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Rebel Strength and Post-Agreement Conflict: a Disaggregated Analysis

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1: Abstract

Peace agreements vary dramatically in their outcomes, with some failing almost immediately and others marking the beginning of a long stable peace. This study seeks to explain these differences by focusing on the military strength of rebel groups. Through a capability based spoiling perspective, it is hypothesised that post-agreement conflict risk is positively associated with rebel strength. Quantitative duration analysis utilising Cox proportional hazards modelling is employed to test the hypothesis. The results of the empirical evaluation thoroughly support the prediction. Furthermore, examination of disaggregated levels of rebel strength reveals that rebel ability to procure arms is the mechanism through which rebel strength heightens post-agreement conflict risk. The cases of the Ugandan NRA and Fatah of the Israeli-Palestinian crisis serve to illustrate the explanatory capacity of the finding. Avenues for future research, policy implications and limitations of the study are discussed.

2: Introduction

Peace agreements are a puzzle. Through signing a settlement, the belligerents of a conflict formally affirm that they are willing to give negotiated peace a chance. The primary objective of any peace agreement is to produce a stable negative peace. The success of any settlement must, at least initially, be judged on whether armed conflict has recrudesced. A glance at the history of peace agreement outcomes reveals substantial variation on this basic criterion. Some peace agreements signed after intra-state conflict have produced exceptionally durable peace, whereas others collapse in a matter of months. The Agreement for Firm and Lasting Peace between the URNG and the government of Guatemala ended a 36-year civil war and has stood for two decades, whereas the Islamabad Accord between the Afghan government and the Hezb-i-Islami broke down almost immediately. Similarly, the Good Friday Agreement brought a paradigmatically stable negative peace to Northern Ireland, while the Oslo Accords of the Israeli-Palestinian conflict imploded, culminating in the brutal Second Intifada. Thus, a natural question to ask is what explains such wild inconsistency in peace agreement success and failure?

Scholars of political science have tackled this question from a variety of angles. Badran (2014) assesses the quality of peace agreements and finds that settlements with a high number of procedural and structural measures are less likely to suffer conflict recurrence. Focusing on implementation Joshi, Quinn and Regan (2015) show that settlement signatories are more likely to return to fighting if the terms of a peace agreement are poorly implemented. Furthermore, Hartzell and Hoddie (2003) explain that agreements which accommodate power sharing are associated with a smaller likelihood of post-settlement peace failure. A classic perspective focuses on credible

commitment and accordingly stresses the importance of third-party mediation for a successful agreement (Walter, 1997).

An approach which has received markedly less attention in assessing determinants of peace agreement failure focuses on the strength of actors. More broadly, actor strength has been linked with both peace and conflict. For example, authors writing about conflict termination explain that military victory produces surprisingly stable peace since the losing side is militarily nullified (Licklider, 1995). Without a sufficient organisational structure, an opposition that has suffered total military defeat will experience substantial difficulty in restarting the conflict (Wagner, 1993). This results in a scenario where what is left of the losing side's support base must tolerate the reality of defeat, regardless of their dissatisfaction. Additionally, the work of Buhaug, Cederman and Rød (2008) show that the size of politically excluded minority groups is a factor that predicts whether that group will take to violence to alter the status quo. Such findings are reminiscent of the old Thucydidean adage that the strong do what they can and the weak suffer what they must. Thus, actor strength is likely to be an important factor in understanding post-settlement dynamics of internal armed conflict recurrence due to its relationship with the broader concepts of peace and conflict.

This study seeks to quantitatively assess the relationship between actor strength and the likelihood of peace agreement failure. Walter (2004) observes that rebel groups as opposed to governments are almost always the instigators of internal armed conflicts and in turn define the parameters of violence. Indeed, any internal armed conflict represents a threat to a state government's monopoly over coercion, with peace agreements being a vehicle for its re-establishment. The onus to take to the battlefield in a post-agreement scenario therefore rests on rebel groups. Hence, this study shall focus on variations of rebel strength and its relation to post-agreement conflict risk.

An additional objective of this study is to disaggregate rebel strength into its components. This allows for examination of specific causal mechanisms that govern the relationship between rebel strength conflict recurrence, in turn affording more sophisticated understanding of the issues. Rebel strength has been disaggregated in qualitative studies to great effect. In a study of African insurgencies, Young (1996) puts forwards explanations centred on military strength for why some rebels succeeded and others failed in their ambitions. He emphasises the multi-dimensional nature of rebel military capabilities, exemplifying the need for disaggregation of this composite concept. Furthermore, Jo's (2015) research on rebel compliance disaggregates rebel strength to assess how the different sub-mechanisms affect rebel behaviour. She is able to achieve a granularity in her explanations that would difficult to achieve by treating rebel strength as a broad aggregated concept. Quantitative analysis involving disaggregated rebel strength has now been made possible due to advancements in the quality of available data, namely the Non-State Actors in Armed Conflict Dataset (Cunningham, Gleditsch and Salehyan 2013).

3: Rebel Strength

Since rebel strength is the primary aspect of this study, it is imperative to define the term. All rebel groups are of a certain level of strength, which refers to military capability affecting capacity to fight a conflict (Nilsson, 2010). Strength can vary dramatically between rebel groups, ranging from sophisticated fully-fledged organisations capable of conventional warfare to comparatively humble bands of guerrilla fighters. The notion of rebel strength is a composite one, with multiple mechanisms being the determinants of overall strength. Crucially, rebel strength must be conceptualised as relative rather than absolute: a rebel group which is weak in absolute terms may pose serious threat to a weak government while a comparably sized rebel group would be a trivial foe to a much more powerful state (Buhaug, 2010). Conceiving of rebel strength in a relativistic fashion is analogous to traditional international relations theory which understands state capacity as a function of inter-state power distribution (Art, 1980).

One approach that has been popular in conflict studies literature that seeks to relate rebel strength and peace in the post-settlement context is that of ripeness. Ripeness theory posits that peace agreements are signed and the peace they produce is stable when conditions are optimal or 'ripe'. Ripeness is related to the existence of a mutually hurting stalemate, whereby neither side of a conflict can emerge victorious but at the same time continued fighting incurs continuous damage for both sides. Consequently, the belligerents are forced into a situation where a peace agreement and subsequent peace is jointly beneficial, since further hostilities are doomed to be mutually detrimental (Zartman, 2000). The theory of ripeness and the mutually hurting stalemate therefore implies that parity between belligerents in terms of strength is needed for a stable peace. The necessary rough power parity for a mutually hurting

stalemate to materialise is depicted by Zartman as a scenario where 'the upper hand slips and the lower hand rises, both parties moving towards equality' (2000, p.228).

The simplicity and accessibility of ripeness perhaps accounts for its popularity as identified by Duursma (2014), who explains that ripeness features heavily in peace process strategy literature aimed at practitioners of conflict resolution. However, despite the ease and theoretical elegance of the concept, scholarly work has found it to be fraught with problems. Some of the strongest criticism comes from Kleiboer (1994) who persuasively argues that ripeness and the mutually hurting stalemate have weak analytical and practical uses. Schrodt, Yimaz and Gerner (2003) attempt to quantitatively assess the explanatory power of ripeness and the mutually hurting stalemate with respect to peace processes of the Balkans, Middle East and West Africa. However, despite numerous operationalisations of the mutually hurting stalemate, they struggle to find evidence of ripeness' relationship with peace. Additionally, O'Kane (2006) critiques ripeness through qualitative methods, assessing the Northern Irish peace process. He explains that in the Northern Irish case, ripeness as characterised by Zartman (2000) has feeble predictive capacity. The failure of ripeness to explain the success of the Northern Irish peace process is especially pertinent due the weakness of the IRA relative to the British government. The absence of what Zartman (2000) construes as requisite parity between the parties did not prevent the Northern Irish case from being a celebrated success of conflict resolution techniques: since the signing of the Good Friday Agreement, the region has enjoyed a remarkably firm negative peace (Gilligan and Tonge, 2019).

Ripeness falls short of being a way to adequately grasp the relationship between rebel strength and post-agreement peace. A different approach is a capability based spoiling perspective. The issue is thus viewed in terms of bargaining, which is understood as

a process where the parties determine how to divide the benefits of joint action. Hence, it would appear natural that a rebel group and a government would be inclined to sign a peace agreement in order to enjoy the rewards of collaboration since fighting is costly and laden with risk to either side (Powell, 2002). However, given that all parties are rational and seeking to maximise their share of benefits from joint action, ambitions of the individual actors may be obstacles to durable peace. A rebel group may spoil an agreement if it can unilaterally pursue a stronger position than one offered through the settlement. This could be expected in a situation where there is a significant discrepancy between the provisions of an agreement and the actual balance of power between a rebel group and a government, to the detriment of the rebels. Rebel disillusionment and disappointment with a peace process is also likely to play a role in a motivating a rebel group to restart armed hostilities. Under such circumstances, the opportunity structure would be such that a rebel group could be incentivised to unilaterally alter the status quo to their advantage by returning to the battlefield (Greenhill and Major, 2007).

A rebel group may be inclined to violently spoil an agreement but the viability of pursuing this option will vary based on the strength of the rebel group. The reason for this is simple: in the context of conflict recurrence, the stronger a rebel group is relative to the government, the greater the likelihood of military victory and the lower the probability of annihilation. A rebel group that is relatively weaker than a government and has signed a peace agreement following some unrest is thus likely to calculate that returning to the battlefield is particularly costly and unlikely to yield favourable results. Accordingly, Werner (1999) argues that belligerents falling into this profile will tend to abide by any peace agreement they are offered and additionally will accept any revisions to it as opposed engaging in spoiling behaviour. This accordant with

Horowitz's (1985, p.241) formulation that factions 'with a keen sense of weakness are easily convinced' and that 'their only hope of resisting domination lies in some form of separation'. By contrast, although uncommon, a rebel group which is relatively stronger than a government has comparatively few reasons to abide by any peace agreement and as a result is very likely to return the battlefield after signing a settlement. Rebel groups of this sort can directly challenge the state government through conventional warfare. Any further armed contest will likely result in greater concessions from the government at a minimum or even outright victory (Clayton, 2013).

Such reasoning is consistent with Clausewitz's (1982) observation that the more restricted an actor's strength, the more restricted its immediate objectives must be. On this point, writers of classical Communist insurgency theory such as Mao (1961) emphasise that rebel groups should determine the viability of pursuing their goals based on their capabilities relative to the state government. The viability of violently spoiling a peace agreement is thus proportional to the relative strength of the rebel group in question. This means that a positive relationship between relative rebel strength and the risk of post-agreement conflict recurrence is expected. Hence, the hypothesis to be evaluated in this study is as follows:

The greater the relative strength of a rebel group, the greater the risk of post-agreement conflict recurrence.

It is useful to clarify on the point of relative rebel parity, which ripeness theory treats as a distinct analytical category with accompanying unique predictions about outcomes. The capability based spoiling perspective presented here treats parity as a middle point on a spectrum. Relatively weak rebel groups characterised by low post-

agreement conflict recurrence risk constitute one extreme and relatively strong rebel groups characterised by high post-agreement conflict risk comprise the other. Accordingly, the risk of post-agreement conflict recurrence for a rebel group of relative parity falls between relatively weaker rebel groups and relatively stronger rebel groups.

Disaggregated Mechanisms

An additional objective of this study is to disaggregate rebel strength and to examine how the hypothesis presented above works through specific mechanisms. This study understands those components identified by Cunningham et al. (2013) as facets of overall rebel strength. To this end, a rebel group's ability to procure arms, ability to mobilise popular support and fighting proficiency are considered as the elements which comprise overall rebel strength.

Considering the ability of a rebel group to procure arms is crucial when examining the relationship between rebel strength and post-agreement conflict risk. While some select rebel groups may have access to cutting edge weaponry, others may find it problematic to obtain even the most basic light arms. This variation should have a direct effect on a rebel group's strength. Typically, rebel groups are weaker than the government they are in contention with. One of the main factors which makes this asymmetry a commonality is that government forces enjoy access to sophisticated weaponry, courtesy of the international arms market (Krause, 1995). For a rebel group to even stand a chance in military confrontation with state forces, they must make a 'quantum leap' in both the quantity and quality of their arms (Nepali and Subba, 2005, p.106). Another point to consider is the fungibility of weapons for a rebel actor. Sawyer, Cunningham and Reed (2017) argue that weapons, especially small arms, are highly fungible since they can be easily traded by rebels to secure various other resources

that are crucial for the continued operation of the group. On this point, they invoke the example of Côte d'Ivoire's The Forces Novelles, who have exchanged arms for food. They also describe that rebel groups in Liberia have traded guns across the Côte d'Ivoire border for motorbikes. A rebel group having a higher capacity to procure arms is therefore not only more adept at challenging the government militarily, but it also endows the rebels with a type of item which under dire circumstances can be traded for other supplies that help sustain insurgent activities.

Rebel groups can procure arms through a variety of ways, from either internal or external sources. Externally speaking, whether the rebel group is supported by an external patron is associated with arms procurement abilities. A case in point is RENAMO's backing from South Africa's apartheid government. Emerson (2013) emphasises that Pretoria's direct support throughout the 1980s was the crucial ingredient that transformed RENAMO into a serious military threat to Frelimo. In one 1996 interview, leader of RENAMO Dhlakama highlighted that the South Africans were an indispensable source of small arms for the organisation. Beyond simply directly providing a rebel group with armaments, an external supporter can help in other less obvious ways. For example, very few rebel groups are able to take advantage of the international arms market, with access being reserved for only the most well organised groups such as the Palestinian PLA or the Sri Lankan LTTE (Jackson, 2010). External support from an internationally legitimate government can provide a veneer of legality for a rebel group to access this source and be of assistance with logistical quandaries such as how to ensure safeguards over delivery. Furthermore, whether a rebel group is capable of taking advantage of smuggling networks will have a significant effect on arms procurement from external sources. One technique prevalent in Africa is smuggling small arms along coasts and rivers. In the Horn of Africa, smugglers that

operate in the Gulf of Aden use specially designed wooden vessels with large hulls to shift large quantities of rifles from Yemen into the hands of Somalia's warlords (Schroeder and Lamb, 2006).

Rebel arms procurement occurs more commonly internally, with the most typical source being leakage from a government's arsenal. This is made possible due to factors such as disorganisation, weakness or collapse of the state. Marsh (2007) explains that the most significant determinant of arms availability for rebel groups is the ability of state forces to defend their weapons stockpiles. Rebels acquiring weaponry in this manner are transformed in terms of their military strength by obtaining types and quantities of arms that in other circumstances would be too difficult to transport or too expensive to purchase (Sislin and Pearson, 2001). For example, the Malian MPA began rebellious activity in the early 90s armed exceptionally poorly, reflected in a heroic mythology that the group began their insurgency armed with nothing more than knives (Humphreys and ag Mohamed, 2003). As the conflict evolved, they were able to obtain increasing amounts of weapons from unsecured government stockpiles, eventually allowing them to challenge government forces in direct confrontations. The availability of weapons from the Malian state's leaking arsenal vastly increased the MPA's strength as a rebel organisation (Bevan, 2005). Another example is that of the Chechen rebels in their plight against the Russian government. The Chechens were able to initially arm themselves from weapons caches that had been left over from the jumbled departure of Soviet units following the collapse of the USSR. The Chechen forces were able to resupply themselves with more weapons, ammunition and even transport vehicles from Russian stockpiles. Perhaps due to complacency, Russian forces were completely unprepared to ensure

the security of their weapon depots from the opportunistic Chechens (Dilegge and Konynenburg, 2002).

Rebel ability to mobilise popular support is another facet of overall rebel strength which may influence post-agreement conflict risk. A requisite for a rebel group initiating and sustaining any insurgent operations is a continuous stream of new recruits. There is significant variation on this factor, since some rebel organisations appeal to a small cohort of the wider population whereas others will be able to entice a comparably large segment of society (Olzak, 2006). The ability of a rebel group to mobilise support has a direct impact on the number of fighters that the group can mobilise against the state government. Weinstein (2005) proposes that rebel groups have a mixture of economic and social endowments which ultimately determine their ability to mobilise popular support. He explains that rebel groups which are high on both types of endowment have the greatest capacity for obtaining new recruits whereas those which are low on both dimensions will face the most arduous task of attracting support for their cause.

Economic endowments refer to material supplies which can be utilised to satisfy the logistic requisites of organising insurgent action. They allow a rebel leadership to attract potential recruits through short term rewards. For some rebel groups, they are able to reap the economic benefits of taxing a local populace, a generous external patron, extracting and selling natural resources or conducting some sort of profitable criminal enterprise (Weinstein, 2005). Such economic resources can be mobilised and transformed by the rebel group into incentives for prospective members to join their ranks (Le Billon, 2001). For example, RENAMO was fortunate to be well supplied by the Rhodesian government. All new recruits joining the group were given shelter, clothing, food, weaponry and even regular salaries. These material incentives greatly catalysed the rapid growth of RENAMO (Vines, 2013).

Social endowments include factors such as behavioural norms, common belief systems, shared expectations and communal trust. These may derive from shared religion, ethnicity or cultural identity. As Weinstein (2005) explains, social endowments provide for a generalized reciprocity among group members. This allows rebel leaders to make promises of future material rewards once the state government has been overthrown. These pledges have a certain level of credibility based on the social endowments of the group. This technique for procuring popular support is especially useful for rebel groups who are low on economic endowments. An illustrating case is the EPLF of Eritrea, who pursued ambitions of autarky. The EPLF found itself in a position where the only way to muster popular support was to make many promises about what an EPLF victory would bestow on its membership, made possible by the group's large social endowment (Woldemikael, 1991).

The third component of rebel strength to be considered in this study is the fighting proficiency of the rebel group. The membership of a rebel group may exhibit substantial variation in terms of how effective they are at fighting. Some rebel groups have fighters that perform more strongly than one would expect based purely on their numbers. Millet, Murray and Watman (1986, p.37) define fighting proficiency as 'the process by which armed forces convert resources into fighting power'. Two determinants of rebel fighting proficiency are how well trained the rebels are and how adaptable they are in their choice of tactics.

Some rebel groups may be able to obtain sophisticated military hardware to fuel their rebellious efforts. However, often such weaponry remains unused due to lack of training and knowhow. For example, the Sudanese SPLA was able to capture tanks and armoured personnel carriers on many occasions, yet they largely remained idle since the group lacked the knowledge and skills to operate such vehicles.

Mozambique's RENAMO experienced similar difficulties and employed nothing larger than motorbikes for transportation despite capturing heavily armoured vehicles on many occasions (Young, 1996). In both cases, if SPLA and RENAMO fighters were trained such that they had the expertise to operate sophisticated military hardware, it would have increased the overall threat these organisations posed when challenging government forces.

Rebel fighters must also be able to adjust to changing circumstances in order to be more effective in conflict. One example is how many rebel groups incorporate improvised explosive devices (IEDs) into their playbooks. For example, Boko Haram have utilised IEDs extensively throughout their insurgency. Initially, the group was raiding convoys of the Niger army through direct firefights, often resulting in heavy casualties. In order to adapt, Boko Haram expanded their tactics to include IEDs which would be placed at the roadside, substantially reducing the risk associated with attacking an enemy convoy (Onuoha, 2014). As the insurgency developed, so too did the complexity of the IEDs which were initially triggered with a wired connection but then became remotely controlled by a wireless signal. Ways of camouflaging the IEDs to make them virtually undetectable also substantially improved over time. Developing methods of this sort has a requisite of technical skill since the rebels must construct and program the devices themselves. A degree of innovation is also necessary to create new tactics that do not succumb to the drawbacks of the old ones.

Ability to procure arms, ability to mobilise popular support and fighting proficiency all influence the relative rebel strength of a rebel group. A particular rebel group may be moderate in one of these dimensions and low in the other two whereas for a different rebel group, the opposite may be the case. These two hypothetical rebel groups may simply be categorised as 'weaker' in terms of an aggregated, overall index of relative

rebel strength. By disaggregating rebel strength and quantitatively analysing each of these three mechanisms, a more granular understanding concerning the relationship between relative rebel strength and post-agreement conflict risk can be achieved. Quantitative analysis with this kind of disaggregation is made possible with the Non-State Actors in Armed Conflict Dataset (Cunningham et al., 2013), which quantifies overall relative rebel strength in addition to these three disaggregated mechanisms for each rebel group.

4: Research Design

Data Composition and Structure

The data are from the Peace Research Institute Oslo (PRIO) and the Uppsala Conflict Data Program (UCDP). The dataset used in this study has been constructed through merging three datasets together, namely Nilsson's Dyadic Dataset (2008), the Non-State Actors in Armed Conflict Dataset (NSA) (Cunningham et al., 2013) and the UCDP Peace Agreement Dataset (Pettersson, Högbladh and Öberg, 2019). These three datasets are compatible with each other since they use the same identification codes for each individual internal armed conflict and dyad. Nilsson's (2008) Dyadic Dataset bears the advantage of being appropriately structured for survival analysis with time dependent independent variables.

The dataset used in this study uses post-agreement dyad year as its unit of analysis, with the observation period spanning 1989-2004. It is therefore essential to define what is meant by a dyad and also what is meant by internal armed conflict. The UCDP (2019) defines internal armed conflict as a disputed incompatibility with respect to territory, government or both. This contestation occurs between a government and a respective domestic oppositional organisation and must reach a threshold level of 25 battle-deaths within a one-year period to qualify. These internal armed conflicts are comprised of one or a multitude of dyads, whereby a dyad consists of a government and one rebel group that have engaged in hostilities also reaching the threshold of 25 battle-deaths in a one-year period. To illustrate, if a government is opposed by three rebel groups that have taken up armed violence over the same incompatibility, then the internal armed conflict consists of three dyads each relating to a unique government-rebel pairing.

The dataset includes 451 observations. A dyad is at risk of experiencing armed conflict following the signing of a peace agreement during the observation period until its end on December 31st, 2004. Dyads drop out of the risk set if they experience armed conflict after a settlement has been signed and can re-enter on the condition that a new peace agreement is reached. In many cases, dyads sign several peace agreements over the course of a conflict. Some of these are signed when the dyad is already at peace. In an effort to avoid underestimating conflict resumption risk, subsequent agreements in the context of peace are treated as replacing the one prior. The dataset is composed of 78 dyads which may or may not have engaged in internal armed conflict following peace agreement signing. Since the unit of analysis is post-agreement dyad year, there are multiple observations for each dyad. For example, the Government of Israel and Fatah signed the Oslo Agreement in 1993. Following the agreement's signing, this dyad enjoyed peace until the year 2000 whereby conflict between Fatah and the Government of Israel resumed. For the Government of Israel – Fatah dyad, there are seven observations in the dataset with each one representing one post-agreement dyad year until conflict resumption, after which the dyad drops out of the risk set.

Those peace agreements which sought to partially or fully settle the incompatibility of an internal armed conflict are considered. Peace process agreements are excluded on the basis that they are simply outlines of a process to regulate incompatibility as opposed to taking direct steps to settle it. As such, peace process agreements are considered sufficiently distinct from full or partial peace agreements and are therefore omitted. Additionally, all peace agreements considered were signed by dyads that were in violent conflict prior to an agreement. This means that at a point in time, the government and rebel group that comprise the dyad exhibited the motivations and

means to utilise armed violence. Consequently, the dataset includes all peace agreements that were signed by one or more formerly warring dyads during the observation period of 1989-2004 which attempted to at least partially resolve the incompatibility that accompanied the respective internal armed conflict.

Dependent Variable

The dependent variable *'failure'* measures whether in a particular post-agreement dyad year, a government and rebel group that comprise a respective dyad engaged in armed conflict. This is coded 1 if armed conflict did occur in the relevant post-agreement dyad year and 0 if it did not. In total there are 55 failures in the dataset. Post-agreement armed conflict is measured from the year after the peace agreement was signed. The data for this variable is taken from Nilsson's Dyadic Dataset who constructed her dataset using UCDP data. The necessity to measure conflict occurrence as of the year following the signing of an agreement is brought on by the limitations of the UCDP data, since the UCDP measures dyadic conflict behaviour on the level of dyad-year. With such data, the only way to be confident that post-agreement conflict occurrence did in fact occur after a peace agreement is to measure for its occurrence from the year after the peace agreement has been signed. In other words, if an agreement has been signed in a particular year and the dyad which signed the agreement also engaged in violent conflict in the same year, without granularity beyond the level of dyad-year there is no way of knowing whether the violence occurred in the pre or post settlement period. The lowest amount of time between a dyad signing a peace agreement and post-settlement conflict occurrence in the dataset is accordingly one year.

Independent Variables

Rebel strength is the key aspect of this study. Data for all independent variables concerned with rebel strength originate from the NSA dataset. The first variable *'strength'* is an interval variable with 4 levels. It is an overall measure of rebel strength, relative to the government that rebel group is in contention with. It is coded 1 if the rebel group was much weaker than the government, 2 if the rebel group was weaker than the government, 3 if the rebel group was on parity with the government and 4 if the rebel group was stronger than the government. This independent variable is time dependent, meaning that its values are specific to a point in time. For example, between 1993 and 1997 UNITA is coded as having been on parity with the Angolan government in terms of strength whereas between 1998 and 2002 it is coded as having been weaker. Since post-agreement dyad year is the unit of observation, it is possible to account for the temporal specificity of relative rebel strength.

In addition to overall relative rebel strength, three disaggregated measures are considered. The first of these is *'strength: arms'* which is a binary variable that captures how capable the rebel group is at procuring arms relative to the government. It is coded 1 if the rebel group's arms procurement capabilities are moderate and 0 if they are low. The second is *'strength: mobilisation'* which is a binary variable that measures the ability of a rebel group to mobilise popular support relative to the government. It is coded 1 if the rebel group's mobilisation capabilities are moderate and 0 if they are low. The third is *'strength: fighting'* which captures how proficient the rebel group is at fighting, relative to the government. It is coded as 1 if the rebel group's fighting proficiency is moderate and 0 if it is low.

For all three disaggregated indices of rebel strength, the NSA dataset also codes a third 'high' level. However, these are extremely rare in all three disaggregated variables. For the purposes of this study the high level of all three disaggregated variables has been combined with their moderate level. The number of such high observations that have been combined with the moderate level are 8, 6 and 3 for *'strength: arms'*, *'strength: mobilisation'* and *'strength: fighting'* respectively out of a total of 451 observations. As with the generic *'strength'* variable, all three disaggregated measures of relative rebel strength are time dependent.

Control Variables

To ascertain that the results attained are not spurious, a number of control variables are introduced to the models. The control variables used in this study are factors that have been identified by previous research to influence peace stability and could subsequently influence the dependent variable or the independent variables.

Jarstad and Nilsson (2008) as well as Buhaug, Gates and Lujala (2009) have argued that conflicts fought over territory have lower prospects for peace compared conflicts fought over control of the government. The control variable *'incompatibility'* is therefore coded 1 if the dyad was in conflict over territory and 0 if it was in conflict over government.

Research from Hartzell and Hoddie (2003) suggests that peace agreements which include provisions for power sharing institutions heighten the durability of post-settlement peace. As such, the control variable *'power sharing'* is coded 1 if a peace agreement contained a minimum of one pact that accommodated power sharing territorially, politically or militarily and 0 if it did not contain any power sharing stipulations.

Nilsson (2008) has shown that if a rebel group is excluded from a peace agreement then the risk of this rebel group engaging in armed conflict increases. Resultantly, the control variable *'excluded'* is coded 1 if in a particular year a dyad was excluded from a peace agreement that was signed by other dyads in the same conflict and coded 0 if the dyad was not excluded.

Although counter-intuitive Mason, Weingarten and Fett (1999) argue that the duration of a conflict is positively associated with the stability of post-conflict peace. The control variable *'dyad duration'* measures the number of years from when a dyad reached the threshold of 25 annual battle deaths. This may be from before the observation period begins in 1989.

Hartzell, Hoddie and Rothchild (2001) have quantitatively shown that conflicts of greater intensity have lower chances of a durable post-conflict peace. The control variable *'dyad intensity'* is coded 1 if a dyad had previously reached the level of war (more than 1000 annual battle deaths) and coded 0 otherwise.

Doyle and Sambanis (2000) explain that greater numbers of warring parties can make peace more fragile. The control variable *'number of parties'* measures the number of warring parties active in the conflict involving the respective dyad since the beginning of the observation period in 1989 up until a particular year.

Walter (1997) has famously argued that without an external guarantor, domestic actors are likely to find themselves in a credible commitment dilemma. Therefore, third party mediation could have a positive effect on post-agreement peace duration. The control variable 'mediation' is coded 1 if a peace agreement was mediated by one or more third parties and 0 if it was not.

Fortna (2003) contends that the quality of a peace agreement is related to the longevity of post-conflict peace. Specifically, she explains that those agreements which address the underlying incompatibility of the conflict lead to particularly durable peace. Therefore, the control variable *'agreement type'* is coded 1 for what the UCDP recognizes as full agreements, meaning those which agree to settle the whole incompatibility. It is coded 0 for what the UCDP recognizes as partial agreements, meaning those which agree to settle part of the incompatibility.

The source of data for *'incompatibility'*, *'power sharing'*, *'excluded'*, *'dyad duration'*, *'dyad intensity'* and *'number of parties'* is Nilsson's Dyadic Dataset whereas for *'mediation'* and *'agreement type'* the source of data is the UCDP Peace Agreement Dataset.

Statistical Technique

Interest lies in the length of time between peace agreement signing up until the point where a dyad experiences conflict recurrence. Duration analysis is carried out utilising a Cox proportional hazards model (Cox, 1972) which has the advantage of not assuming a specific parametric form for the distribution.

In some cases, dyads may experience post-agreement violence more than once. For example, between 1989 and 2004 in Liberia, the INPFL have signed numerous peace agreements with the government of Liberia. The two sides have engaged in violence with one another after more than one of these peace agreements. The risk of post-agreement armed conflict therefore develops in a sequential manner. Stated differently, the risk of a dyad engaging in post-agreement armed conflict a second time does not begin until post-agreement armed conflict has already occurred once in the past and a second peace agreement has been signed. In order to be able to handle

such sequential repeated events, the Cox proportional hazard modelling utilised in this study clusters on dyad and stratifies on failure order. This is an approach known as a conditional time gap model, as discussed by Box-Steffensmeier and Jones (2004, pp. 158-162).

It is necessary to check that the proportional hazards assumption is satisfied to be confident of the suitability of the Cox proportional hazards model for the empirical analysis of the data. This was assessed with a Grambsch and Therneau (1994) global test as well as with the Harrel's rho (1986) for each variable, as recommended by Box-Steffensmeier and Jones (2004, p.135). These tests are based on scaled Schoenfeld residuals. Unfortunately, although none of the tests of the independent variables showed evidence of proportional hazards violation, in each of the models the global test was violated as well as with some of the tests concerning individual control variables. This problem has been addressed in a way consistent with that of Nilsson (2008, p.492) who encountered the same problem. Accordingly, the violated control variable *'excluded'* was interacted with the logarithm of time, in this case referring to dyadic peace duration, and added as a new variable to each of the models. This is also the methodological procedure recommended by Box-Steffensmeier and Jones (2004, p.136) in circumstances where proportional hazards tests are violated. None of the global and variable-specific tests then showed evidence of proportional hazards violation in any of the models. The results of these new models are nearly identical to the models without the interaction of *'excluded'* and the logarithm of time. As such, the models reported below in Table 1 are the original models without this interaction variable.

5: Results and Analysis

Results from the inferential statistical analysis are presented in Table 1. For descriptive statistics, see Table 2 in the appendix. All the models report hazard ratios instead of the coefficients. A hazard ratio is defined as the exponential of the coefficient. Hazard ratios greater than 1 signify an increase in post-agreement conflict recurrence risk whereas those below 1 signify a decrease in post-agreement conflict recurrence risk. To demonstrate, a hazard ratio of 1.3 indicates that the risk of a dyad experiencing post-agreement conflict is increased by 30% when the independent variable in question increases by one unit. Alternatively, a hazard ratio of 0.5 means that the risk of a dyad experiencing post-agreement conflict is decreased by 50% when the respective independent variable increases by one unit.

The hypothesis presented prior predicts that as relative rebel strength increases, so too does the risk of post-agreement conflict. The results are consistent with this prediction, as shown in Model 1. The variable '*strength'* shows that a one unit increase in relative rebel strength increases a dyad's risk of post-agreement armed conflict recurrence by 59.6%, which is statistically significant at the 0.05 level. This finding supports the capability-based spoiling perspective presenting earlier, whereby the viability of violently spoiling an agreement with the hope of obtaining more favourable circumstances increases with relative strength. Regardless of whether they are satisfied with the terms of a peace agreement, a relatively weaker rebel group is likely to abide since a return to violence may result in further defeats at the hand of government forces. On the other hand, a relatively stronger rebel group that is dissatisfied with the provisions of an agreement has the capability to engage in violent spoiling. Violent spoiling by a relatively stronger rebel group is likely to yield greater concessions or even outright military victory.

Table 1. *Post-settlement conflict risk, rebel strength and disaggregated mechanisms.*

	Model 1	Model 2	Model 3	Model 4
Strength	1.596** (2.303)			
Strength: arms		1.816** (2.158)		
Strength: mobilisation			0.979 (0.069)	
Strength: fighting				1.072 (0.240)
Incompatibility	1.902* (1.714)	2.101** (2.022)	2.287** (2.264)	2.255** (2.354)
Power sharing	0.504** (1.961)	0.440** (2.366)	0.575 (1.568)	0.564 (1.582)
Excluded	1.460 (1.023)	1.157 (0.371)	1.486 (1.049)	1.470 (0.991)
Dyad duration	0.998 (0.089)	0.998 (0.080)	0.992 (0.354)	0.993 (0.321)
Dyad intensity	0.694 (1.056)	0.677 (1.044)	0.851 (0.419)	0.826 (0.495)
Number of parties	1.132 (0.988)	1.084 (0.640)	1.013 (0.110)	1.020 (0.158)
Mediation	1.275 (0.703)	1.403 (0.941)	1.377 (0.888)	1.373 (0.882)
Agreement type	0.843 (0.583)	0.832 (0.663)	0.721 (1.144)	0.734 (1.030)
Observations	451	451	451	451
Failures	55	55	55	55
Log likelihood	-177.864	-178.517	-179.939	-179.922

Models all utilise Cox proportional hazard modelling estimated with R using the 'survival' package (Therneau, 2019), with hazard ratios as opposed to coefficients being reported. Robust z statistics are given in parentheses, clustered on dyad. Two tailed testing is used.
*** p<0.01, **p<0.05, *p<0.1.

Figure 1. *Comparison of survival curves for levels of rebel strength.*

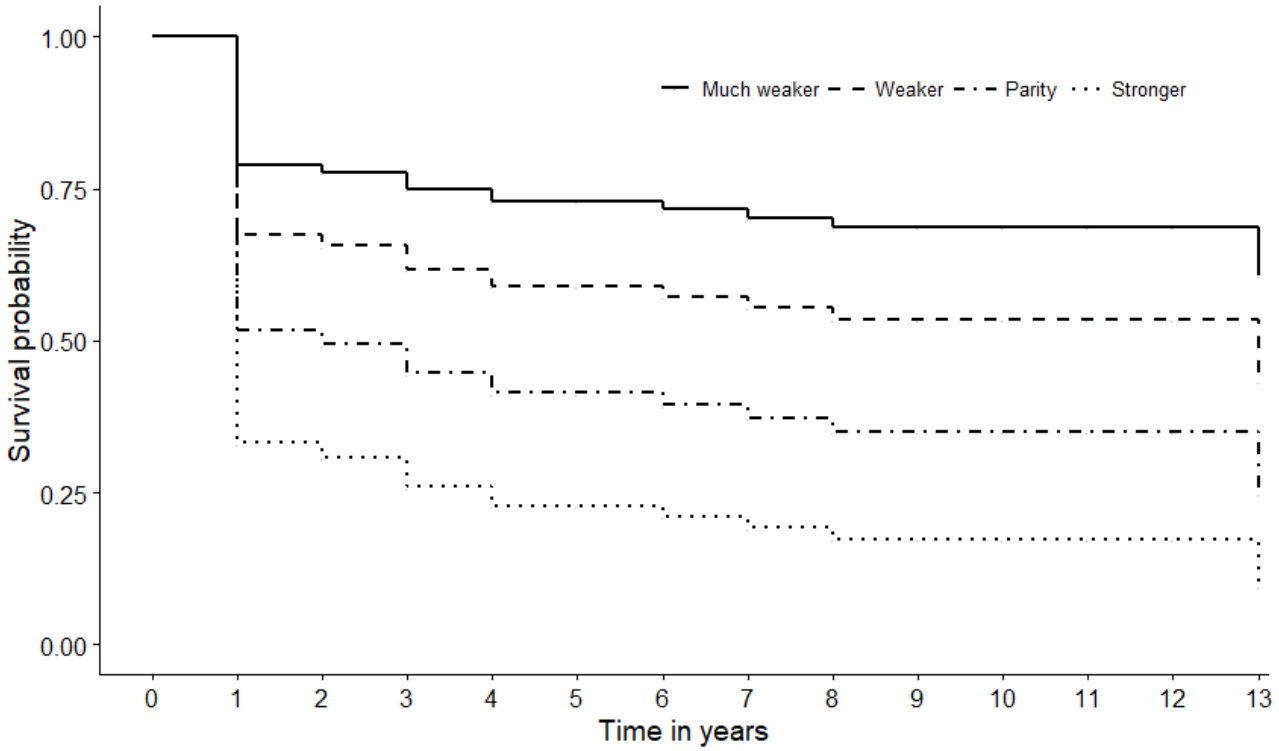
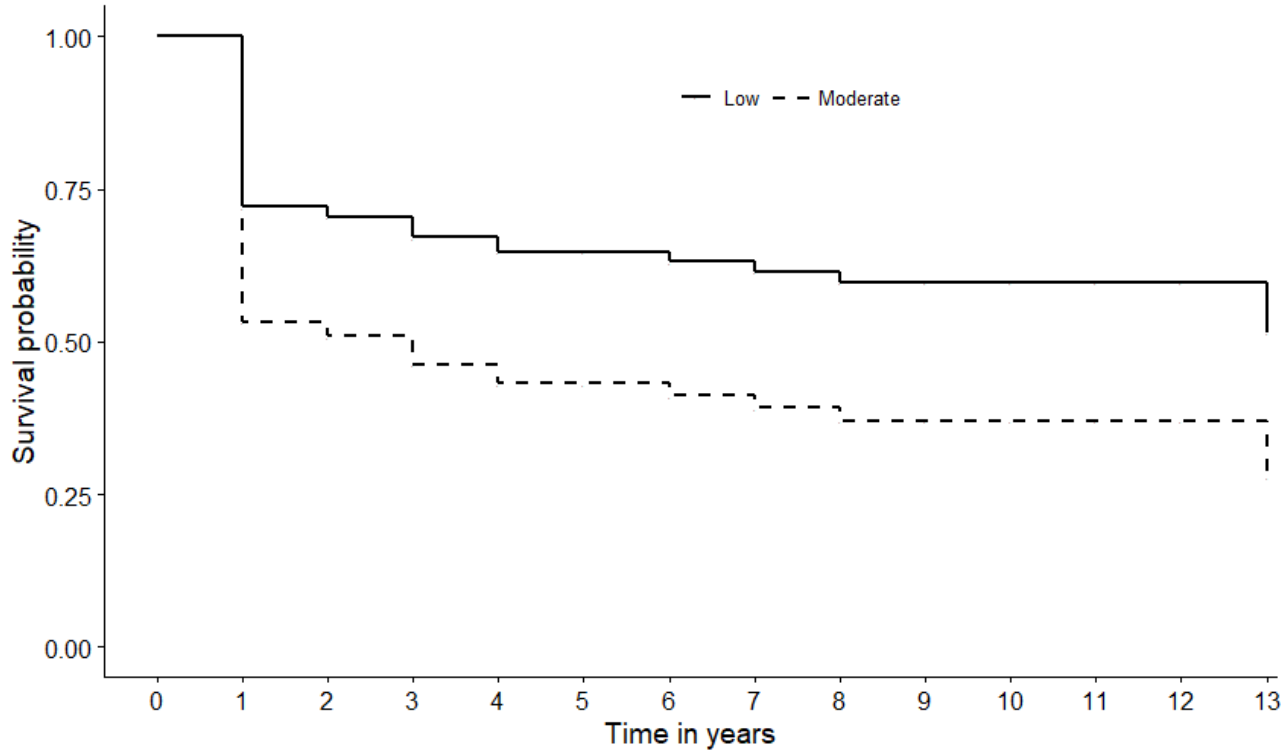


Figure 2. *Comparison of survival curves for levels of arms procurement.*



Survival curves are plotted in R using the 'survminer' package (Kassambara et al. 2019). For Figures 1 and 2, binary control variable are set to their medians and continuous control variables are set to their means: *'incompatibility'* is set to 1, *'power sharing'* is set to 1, *'excluded'* is set to 0, *'dyad duration'* is set to 11, *'dyad intensity'* is set to 0, *'number of parties'* is set to 4, *'mediation'* is set to 1, *'agreement type'* is set to 1.

In addition to assessing whether relative rebel strength influences post-agreement conflict risk, an additional objective of this study was to disaggregate the independent variable to identify causal mechanisms. The results of the disaggregated analyses are presented in Models 2, 3 and 4. The variable *'strength: arms'* shows that a rebel group which is moderate in its ability to procure arms increases a dyad's risk of post-agreement conflict recurrence by 81.6% compared to a rebel group which is low on this dimension. This effect is statistically significant at the 0.05 level. The other two disaggregated variables, namely *'strength: mobilisation'* and *'strength: fighting'* have almost non-existent effects, both of which are statistically insignificant at all conventional levels of significance. Rebel ability to mobilise popular support and rebel fighting proficiency are thus found to have no association with post-agreement conflict recurrence risk. These results suggest that the primary determinant of whether or not a rebel group can viably violently spoil a peace agreement is a sufficient ability to obtain weaponry. Therefore, it can be expected that post-agreement conflict risk increases in tandem with factors such as a rebel group having access to smuggling networks, being supplied with weapons courtesy of an external patron or taking advantage of unsecure government stockpiles.

The effect of rebel strength and arms procurement can be illustrated graphically. Survival curves in Figures 1 and 2 illustrate the proportion of dyads at each level of rebel strength or arms procurement that have not experienced post-agreement armed conflict at a particular point in time. These survival curves are generated by fixing the binary control variables to their medians and the continuous control variables to their means and then varying the independent variable of interest. Binary control variables are set to their medians to avoid the issue of fixing the control variables to values which do not refer to any real cohort. For example, the mean of *'incompatibility'* is 0.612,

whereby 0 refers to a dyad that has fought over government and 1 refers to one that has fought over territory. As Thomsen et al. (1991) have pointed out, values such as the mean of *'incompatibility'* do not refer to a real subject. In order to avoid this issue and for ease of interpretation, survival curves are plotted with binary control variables being fixed to their median values.

Figure 1 illustrates that post-agreement peace is more durable for dyads involving weaker rebel groups. After 13 years (the duration of the observation period) for a dyad where the rebel group is much weaker, weaker, on parity or stronger, the probability that post-agreement peace endures is 62%, 47%. 25% and 12% respectively.

Figure 2 illustrates that dyads where rebel groups have a low ability to procure arms enjoy more durable peace than those where rebel groups have a moderate ability to procure arms. After 13 years, for a dyad where the rebel group has a low ability to procure arms, the probability of post-agreement peace enduring is 54% as opposed to 33% for dyads where the rebel group has a moderate ability to procure arms.

Fixing the control variables at different values returns different survival rates. In Figures 1 and 2, *'power sharing'* is fixed to 1, referring to the peace agreement which was signed containing at least one pact that accommodated power sharing. By fixing this to 0, referring to the peace agreement containing no power sharing provisions, all survival rates drop considerably. After 13 years for agreements with no power sharing provisions, dyads containing much weaker, weaker, on parity and stronger rebel groups saw post-agreement peace endure in 38%, 20%, 10% and 2% of cases, respectively. Dyads containing rebel groups which had a low and moderate ability to procure arms saw peace endure in 7% and 1% of cases over 13 years, respectively. The survival curves for a scenario where the peace agreement has no power sharing

provisions are displayed in Figures 3 and 4 in the appendix. Indeed, the variable *'power sharing'* is negatively associated with conflict recurrence risk in all four models presented in Table 1. This negative association is statistically significant in Models 1 and 2, where an agreement containing power sharing is associated with a roughly 50% decrease in the risk of post-agreement conflict, compared to one with no power sharing provisions. These findings are consistent with the research of Hartzell and Hoddie (2003), who explain that power sharing measures increase the durability of post-settlement peace.

By fixing *'incompatibility'* to 0, referring to dyads which signed an agreement in the wake of conflict over government, survival rates improve compared to agreements signed in the context of a conflict over territory. After 13 years, dyads which signed peace agreements in the wake of conflict over government comprised of much weaker, weaker, on parity and stronger rebel groups saw post-agreement peace endure in 77%, 67%, 48% and 31% of cases respectively. Dyads containing rebel groups which had a low and moderate ability to procure arms saw peace endure in 73% and 61% of cases over 13 years, respectively. The survival curves for a scenario where a peace agreement is signed in the wake of conflict over government are displayed in Figures 5 and 6 in the appendix. The variable *'incompatibility'* is statistically significant at the 0.05 level in 3 of the models and marginally significant at the 0.1 level in one of the models. The hazard ratios suggest that a dyad which signs a peace agreement following a territorial as opposed to a governmental incompatibility is roughly doubly at risk of experiencing post-agreement conflict. The works of Jarstad and Nilsson (2008) as well as Gates and Lujala (2009) are therefore supported, who argue that conflicts which are fought over control of a territory have lower peace prospects than those which are fought over control of the government.

The results of the empirical analysis are firmly consistent with the central hypothesis that greater relative rebel strength increases post-agreement conflict risk. Additionally, the results suggest that this relationship rests on rebel ability to procure arms. These results are also robust to a variety of different model specifications such as clustering on peace agreements, conflict or country. Conducting the analysis with a Weibull model or de-stratifying by event order also returns the same main results.

The NRA and Fatah

The cases of the NRA in Uganda and Fatah in the Israeli-Palestinian crisis serve to illustrate the findings. Both cases exemplify how the ability of a rebel group's ability to procure arms increases rebel military strength which in turn heightens post-agreement conflict risk. Weaponry gives rebel groups the capability to unilaterally act upon dissatisfaction with either the provisions or implementation of a peace agreement. In Both the Ugandan and Israeli-Palestinian a complex combination of issues contributed to post-agreement armed conflict. Nevertheless, there is strong evidence that post-agreement conflict occurred in tandem with an escalation of weapons availability in both examples.

The National Resistance Army (NRA) emerged in 1981 and took up arms against the newly elected Ugandan government of Milton Obote. This unrest was fuelled by claims that the late 1980s elections had been rigged and therefore Obote's government was illegitimate (McDonough, 2008). The NRA was in a constrained environment since there was no significant regional black market and additionally no super-power interest in the region, making acquisition of weapons and other supplies difficult. In the group's early stages, the NRA was organised into small units with very few arms between them. Some of their first operations were with the sole objective of procuring small

arms and light weapons. This was done through carefully planned attacks on government targets which were likely to store government armaments such as military convoys, police stations or isolated military facilities. These hit and run tactics were what the NRA relied on for arms and ammunition (Ngoga, 1998).

The NRA took advantage of disaffected southern Uganda to rapidly expand its ranks in opposition to Obote's government. A greater membership necessitated more weaponry for new members to become fully fledged NRA fighters. In 1993, the NRA had 4000 combatants but only 500 weapons between them. The primary limitation of their military ability was therefore the amount of weaponry under the group's control. To adapt to their growing size, the NRA formed a mobile brigade whose sole purpose was pursuing more dangerous and aggressive arms procurement efforts, headed by the brother of Yoweri Museveni (Katumba-Wamala, 2000). One of the more ambitious missions was the 1984 attack on the Masindi military barracks, which was relatively well defended. Only half of NRA members who carried out the Masindi raid were armed, with the other half instructed to equip themselves with what they find should the raid be successful. This risk laden mission yielded around 900 rifles for the NRA, more than doubling the quantity of weapons under the rebel's control overnight (Kato, 1985).

Ugandan government forces were poorly prepared to adapt to the NRA's hit and run tactics. Resultantly the rebel group was able to substantially increase in strength throughout Ugandan Bush War, largely afforded by well-planned raids on government stockpiles that continuously expanded NRA armaments. Following a coup on Obote's government in July 1985, negotiations began between the NRA and the Ugandan government. The Nairobi negotiations were focused on the development of a power sharing formula with the goal of ending hostilities and political instability in the country.

Museveni and the NRA were clearly dissatisfied with the premise of the negotiations and showed little commitment to any power sharing solution. Museveni repeatedly denounced Uganda's former regimes as backward and primitive throughout the talks and would consistently change his position on fundamental agenda items, derailing the productivity of the process. He would also reintroduce issues that had supposedly already been resolved, substantially drawing out the negotiations (Tindigarukayo, 1988).

In spite of an exceptionally arduous negotiating process, the Nairobi Agreement was signed in December 1985. However, the NRA violated the ceasefire almost immediately. By early 1986, the NRA had taken Kampala and Museveni was swiftly sworn in as the 9th President of Uganda. The power sharing solution of the Nairobi Agreement was inconsistent with the NRA's vision of forging a new Uganda without the political order of the past. The group thus had ample incentives to violently spoil the Nairobi Agreement in order to unilaterally alter the status quo in their favour. As Lucima (2002) observes, the fact that the NRA had the military strength to achieve an absolute victory makes it unlikely that any settlement could have prevented further bloodshed. The NRA's strength therefore gave the rebel group the capability to pursue violent spoiling of the Nairobi Agreement to further their interests. Well strategized hit and run tactics with the objective of arms procurement were a critical factor which facilitated the NRA's growth as a military entity. This that made returning to the battlefield a viable option.

Another illustrative example is that of Fatah, who signed the Oslo Agreement with the government of Israel in 1993. The spirit of the agreement was based on the notion that the antagonistic history between the Palestinians and Israelis was an insuperable barrier for conventional negotiating and needed to be reconceptualised around

common objectives, dialogue and fairness. Fatah became the staunchest proponent of the arrangement on the Palestinian side, whose leaders made significant efforts to emphasise the benefits of the peace process to the wider Palestinian public. Indeed, Pundak (2001, p.34) observes that in wake of the 1993 Oslo Agreement, Fatah was the 'cornerstone' of Palestinian support for peace.

Ironically, it was in the years following the Oslo Agreement that the Palestinians were able to vastly improve their ability to procure arms. In addition to the 1993 Oslo Agreement, Oslo II of 1995 contained provisions that allowed the Palestinian Authority to arm a police and security force with one rifle for every two personnel. The circulation of illegal weapons which did not subscribe to the armament provisions made in the Oslo Accords began to escalate. Boutwell (2002) reports that the Palestinian leadership would make meagre efforts to enforce the terms of the Oslo Accords concerning weaponry. In some cases, Palestinian leaders were directly involved in smuggling operations which they were supposed to be curtailing. Opaque monitoring mechanisms created a blurry boundary between what was considered legal and illegal. From the Palestinian perspective, weapons came to be seen as legitimate and therefore of moral legality if they were used to resist the Israeli state (Strazzari and Tholens, 2010).

Smuggling operations became more sophisticated throughout 1990s. Weapons smugglers used specially designed boats made from rubber to cross the dead sea and also disguised themselves as fishing crews ostensibly coming south from Lebanese waters to the Gaza coast. Additionally, tunnels were burrowed underneath the Rafah border crossing between Egypt and Gaza for weapons smuggling efforts and for the movement of more traditional supplies such as medicine (Shamir and Hecht, 2014). The result was that by the late 1990s Palestinian society was thoroughly militarised

with small arms and light weapons, with one estimate being that there were as many as 15,000 illegal weapons under Palestinian control in 1998 (Boutwell, 1998).

It was in the context of a Palestinian society which had become thoroughly militarised that in the latter half of the 1990s the Fatah leadership began to lose faith in the Oslo peace process. Factors that contributed to the disillusionment included Israel not leaving the territories which were supposed to be transferred to the Palestinians, continued confiscation of land for new Israeli settlements in the West Bank and delayed permission to build an airport in Gaza (Pundak, 2001). The Israeli government was increasingly behaving in an arrogant and dismissive manner towards the Palestinian public and their leaders, completely undermining faith in any sort of peace process. The humiliation the Palestinians felt in combination with the ubiquity of weaponry in Gaza and the West Bank meant that only a spark was needed for armed conflict to erupt towards the end of the 1990s and for the Oslo peace process to completely implode. This came in the form of two events. The first was the complete breakdown of the Camp David Summit, whereby Yasser Arafat and Ehud Barak were mutually intransigent on issues of territory, Jerusalem and the Temple Mount (Rosen, 2005). The second was Ariel Sharon's poorly timed visit to the Temple Mount only a couple of months after the Camp David debacle. This was received as a provocation by the Palestinians due to this site also being the location of the Al-Aqsa Mosque, one of the most holy sites of Islam (Burgess, 2004). These events marked the beginning of the Second Intifada.

The Second Intifada was led by Fatah against the Israeli government and represented a total breakdown of the Oslo peace process which had begun seven years prior. The pervasiveness of weaponry in the West Bank and Gaza had undoubtably catalysed tensions, which gave Fatah and the other Palestinian rebel groups the capabilities to

engage in a fully-fledged armed rebellion against Israel. The increasing ease at which the Palestinians could procure weaponry during the 1990s allowed them to translate their deep dissatisfaction with the peace process into violence. Indeed, as Starazzari and Tholens (2010) conclude, the ebbs and flows of the Israeli-Palestinian crisis has a strong relationship to arms procurement dynamics. Fatah's flag is emblematic in this regard, featuring two rifles crossed over each other.

6: Conclusion

This study set out to assess the relationship between rebel strength and peace agreement failure. Through a capability based spoiling perspective it was hypothesised that greater relative rebel strength is associated post-agreement conflict risk. The results of the empirical analysis decisively support this prediction. An additional objective of this study was to disaggregate rebel strength in order to determine which mechanisms govern the relationship between rebel strength and post-agreement conflict risk. Rebel ability to procure arms was found to be significantly associated with conflict resumption. By contrast, rebel fighting proficiency and ability to mobilise popular support were found to have no association with incidence of post-agreement violent conflict. Applying the results to the cases of Uganda's NRA or Palestine's Fatah illustrate the explanatory capacity of the findings. Rebel ability to procure arms is therefore the key facet of rebel strength which determines the stability of post-agreement peace. This approach provides an alternative of understanding peace agreement failure that focuses on rebel capabilities and capacity, as opposed to the more traditional notions of credible commitment problems or ripeness (Walter, 1997; Zartman, 2000).

Although the findings of this study are insightful, it is not without limitations. The restricted observation period of 1989-2004 is a confine brought on by the temporal boundaries of Nilsson's Dyadic Dataset (2008), the data source for the dependent variable and some of the control variables. Although care must be taken when generalizing the findings to cases beyond the observation period, the decade in the immediate aftermath of the Cold War saw an incredible spike in conflict termination via negotiated settlement. This is emphasised by Toft (2006, p.10) who observes that 'peace broke out in the 1990s'. On this same point, Kreutz (2010) highlights that the

end of the Cold War was the advent of peace agreements becoming the norm for how conflicts end. Thus, the tremendous amount of peace agreements that were signed in the observation period of 1989-2004 potentially insulates the findings from substantial temporal biasing. An additional methodological limitation of this study is that the lowest possible time between peace agreement signing and conflict recurrence was one year. Rebel groups often return to the battlefield much sooner than one year after an agreement has been signed. Using post-agreement dyad month as the unit of analysis would have solved this issue, though this was unfeasible due to the limitations of Nilsson's Dyadic Dataset.

Many new exciting avenues for research are opened up by the present study. Firstly, future research should seek to replicate the findings on an expanded observation period and with a more finely grained time scale. Additionally, more work must be carried out to determine what exactly is meant by the term rebel strength. The concept could be disaggregated further, with the three dimensions proposed in this study being broken down into two or three sub-factors. Such projects being conducted quantitatively will be made possible by advancements in the data available to conflict studies researchers. To this end, the NSA dataset is a step in the right direction, though more granularity in available data is needed for a more sophisticated understanding between rebel strength and peace agreement durability.

The conclusion that rebel ability to procure armaments is associated with post-agreement conflict recurrence has significant policy implications. It lends support to disarmament initiatives as part of wider disarmament, demobilization and reintegration (DDR) programs aimed at stabilising a post-conflict environment. DDR is held to a high regard amongst practitioners as a tool for effective conflict resolution, exemplified by Kofi Anan's description of the technique as 'vital to stabilizing a post-conflict situation'

(UN Secretary-General, 2000). Indeed, Muggah (2005) explains that government strategists rely on DDR as a pragmatic technique for disarming and ultimately deterring spoilers. The findings of this study emphasise that DDR practises must account for how rebel groups procure weapons: simply collecting arms from ex-combatants who have a high capacity for armament acquisition is likely to be a vain effort. Weapons tracing as recommended by the UN's handbook for DDR practitioners (de Tessières, 2018) is one way this can be approached. Arms tracing can uncover the specific strategies that rebel groups utilise for procurement. With such information, policies for addressing specific rebel arms acquisition methods can be crafted with the overall objective of alleviating conflict recurrence risk.

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Appendix

Figure 3. *Comparison of survival curves for level of rebel strength, no power sharing provisions.*

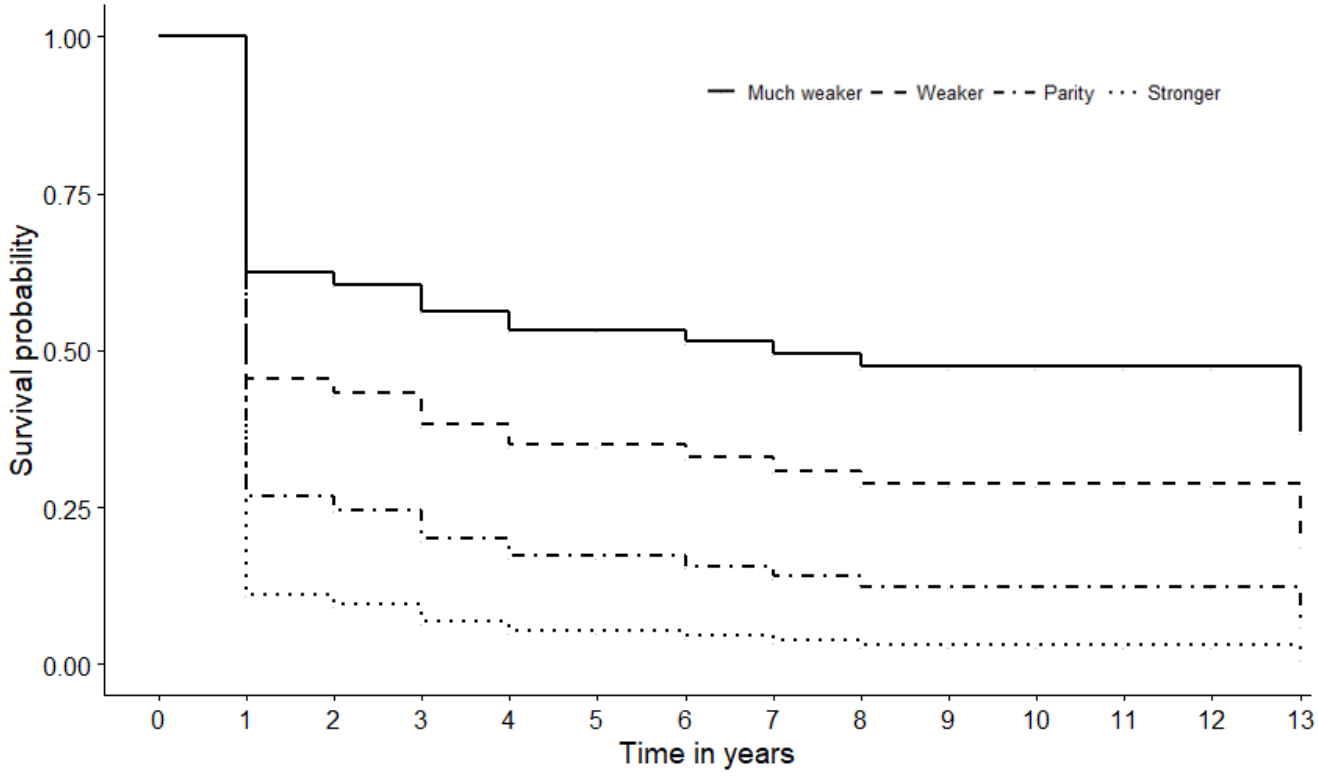
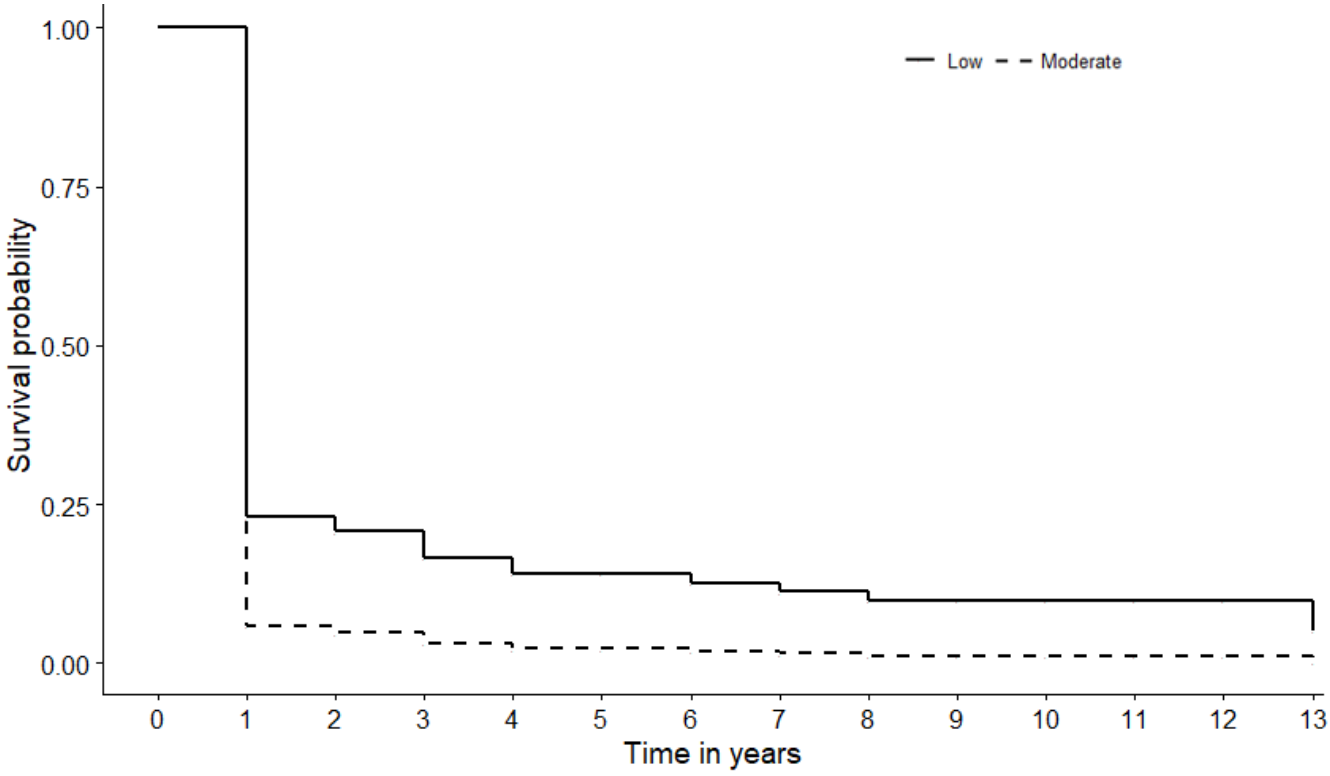


Figure 4. *Comparison of survival curves for level of arms procurement, no power sharing provisions.*



For Figures 3 and 4, binary control variables are set to their medians except for *'power sharing'*, which is set to 0. Continuous control variables are set to their means.

Figure 5. *Comparison of survival curves for level of rebel strength, governmental incompatibility.*

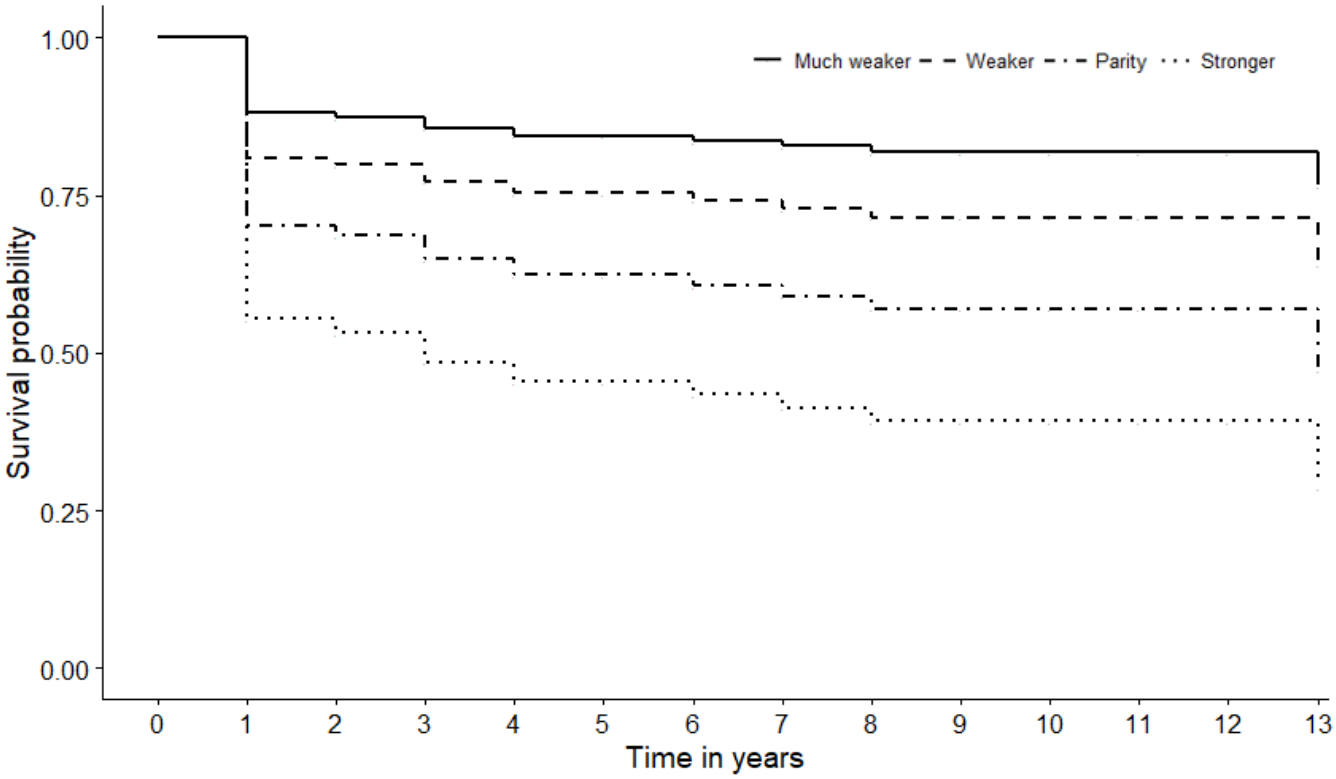
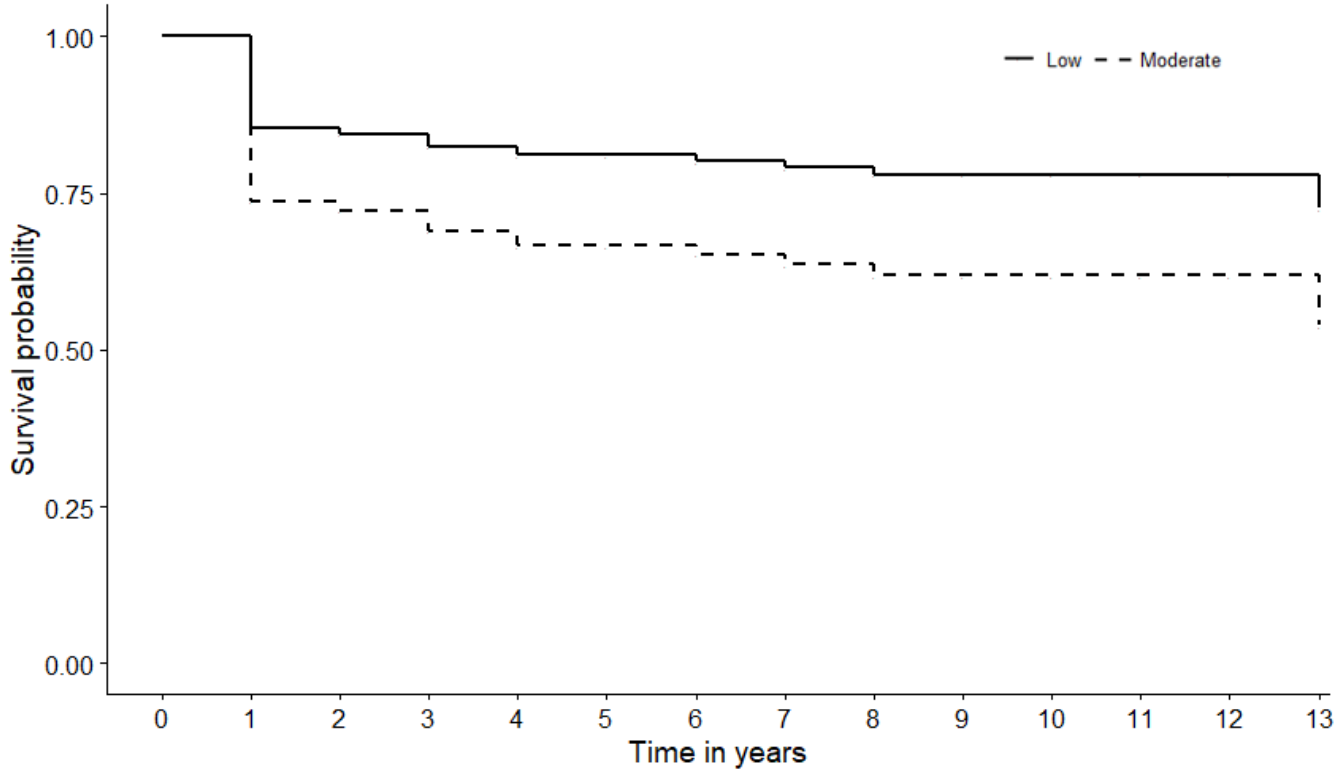


Figure 6. *Comparison of survival curves for level of arms procurement, governmental incompatibility.*



For Figures 5 and 6, binary control variables are set to their medians except for *'incompatibility'*, which is set to 0. Continuous control variables are set to their means.

Table 2. *Descriptive statistics.*

	Mean	Standard dev.	Min.	Max.
Strength	1.964	0.714	1	4
Strength: arms	0.390	0.488	0	1
Strength: mobilisation	0.461	0.499	0	1
Strength: fighting	0.498	0.501	0	1
Incompatibility	0.612	0.487	0	1
Power sharing	0.731	0.444	0	1
Excluded	0.195	0.397	0	1
Dyad duration	10.829	8.505	0	35
Dyad intensity	0.290	0.454	0	1
Number of parties	4.009	1.659	2	8
Agreement type	0.563	0.497	0	1
Dyadic peace duration	4.421	3.156	1	13