\beta' X_{it} + \gamma_j)]$$

Where  $j$  refers to the observed time interval and  $\gamma_j$  is the interval-specific baseline hazard rate. This is the hazard for an organization to end during a specific time interval (period or year), given that it has survived until the beginning of this interval.

Additional to the observed covariates there might be unobserved characteristics causing heterogeneity which is usually referred to as 'frailty' in the survival literature. Meyer (1990) proposes a model with an unobservable random individual effect that enters the hazard multiplicatively and has a gamma distribution. This is often referred to as a 'mixed proportional hazard' model and gives the following hazard:

$$h(j, X) = 1 - \exp[-\exp(\beta' X_{it} + \gamma_j + \ln(v))]$$

Where  $v$  is the unobserved random effect.<sup>7</sup>

While the general models uses any ending of a terrorist organization, more insights can likely be gained by also taking into account that organizations can end in different ways and that the influences of the covariates might affect different outcomes in different ways. The various endings are usually called competing risks, because any outcome prevents any other outcome from ever happening. Under the assumption of independence between the risks, one can estimate a single risk model for each risk, with the above methods, by simply treating all organizations that ended in any other way as right-censored. Even though this is a strong assumption it is the common approach and will be used here as well. Discrete time duration models with competing risks and unobserved heterogeneity have so far been mainly used for

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<sup>7</sup> This model is estimated in STATA using the `pgmhaz8` procedure by Stephen Jenkins as described in Jenkins (1997). Under the assumption of no unobserved heterogeneity, the model is estimated with a complementary log-log regression (`cloglog`).

the investigation of the duration of unemployment (for the application of a very similar approach as above to unemployment see, e.g., Böheim and Taylor 2002).

One other important assumption these models make, is that the hazards are actually proportional, meaning that the relative difference in hazards between two organizations due to different characteristics should not vary over time. One problem is that in the data the approximate size of the organization is observed only at its peak and not at every point in time. Since it takes time for an organization to grow to a certain size it is clear that a large organization needs to have survived for a certain time in order to have become large. This implies that the peak size, as a covariate, would most likely violate the proportionality assumption, because the survival probability of a large organization must be higher in the beginning. Tests confirm this and the variable is not used in the regression.

As a last point there are different possibilities to model the baseline hazard. This study uses a so-called semi-parametric model that estimates a baseline hazard for specific intervals of time. This approach is more flexible than, e.g., the Weibull model used by Blomberg et al. (2010). The Weibull model uses a fully parametric baseline hazard, the shape of which is restricted to forms determined by an estimated shape parameter. Estimating the semi-parametric baseline is only possible if there are enough observed failures in each of the intervals. Since this is not always the case for each year in the data, especially in the competing risks setting, intervals are grouped, trying to keep the baseline as flexible as possible.<sup>8</sup> The estimation of this baseline allows to get a closer look at the suspected duration dependence patterns outlined above.

## 7. Empirical Analysis

Looking at the descriptive statistics for the average duration by organization type can give a first idea about the hypotheses. Table 1 shows the total number of organizations and the number of those that have already ended, by categories. For the organizations that have been classified as ended, the average duration time is given as well. Still active groups are not counted for these averages. This of course causes a bias in the averages but including active

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<sup>8</sup> The groups are: year 1, year 2, years 3-5, years 6-10, years 11-15, years 16-25 and years 26-40

organizations does as well, because it is only known how long they have lasted already, but their future duration is unknown. This can be partially illustrated by Figure 1, which is a histogram, showing how many organizations lasted for a particular number of years. It includes those groups that have ended already and the ones that have not. From this figure it can be seen that most terrorist organizations last a rather short time. Table 1 shows that duration is highest for separatist movements and those seeking to maintain the status quo. As is quite logical, larger organizations last longer (as already mentioned they will need time to become large in the first place). An interesting aspect is that the groups that ended victorious or through politics lasted much longer than the others. Possible explanations might be that victory is hard to achieve and that a political end might take so long, because negotiations become a more attractive option for both sides, when they realize, after a long time, that neither side is able to win and that the general population is tired of fighting. In these simple statistics the religious groups have a much shorter lifespan than the others. The main problem with this is that the majority of religious groups in the data is still active and so the long lasting ones are not part of the calculated means.

While some of the hypotheses include directly observable characteristics, other factors cannot be directly observed or characteristics could be interpreted in different ways. One of those is the ability of organizations to motivate their members. There are no straightforward proxies for this, so it is assumed that motivation is highest and most lasting, if the organization members expect a difficult fight from the beginning, which is the case if the goal pursued is very difficult to achieve. This could, e.g., be an intended regime change since this naturally is what every system tries hardest to prevent. If the goal is less difficult, e.g., a policy change, the members might expect a shorter fight and loose motivation if the goal is not achieved quickly. Religion is also assumed to be very strong motivational tool and religiousness is observed in the data.

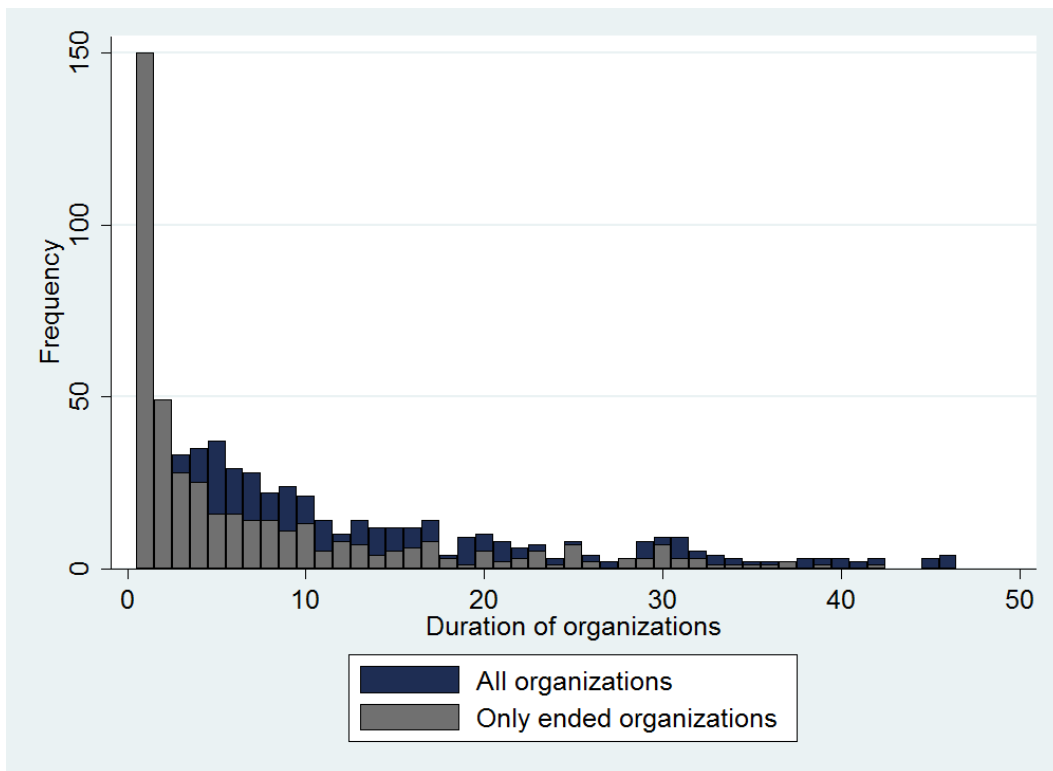


Figure 1

Actual support is only known for a small fraction of the organizations and is therefore not included. As already stated in the hypotheses, local support will be most likely in the case of secessionist and nationalist movements, which is therefore interpreted in this way. A hint towards international support could be if the organization maintains bases in more than one country.<sup>9</sup> While this does not necessarily mean that the group is directly supported by another country, which is however often the case, at least it hints towards passive support, meaning that the choice of maintaining bases in more than one country will probably have something to do with unequal prosecution across the countries.<sup>10</sup> International operation however also suggests a more flexible and maybe better organization structure, so it offers itself to more than one interpretation.

<sup>9</sup> In the data such groups are coded as international organizations. This is not to be confused with the use of international in the literature of transnational terrorism. Staging attacks in other countries or merely attacking foreign nationals in their own country does not qualify a group as international in this data. They are only international if the group or significant parts of it are based in different countries or move between them.

<sup>10</sup> Groups in the Palestinian-Israeli conflict tend to have more than one base country because they are prosecuted in Israel but not in neighbouring countries. Colombian guerrillas are known to retreat into Ecuador and Venezuela to avoid confrontations with the military forces.

## Regression Results

The regression tables report the estimation results of the different specifications using the discrete time proportional hazard model with an unobserved individual effect. However in nearly no regression the likelihood ratio test can reject the null hypothesis that there is no unobserved heterogeneity. This implies that either there actually is no heterogeneity, or the method used cannot account for it and it will mainly be captured by the baseline. Using the competing risks and hypotheses, it should however be possible to gain some insights into the underlying processes. All tables containing estimation results, report hazard ratios instead of estimation coefficients. This allows for an easier quantification of the effects since a hazard ratio of 1.08 can be interpreted as an 8 percent higher risk of failure (i.e. end of the organization) and a ratio of 0.97 as a 3 percent lower risk. The estimation results for the time intervals representing the baseline hazard are not reported instead they are presented graphically in Figures 2-5. Estimates that do not meet the 10 percent significance threshold are considered insignificant in this study.

Table 2 reports the results for the general duration model where the focus is not on a specific type of ending, but any ending is considered. The first column reports the simplest model containing only the group characteristics. The model in column 2 adds region fixed effects to this, in order to account for different background conditions for the organizations.<sup>11</sup> Both models contain the full estimation sample and the coefficients do not show very large differences between the specifications. The reference category for the organizations' goals is the territorial change, since separatist movements are expected to be the most stable ones. Estimations confirm that organizations with different goals generally face a higher risk of failure in any given period but the estimates are not always significant at the 10 percent level. While the risk for groups that fight for a regime change and which are also expected to be rather long lasting, is somewhat higher (15-45%), the estimate of the risk of failure is up to more than twice as high for groups that want a policy change. Religious groups - as expected and contrary to the descriptive statistics - are less likely to fail (by about 30%), as are also the internationally operating groups (more than 40% less likely).

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<sup>11</sup> Country fixed effects are not possible as there are not enough observations of ended groups across all countries.

Columns 3 and 4 show the full model, including time-varying country indicators to give a better understanding of how the conditions in their base country influence the duration of the armed groups. Since these country indicators are not available for all relevant countries, a few groups are lost and for the others there are less observation periods. Column 3 shows the model without and column 4 the model with region fixed effects. Both results are similar to the first models additionally showing a higher risk of failure in countries with a higher GDP. Although the effect might seem small, it is the effect of an increase by only \$1000. Population density and democracy show up significant at the 10 percent level and reduce the risk of failure, suggesting that terrorist groups exist longer in democracies. These results turn insignificant when region fixed effects are added to the model in column 4, while the other results remain stable. The measures for civil liberties and ethnic composition are insignificant in these specifications.

These results for the general model give some support to the hypotheses. Secessionist movements seem to be somewhat more stable than others as stated in H1. The same is true for internationally operating groups as stated in H2. Religious groups last longer and in richer states groups face a higher risk of failure which is claimed in H3 and H4. H5 however finds no support from these models as civil liberties have no statistically significant effect on the risk of group ending.

A problem with the introduction of region dummies is that there is a systematic correlation between, e.g., GDP and the religious indicator and the regions because richer countries or religious groups are very unevenly distributed among the regions. This strongly increases the standard errors of some of the indicators.

Figure 2 shows the baseline hazard over time, at the mean of all covariates, for the full model without region fixed effects (point estimates and smoothed). The risk of failure is quite high in the first year (nearly 25%) and then quickly decreases. After about 15 years the risk increases again slightly. As there are fewer and fewer observations of failures in later periods the estimations become likely less accurate and for the model to be more easily estimated the flexibility of the baseline is strongly restricted after 15 years, leading to the flat portions at the end. The general pattern however supports Hypothesis 8 that the risk is highest in the beginning and then decreases over time.

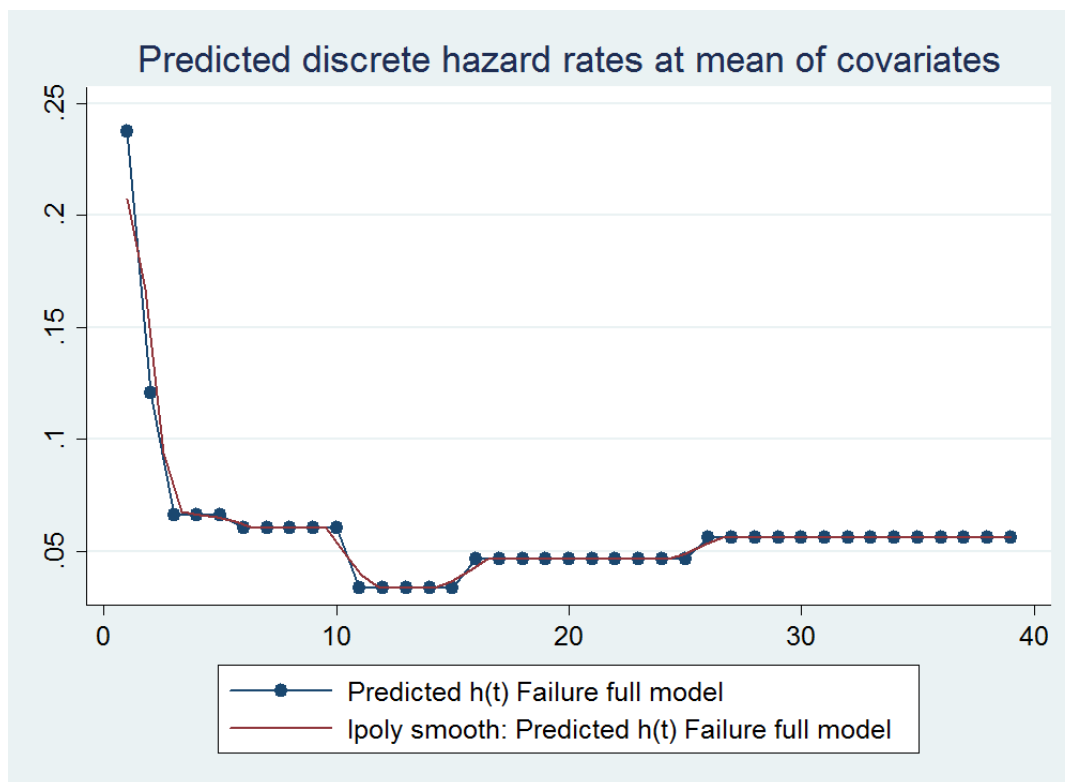


Figure 2

The organizations' political orientations are not used in these first models. The theoretical framework presented does not suggest that groups with a certain political orientation should last longer than others, with the exception of Nationalist and Separatist groups. Nationalist and separatist groups are however quite well captured by the territorial change goal (the correlation between both indicators is about 0.6). Additionally, there are more high correlations, e.g., between the non-political category and the religious indicator (correlation also about 0.6).

Table 3 shows results for general duration if political orientations are incorporated. Column 1 presents the results if goals are left out and without country characteristics. Here Nationalist and Left-Wing groups have a lower risk of failure compared to the reference category (no political orientation). If the goals are added (column 2) only the Left-Wing indicator remains significant and if country characteristics are controlled for, they do not seem to have any additional explanatory power. All other indicators are similar to the models without political



orientation, the main difference is that the religious dummy has a higher significance level and the democracy indicator remains significant at the 10 percent level, even if region fixed effects are added. Since they do not seem to add very much to the model, the indicators of political orientation are left out in all other models.

## **Competing Risk Regression**

Using the model for each specific competing risk, it is possible to estimate the impact of the variables, not only on the general duration, but on the likelihood for the organizations to end in one of the ways described above. As mentioned before, any group that ended in another way than the one specifically investigated in a model, is treated as right censored. The other model specifications are the same as above. A major problem with this approach is that the number of groups that are observed to end in a specific way is of course much lower than in the above model. The investigation of different endings should however be able to give a better insight into the channels of how the observed characteristics impact the duration of armed groups.

Table 4 presents the models for organizations ending by police or military intervention. In the full model this was the ending of nearly 140 of the groups in the data. Table 5 gives results for 'Splintering' which happened to 185 of the observed cases and Table 6 shows estimations for political endings, which only happened about 60 times. The columns are organized as in Table 2, each model (with and without country indicators) is presented first without and then with region fixed effects. Victory and political endings where the situation changed, were not analysed, because there are too few observations of such cases.

Looking at the results for groups with different goals, it is found that groups who want a policy change face a much higher risk of failure in the general model. While there is not much evidence that they are defeated more often they seem to have a significant and much higher risk to either splinter or disappear or end in a political process. This gives support to H3 that a less comprehensive goal is less motivating and will more easily lead to the disintegration of the groups, as well as to H7 showing that negotiation about such goals seems easier. For groups who want a regime change there is a higher risk in the general model (except for one specification) but practically no evidence in the competing risk models. Organizations whose

interest is the perpetuation of the status quo seem to be more willing to negotiate, which might reflect the fact that negotiation over this might be easier for a ruling regime.

Religion as a proxy for motivation lowers the risk of failure for groups in the general model. There is no significant evidence that it reduces the probability of splintering and disintegration (the hazard ratio is however below one and in most specifications close to the 10 percent significance level). This does not fit hypothesis 3 about the effect of motivation. There is however some evidence, that religious groups are less likely to negotiate or end politically even though this is only significant in the models without region dummies (maybe due to the correlation between region and religion).

Internationally operating groups are much less likely to fail in the general model. Hypothesis 2 attributes this to the possibility of hiding in other countries (the unequal prosecution across different countries) and maybe even getting support from them. Both should especially reduce the risk of defeat which is confirmed by nearly all specifications. Only in the full model with region fixed effects is the hazard ratio insignificant (but below 1). The variable also shows a strong effect reducing the likelihood of disintegration and splintering, which might be a hint towards the importance of foreign support to maintain operations which is also part of H2.

When it comes to the importance of the environment in which the organizations operate, the civil liberties variable (a higher index value means less civil liberties) does not show up significant in the general model. The main argument for restricting civil liberties, as also stated in H5, is that, e.g., the facilitation of the intrusion into people's privacy helps uncovering and ultimately defeating or policing such groups. This does not show up in the analysis. When it comes to the probability of defeat, the variable is insignificant and the hazard ratio is even smaller than one, indicating that more oppression (reduction of civil liberties) reduces the risk of failure (in the specification without region dummies this is even nearly significant at the 10 percent level). There is however some evidence (significance in one of two models) that less civil liberties increases the likelihood of disintegration of groups which could be connected to the increased costs of terrorists in such an environment.

Richer and thereby more powerful states (measured by the GDP per capita variable) strongly increase the likelihood of failure of terrorist organizations. H5 states that this is because of the increased capabilities of the state to fight and defeat them. This result from the general model

is backed up by the results of the defeat model, in which the hazard ratios are even much higher and highly significant. GDP also shows up significant in the context of splintering (only without region fixed effects), which might hint towards the higher cost for terrorists, due to the increased probability of detection. There is also some evidence that richer states are less likely to negotiate with terrorists, as they probably pose less of a threat to them (again only significant without region dummies).

Population density as a proxy for terrain only shows up significant in the general and one specification of the defeat model implying that a higher population density reduces the likelihood of failure, which does not fit the hypotheses.

The ethnicity measure only shows up significant once, when it comes to splintering or disappearance of groups and would indicate that this is less likely to happen if there is a large ethnic minority in a country. The data does not suggest that such larger minorities, in general, play a big role for the duration of terrorists, this can however be attributed to the fact that it would only matter in conflicts that do have some ethnic component.

There is some evidence of democracy increasing the lifespan of armed groups. Specifically, it seems that democracies are much less likely to defeat them. H6 is not supported by the data since democracies do not appear to be more willing to negotiate than others regimes.

Figure 3 shows the calculated baseline hazard for defeat supporting the idea that the risk for defeat is highest at the beginning and then decreases. It does however seem to increase again later which could indicate a higher effort of the state to fight long-lasting groups.

Figure 4 gives the baseline results for splintering or disintegration showing a very high risk at the beginning with a strong decrease afterwards. Since there are hardly any observations of groups that failed in this way after more than 10 years, those results are probably not too reliable. This result gives support to hypothesis 8.

Figure 5 confirms hypothesis 9 that negotiation is unlikely in the early years of a group's existence (with the exception of year 1) but becomes more likely over time.



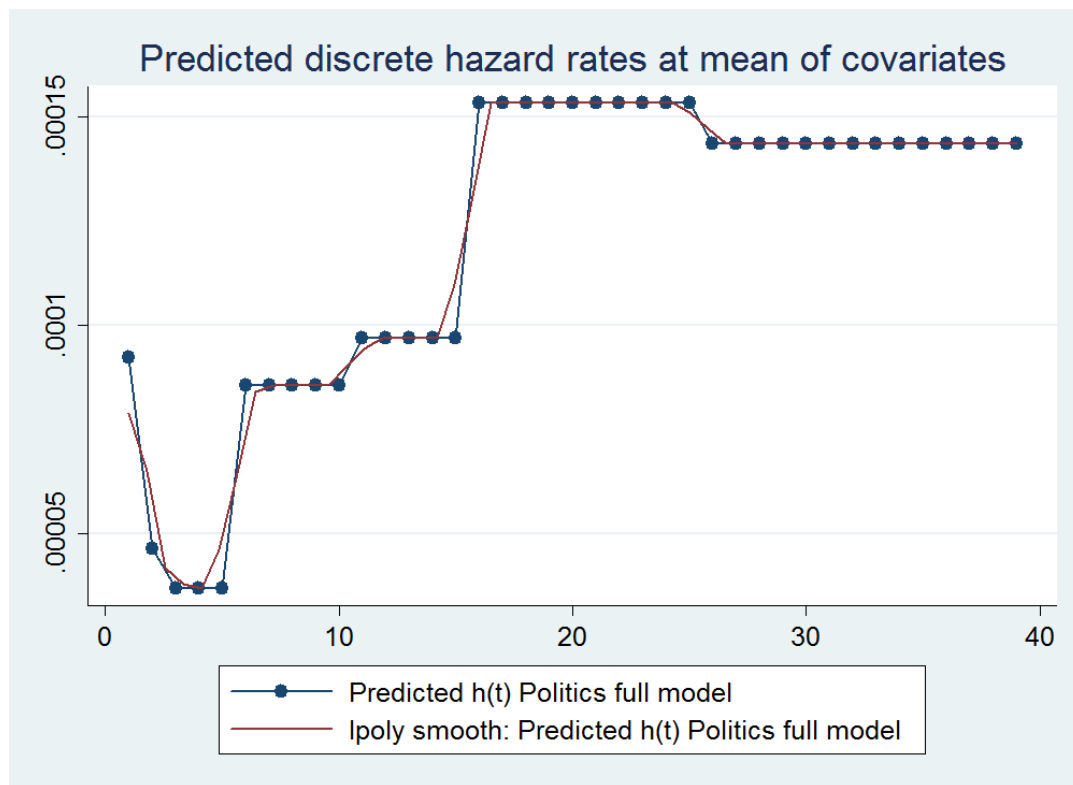


Figure5

## 8. Summary and Conclusions

This paper uses discrete time duration models to estimate the effect of different factors on the duration and ending type of non-state armed groups. It is the first time a comprehensive dataset about terrorist and rebel groups has been used for such a purpose, giving the possibility to include group characteristics, country characteristics and duration dependence into the estimation. The data used is much more suitable to investigate duration than data about terrorist attacks which, does not give very much information about the groups behind them. The methodology is also more appropriate for this kind of data - where the observed intervals are rather long compared to the average duration - than the continuous time models used before.

Since there is no empirical literature about this topic there is no strict focus on the effect of a single factor on groups duration, but a whole array of hypotheses are tested.

Some of the conclusions are that motivational factors as, e.g., religious motivation are very important to keep a terrorist group together by offering the members a compensation for the cost they incur from participating in an armed campaign. There is also evidence that such groups tend to not negotiate, maybe out of greater dedication to their cause or because they know that most of their demands will not be met.

Maintaining bases in more than one country seems an important factor for explaining longer durations of groups. Hiding and evasion of state forces are likely to be behind this and it can also be a hint towards support from other countries (letting groups hide could be seen as passive support). This result shows how important cooperation between countries is, if terrorist groups are to be defeated.

Local support - proxied by nationalist and separatist groups - seems to increase the duration of armed groups as well. This should be expected, as without the necessary means it is impossible to continue a fight.

It is also not surprising that a higher income allows countries to set up and maintain much better police forces and military systems and enables them to detect and defeat armed groups more easily, which also increases the cost for terrorists and thereby seems to also contribute to the disintegration of such organizations.

This study cannot find any evidence implying that a restriction of civil rights helps to fight and defeat armed groups. There is some indication that groups are more likely to disappear under such circumstances, but the effect on policing is, if anything, negative. There is also no hint that regimes with less civil liberties shorten the duration of terrorist organizations in general.

Armed groups - mainly those with simpler goals or those who seek to maintain the status quo - are more likely to negotiate and negotiation is a process that usually starts at later periods of the organization's existence, probably because after a long fight this option becomes more attractive for all sides.

In general, organizations seem to fail mainly at the beginning and if they make it to get through the starting phase their chances of survival increase very much. From this it could also be

concluded that anti-terrorism efforts should be most effective shortly after a group has been founded.

This study relies mainly on the interpretation of proxy variables, which is a major short-coming. There is however no data the author is aware of, that would allow a more exact approach. Currently there are not many publicly accessible, free databases of terrorist organizations that are maintained and updated regularly (there are some large databases maintained by private firms like IHS Jane's and TRAC). Exceptions are the Institute for the Study of Violent Groups (ISVG), the research project 'Mapping Militant Organizations' at the Stanford University and the group profiles of the 'South Asia Terrorism Portal' (all of which were used to check some of the information in the data). All these give very detailed, mainly qualitative information, but only for rather few groups (and in the last case only for a specific region). For any empirical investigation the number of groups would probably have to be extended and especially the information coded. The compilation and generation of better data about terrorist organizations and a continuation of their investigation should therefore be an interesting and promising field of future research. Especially interesting could be the thorough investigation of financial sources and group structures, for which however much more information would be needed.

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Table 1

Descriptive Statistics for duration of ended organizations								
Category		Total count	Total percent	Count ended	Mean Duration	Std. Dev.	Min.	Max.
All Organizations		645	-	435	7.27	8.85	1	42
By: Goal of Organization	Regime change	299	46.36	208	7.75	8.79	1	37
	Territorial change	205	31.78	112	8.80	10.15	1	39
	Policy change	121	18.76	99	4.06	5.38	1	30
	Status Quo	20	3.1	16	10.19	12.29	1	42
By: Political Orientation	No political orientation	107	16.59	57	4.42	6.89	1	30
	Nationalist/Separatist	316	48.99	200	7.71	9.69	1	42
	Left-Wing	170	26.36	135	8.79	8.82	1	37
	Right-Wing	31	4.81	25	5.20	6.10	1	26
	Anarchist	21	3.26	18	2.89	1.81	1	7
By: Religiousness	Non-religious	451	69.92	345	7.73	9.11	1	42
	Religious	194	30.08	90	5.50	7.57	1	31
By: Ending Type	Still Active	209	32.4	-	-	-	-	-
	Policing/Military defeat	146	22.79	-	8.03	8.19	1	34
	Splintering/Disappearance	198	30.7	-	3.95	6.36	1	36
	Politics (Ceasefire/other)	71	11.01	-	12.79	11.22	1	42
	Victory	20	3.1	-	15.00	9.89	1	32
By: Size of Organization	<100	365	56.59	290	3.60	5.19	1	32
	<1000	183	28.37	93	12.09	8.98	1	39
	<10000	72	11.16	32	18.53	10.62	6	42
	>10000	25	3.88	20	20.05	9.99	4	37
By: Region	USA & Canada	43	6.67	39	5.77	6.03	1	26
	Latin America & Caribbean	95	14.73	79	8.65	8.08	1	35
	Middle East & North Africa	152	23.57	95	5.49	8.04	1	33
	Sub-Saharan Africa	40	6.2	28	15.86	11.51	1	39
	Europe	142	22.02	119	5.54	8.34	1	42
	South & South East Asia	126	19.53	48	9.10	9.88	1	36
	East Asia & Oceania	12	1.86	7	8.43	11.86	1	32
	Central Asia	35	5.43	20	6.65	7.56	1	29

**Table 2**

<b>Duration of Terrorist Organizations</b>				
Polit. Change	2.629*** (4.58)	2.426*** (3.88)	1.749*** (2.95)	1.692*** (2.72)
Regime Change	1.441*** (2.62)	1.230 (1.30)	1.268* (1.69)	1.161 (0.99)
StatusQuo	1.633 (1.54)	1.248 (0.65)	1.238 (0.69)	1.084 (0.25)
Religious	0.639*** (-3.26)	0.729* (-1.85)	0.686*** (-2.66)	0.715** (-2.07)
Int. operations	0.569*** (-3.18)	0.536*** (-3.44)	0.628*** (-2.76)	0.608*** (-2.90)
State oppression			0.996 (-0.07)	0.971 (-0.40)
GDP p.c. 1000's Int.\$			1.036*** (3.46)	1.029** (2.26)
Pop. Density			0.999* (-1.67)	1.000 (-0.55)
Size 2nd ethnicity			0.995 (-0.69)	0.998 (-0.24)
Democracy			0.722* (-1.76)	0.890 (-0.57)
No. Subjects	645	645	612	612
No. Failures	435	435	402	402
No. Obs.	6985	6985	5800	5800
Region fixed effects	no	yes	no	yes

Hazard ratios reported; t-statistics in parentheses. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level respectively

**Table 3**

<b>Duration of Terrorist Organizations</b>				
Nationalist/Sep.	0.579** (-2.20)	0.761 (-1.11)	0.740 (-1.34)	0.910 (-0.40)
Left Wing	0.533** (-1.96)	0.551** (-1.98)	0.655 (-1.53)	0.660 (-1.48)
Right Wing	0.804 (-0.61)	0.743 (-0.83)	0.658 (-1.28)	0.655 (-1.27)
Anarchist	0.982 (-0.04)	1.123 (0.30)	0.812 (-0.56)	0.861 (-0.39)
Polit. Change		2.848*** (4.26)		1.955*** (3.29)
Regime Change		1.558** (2.55)		1.459** (2.19)
StatusQuo		1.642 (1.48)		1.275 (0.76)
Religious	0.462*** (-3.52)	0.500*** (-3.40)	0.559*** (-3.13)	0.585*** (-2.88)
Int. operations	0.493*** (-3.01)	0.526*** (-3.26)	0.553*** (-3.25)	0.593*** (-2.95)
State oppression			0.966 (-0.54)	0.974 (-0.40)
GDP p.c. 1000's Int.\$			1.036*** (3.59)	1.034*** (3.33)
Pop. Density			0.999** (-2.19)	0.999* (-1.87)
Size 2nd ethnicity			0.997 (-0.52)	0.995 (-0.66)
Democracy			0.690** (-2.01)	0.728* (-1.67)
No. Subjects	645	645	612	612
No. Failures	435	435	402	402
No. Obs.	6985	6985	5800	5800

**Table 4**

<b>End by defeat</b>				
Polit. Change	2.553***	1.436	1.565	1.257
	(2.64)	(1.04)	(1.27)	(0.64)
Regime Change	1.700**	1.207	1.239	1.168
	(2.37)	(0.77)	(0.77)	(0.55)
StatusQuo	1.423	0.900	0.699	0.693
	(0.61)	(-0.19)	(-0.49)	(-0.53)
Religious	0.723	0.938	1.045	1.029
	(-1.52)	(-0.24)	(0.16)	(0.09)
Int. operations	0.591**	0.663*	0.599*	0.674
	(-2.05)	(-1.71)	(-1.71)	(-1.36)
State oppression			0.821	0.907
			(-1.60)	(-0.73)
GDP p.c. 1000's Int.\$			1.084***	1.091***
			(4.37)	(3.84)
Pop. Density			0.998*	1.000
			(-1.80)	(-0.24)
Size 2nd ethnicity			1.019	0.996
			(1.36)	(-0.26)
Democracy			0.398**	0.466**
			(-2.48)	(-2.04)
No. Subjects	645	645	612	612
No. Failures	146	146	134	134
No. Obs.	6985	6985	5800	5800
Region fixed effects	no	yes	no	yes

Hazard ratios reported; t-statistics in parentheses. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level respectively

**Table 5**

<b>End by Splintering / Disappearance</b>				
Polit. Change	4.609**	2.391***	1.557**	1.808**
	(2.08)	(3.17)	(2.00)	(2.51)
Regime Change	1.399	1.299	1.334	1.266
	(0.87)	(1.28)	(1.57)	(1.21)
StatusQuo	0.602	0.629	0.546	0.543
	(-0.51)	(-0.74)	(-1.00)	(-1.00)
Religious	0.845	0.717	0.741	0.709
	(-0.46)	(-1.56)	(-1.61)	(-1.60)
Int. operations	0.206**	0.487***	0.624**	0.582**
	(-1.98)	(-2.84)	(-2.15)	(-2.37)
State oppression			1.251***	1.130
			(2.80)	(1.28)
GDP p.c. 1000's Int.\$			1.043***	1.020
			(4.11)	(1.31)
Pop. Density			1.000	1.000
			(0.31)	(0.13)
Size 2nd ethnicity			0.979**	1.003
			(-2.25)	(0.25)
Democracy			1.055	1.417
			(0.22)	(1.10)
No. Subjects	645	645	612	612
No. Failures	198	198	185	185
No. Obs.	6985	6985	5800	5800
Region fixed effects	no	yes	no	yes

Hazard ratios reported; t-statistics in parentheses. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level respectively

Table 6

<b>Political Ending</b>				
Polit. Change	1.842 (1.52)	2.498** (1.99)	2.654** (2.20)	2.503* (1.89)
Regime Change	0.997 (-0.01)	0.960 (-0.10)	1.180 (0.45)	0.983 (-0.04)
StatusQuo	4.342*** (3.03)	4.339*** (2.66)	6.069*** (3.40)	4.337** (2.55)
Religious	0.466** (-1.96)	0.501 (-1.56)	0.492* (-1.76)	0.592 (-1.13)
Int. operations	0.687 (-1.18)	0.698 (-1.07)	0.817 (-0.57)	0.717 (-0.88)
State oppression			0.956 (-0.28)	0.928 (-0.43)
GDP p.c. 1000's Int.\$			0.950** (-2.12)	0.957 (-1.05)
Pop. Density			1.000 (-0.12)	1.000 (0.44)
Size 2nd ethnicity			0.994 (-0.37)	0.996 (-0.23)
Democracy			1.402 (0.73)	2.015 (1.29)
No. Subjects	645	590	612	560
No. Failures	56	56	52	52
No. Obs.	6985	6451	5800	5332
Region fixed effects	no	yes	no	yes

Hazard ratios reported; t-statistics in parentheses. \*\*\*, \*\*, \* denote significance at the 1%, 5%, 10% level respectively