The Downstream Effects of Combatant Fragmentation on Civil War Recurrence*

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Abstract

We consider whether the fragmentation of combatants during civil war has downstream effects on the durability of peace following civil wars. We contend specifically that the splintering of groups, a primary manifestation of fragmentation, produces potential spoiler groups that are neither incidental nor unimportant in the process of civil war resolution. Making connections to the spoiling and credible commitment literatures, we hypothesize that splintering hastens the recurrence of civil wars. Empirical analysis of fragmentation events since WWII offers support for the hypothesis that splintering decreases the duration of post-civil war peace. Taken together, the results suggest the need to pay closer attention to the dynamics of fragmentation.

1 Introduction

Accounts of civil wars are replete with examples of changes to the set and characteristics of the combatants. Evidence from Chad, Sudan, Chechnya, Israel, Burundi, Peru, Angola, India, among many others, demonstrates that actors change substantially even during short periods of time. Groups often fracture, leading to new groups that are sometimes closely tied to their former group as allies; other times they break ties completely. Although group splintering occurs in a number of cases, it is less certain whether the effects of splintering are incidental or fundamental to likelihood that civil wars are resolved peacefully. Certainly, there are a number of cases, such as Afghanistan, Chad, and Liberia where groups splinter (UCDP 2010), and subsequent peace does not last (Doyle & Sambanis 2000). In this paper, we ask whether such a relationship holds more generally. Are wars that experience such fragmentation more likely to recur, and if they do recur, how quickly.

Most theoretical accounts of civil war generally consider two primary actors, a government and rebel group, or leave unspecified the set of actors involved. Other than some recent exceptions (Doyle & Sambanis 2000, Cunningham 2006, Nilsson 2008, Cunningham 2011, Cunningham, Bakke & Seymour 2012), few quantitative studies account for the role of a lengthy roster of combatants. In most qualitative accounts, the full set of actors in a civil war may be appreciated much more, but it is unclear what generalizable lessons can be learned. Greater attention to the dynamics of multiple warring factions has appeared in recent years, but this work is largely considered in the context of comparing wars with greater numbers of actors against wars with fewer (Doyle & Sambanis 2000, Cunningham 2006). Others find little evidence that general group disunity affects the durability of negotiated peace. We question whether there is something unique about the dynamics of group formation and change that needs to be considered.

In this paper, we contend that events of fragmentation, specifically the splintering of combatant groups into two or more resulting groups with the capability to continue fighting, which occur while wars are still ongoing, can alter the environment in which groups interact in

ways that change their propensities to seek peace or or spoil peace processes in the pursuit of further war. Whereas splintering could shorten the civil war, such as with Zartman's (1995, 23) "win away pieces" argument, we ask whether the duration of *post*-war peace is shortened, even if fragmentation contributed to the cessation of hostilities. We argue that splintering not only creates new groups with divergent preferences and potentially significant capabilities, but it may also lead to significant commitment problems that persist after the end of the civil war. These conditions lead to the recurrence of conflict, as new groups may be unwilling to accept the post-war situation, and governments will be wary, even of rebel groups that agree to a negotiated settlement.

Using the Uppsala Conflict Actor Database (V 2.1-2010) and Doyle & Sambanis's (2006) data on civil war recurrence, we examine whether and how rebel group splintering affects the timing of civil war recurrence. While fragmentation could refer to a generic decentralization of actors, institutions, and power (Ishiyama & Batta 2011, Bakke, Cunningham & Seymour 2012), we focus this study specifically on the effects of splits within groups, which we hereafter refer to as "fragmentation" or "fragmentation events". Our coding indicates that splintering takes place in 16% of civil wars in Doyle & Sambanis's (2006) data, but even this relatively small group of cases appears to lead to a significant shortening of post-civil war peace.

We proceed by first reviewing the literature on civil war resolution to make the point that the dynamics of actor formation and change leave many unanswered questions. Then we develop connections between fragmentation and incentives to spoil peace agreements and identify hypotheses that we then test. Of particular note, we detail the findings that fragmentation is associated with the recurrence of war. The paper contributes to our understanding of civil war resolution by drawing more attention to the dynamics of multiple stages of conflict as well as the potential for nominally weaker actors to influence the course and outcome of peace processes.

2 Literature

The civil war resolution literature has boomed in recent years with growing consensus around a number of factors associated with the successful settlement of civil wars. Generally, the literature has been guided by the rationalist approach to consider commitment and information problems (Fearon 1995, Mason & Fett 1996). More specifically, substantial attention has been placed on what makes negotiated agreements strong enough to be signed and hold over the long run (Fortna 2003, Mattes & Savun 2009). Some contend that wars ending in victory are likely much more secure than negotiated agreements (DeRouen & Sobek 2004, Quinn, Mason & Gurses 2007, Flores & Nooruddin 2009, Toft 2009). Related, the issue that has drawn perhaps the most attention is the existence and character of power-sharing arrangements (Hoddie & Hartzell 2003, Hartzell, Hoddie & Rothchild 2001, Hartzell & Hoddie 2003, Hartzell 1999, Walter 2002, Mattes & Savun 2009, Mukherjee 2006). The little work that has questioned the importance of power-sharing points to the important role of ethnicity (Downes 2004), suggesting that ethnic wars may face more severe commitment problems and are likely to see issues as indivisible (Doyle & Sambanis 2006).

Third-parties may be no less important. Some have contended that a third-party security guarantee is a near necessary condition for successful implementation of peace agreements (Hampson 1996, Walter 2002, Fortna 2004). Third-parties could also occupy a central role in a more holistic peacebuilding process (Doyle & Sambanis 2000, Doyle & Sambanis 2006) especially if implemented in a paced and measured way (Paris 2004). Contextual factors such as economic development, improvements, and incentives may be crucial to successful peace implementation (Collier, Hoeffler & Soderbom 2008, Walter 2004, Flores & Nooruddin 2009), a result that, if correct, might imply a strong role for third-parties in granting foreign aid and helping with other economic incentives.

In recent years, scholars have begun to focus more explicit attention on the behavioral dynamics of the combatants involved, including the number of combatants fighting wars or attempting to make peace, as well as the incentives that these dynamics create. Particularly,

it is becoming clear that the roster of actors cannot be ignored: some combatants may exercise a "veto" over the decision to end a war (Cunningham 2006), governments may refuse to make concessions to some groups if they are likely to face demands from many other groups afterwards (Walter 2003), and even third-party military intervention can complicate the length and terms of a war's resolution (Regan 2002, Balch-Lindsay, Enterline & Joyce 2008, Elbadawi & Sambanis 2000, Akcinaroglu & Radziszewski 2005, Cunningham 2010). Delving deeper into this relation, others have asked whether it matters *how* the various actors are involved and find that excluding actors from a peace agreement may not always matter, especially if the included parties prepare for likely violence from these additional actors (Nilsson 2008). And it may be the case that third-parties have developed ways to mediate conflicts to overcome such problems (e.g., Crocker, Hampson & Aall 1999, Crump & Glendon 2003, Crump & Zartman 2003, Raiffa 1982).

Despite substantial attention to the general conditions under which civil wars end, as well as many emerging ideas on how multi-actor wars can complicate civil war resolution, there is a lack of understanding about how fragmentation affects war dynamics. It is likely the case that the *process* of actor fragmentation whereby new actors are formed, modified, or even destroyed, affects civil wars differently than if one were to simply count up actors and consider how multi-actor wars complicate resolution. A greater understanding of how actors are formed and behave, along with all the associated complexities (Kalyvas 2003), could offer new insights into the behavioral conclusions of wars. As noted above, fragmentation could be conceptualized as an event or as a characteristic. We are suggesting that the event of splitting may in itself matter, rather than just the characteristic that a large group is fractured along several lines for a variety of reasons (Bakke, Cunningham & Seymour 2012) or alternatively the exclusive rise of new actors (Fjelde & Nilsson N.d.).

A focus on splintering challenges the unitary actor and fixed set of actors assumptions in much of the current literature (Pearlman & Cunningham 2012). It implies that how actors

form, change, and cease to exist may be important for how conflict rises and falls.[1] Some work suggests this is the case during wartime (See, for examples, Kalyvas 2006, King 2004, Humphreys & Weinstein 2006, Weinstein 2007) and has stimulated a number of questions in need of greater investigation. There is little empirical work on how splintering may affect conflict *after* civil war, however. Ishiyama & Batta (2011), for example, focus on the effects of group disunity and group cooperation during a civil war on the durability of subsequent peace agreements. This neglects the specific process of group splintering, which we argue is not only the most dramatic, but the more important, form of group disunity. This may be why their study finds mixed evidence that group disunity affects the durability of peace agreements (Ishiyama & Batta 2011, 449).

Some literature has examined fragmentation in greater depth and contends that fragmentation may actually be beneficial to ending a war, because groups are weakened and easier to defeat (Findley & Rudloff 2012), otherwise known as "divide and conquer" (Cunningham 2011). For instance, a split in the Ugandan rebel group WNBF led to the easier defeat of the WNBF and its splinter faction, the UNRF II. It may be the case that, rather than pursue victory, the government pursues a negotiation strategy that attempts to "win away pieces" (Zartman 1995, 23) or "divide and concede" (Cunningham 2011) in an attempt to reach a settlement (Nilsson 2010), encouraged by incentives not to make major concessions, especially too early in a war (Bapat 2005) or if more combatants remain (Walter 2003).[2] Such a strategy may increase the likelihood of successful settlements, as it decreases the prevalence of inherent "commitment problems" (Driscoll 2012).

While there is clearly much to be learned about whether fragmentation, in fact, motivates negotiated agreements, there is potentially an important paradox: as groups fragment, they may do so along consequential cleavages, such as moderates and extremists, where mod-

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[1]Note that our interest is in the effects, not causes, of fragmentation. The literature on the causes of fragmentation is extensive (see review in McLauchlin & Pearlman 2009), especially in the social movement literature.

[2]It may be the case that fragmentation complicates bargaining, such as in Cunningham (2007), though this approach treats fragmentation as a characteristic of the group and not as an event.

erates can press for peace more easily. Fragmentation could encourage quicker negotiated agreements (Findley & Rudloff 2012), but the process of reaching an agreement following fragmentation might sow the seeds for later breakdown.

By conventional wisdom, splits that create weak groups should not matter, because weaker groups should not have sufficient ability to veto or affect the outcome of the war (Cunningham 2006). This contrasts, however, with others who contend that even small, nominally weak groups may be able to use other strategies to create mistrust or otherwise sway the balance and derail the peace process (Werner & Yuen 2005*a*, Kydd & Walter 2002). Indeed, a literature on "spoiling" has emerged in recent years (Stedman 1997, Greenhill & Major 2007, Nilsson & Kovacs 2011) that highlights the perils of implementing the peace following civil wars, especially in the face of marginalized groups with incentives to disrupt peace. As internal political divisions affect a group's opportunity and willingness to spoil (Pearlman 2009), we now turn to a discussion of conditions under which this could occur.

3   Theory

Fragmentation creates difficulties for peace after the conclusion of fighting in a civil war. In this section, we discuss how group splintering during civil wars may lead to problems after civil wars. Such fragmentation may create new groups with different preferences, and sufficient capability to continue fighting after the conclusion of a civil war. Furthermore, the fragmentation of a rebel group during a civil war may create commitment problems in the post-civil war period, as governments and other rebel groups are uncertain of the prospects of continued adherence to the post-war status quo.

Combatants engaged in civil war are motivated by the desire to achieve a number of possible outcomes. Conventional wisdom holds that the war's outcome is paramount for both the government and rebel factions. For governments, the goal is typically thought to be a preservation of the status quo to retain power. The motivation for rebels: achieve

political change — either limited concessions, independence, or government overthrow. Wars, however, are complex and leave room for many other motivations, both political and personal (Mueller 2000, Kalyvas 2003). A combatant is not likely to have a single political goal, furthermore, but rather a variety of goals depending on the particular internal organization of the group.

During the process of war, the internal organization of a group, and its preferences about the outcome of the war, may change in response to events on the ground. As battles are won or lost and as opportunities for negotiations arise, combatants must attempt to navigate their way through the "fog" of war (Clausewitz 1993). Decisions, such as how to prosecute the war, whether to pursue peace, and on what terms face combatants regularly. And much hangs in the balance: the war could be won or lost with much at stake for the individuals who participated. Such existential threats naturally result in consequential decisions such as whether rebels should part ways and fight separately or remain together, despite different goals.

As groups splinter, the creation of new groups with divergent preferences affects how a war ends, especially whether a war ultimately recurs. The most direct way that rebel group fragmentation impedes successful civil war resolution is through the creation of factions that prefer to continue violence rather than agree to a particular settlement (Stedman 1997, Pearlman 2009). Fragmentation is likely to occur because combatants within the original rebel group disagree over the strategies or the end goals of the groups, especially in response to outside hostility (McLauchlin & Pearlman 2009). In either case, the fragmentation is indicative of an underlying divergence of preferences among rebels (Bakke, Cunningham & Seymour 2012), which can lead to differences in commitment (or opposition) to peace agreements and the acceptance of victory of one of the combatants.

While the presence of multiple rebel groups may complicate war resolution (Cunningham 2006), the mere presence of multiple rebel factions does not necessarily imply a significant divergence of preferences. Geographic limitations, such as the inability of groups with limited

capability to coordinate attacks, could account for the difficulty of securing peace. In such a case, each group may possess similar preferences, with significant overlap in their demands on the government. As groups actively pursue a split or dissolution of part of their group, however, resulting groups are likely to have significantly different sets of preferences, and it may therefore be more difficult for a settlement to satisfy all of the combatants. This is particularly true when newly splintered groups are less willing to end the violence (Stedman 1997, Pearlman 2009).

Negotiated agreements occur under a wide variety of circumstances. According to the bargaining literature, the key to reaching an agreement is that all sides know the preferences and capabilities of the other actors, allowing for a settlement to be reached that is preferred to all sides compared to the status quo (Wagner 2000, Filson & Werner 2002, Powell 2002, Powell 2004).[3] During war, combatants continue to interact with one another, allowing all parties to to gain more information about the other side (Filson & Werner 2002). Actors attempting to negotiate a peaceful end to conflict can also be strategic about what actors to include in the settlement, excluding one or more parties with the expectation that the agreement will survive in spite of violence by those parties (Nilsson 2008). Therefore, an all-inclusive settlement may obtain, but be more beneficial to some groups and not others, especially if a significant divergence of preferences characterizes the various groups. In cases where the government and rebels do not yet possess knowledge of the other side, an agreement may not reached at all, but the war stalls or ends. Such war endings are intermediate steps towards the end goal of successful peace implementation (Hampson 1996, Walter 2002).

Even in cases where the preferences for continuing the war do not diverge, or when all fragmented groups are included in a negotiated agreement (Nilsson 2008), fragmentation may create uncertainty regarding the future that may lead to renewed violence. The fragmentation of a group during a civil war may create commitment problems (e.g., Kydd & Walter 2002) that are difficult to overcome after the end of a civil war. Some argue that

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[3]In the context of intrastate conflict, capabilities are not readily apparent and may be latent until combatants engage each other in a direct and sustained way (Findley & Edwards 2007).

these issues are lessened by fragmentation, because the resulting groups that ally with the government will retain the capacity to punish the government from failing to follow through on any resulting settlement (Driscoll 2012, 121). Fragmentation is not only about the resulting capability of groups, however. Splintering may indicate a significant divergence of preferences within a group, and that further fragmentations are likely. This creates a great deal of uncertainty in the post-civil war environment, even when all sides have tentatively agreed to a settlement to end the war. This can create scenarios where settlements break down, even when all sides prefer the settlement to a recurrence of violence. A government, for example, may believe that existing rebel groups are likely to follow the terms of a peace agreement, but may also believe that these groups are not likely to exist in the future in their current form. A past fragmentation may lead to the belief the significant divisions remain with a group, and that a fragmentation may still occur that will lead to a breakdown in the agreement (Stedman 1997, Pearlman 2009).

Although fragmentation may lead to the formation of groups with diverse preferences and strategies, we focus in this paper on violent groups. Groups committed to violence are more likely to lead to significant commitment problems, even if these groups initially or eventually support a peace agreement. A peaceful group, for example, even if the preferences of the group are opposed to a particular agreement, are unlikely to cause the breakdown of the settlement due to their unwillingness to use violence. Therefore, although their preferences may be important for the peace agreement that results, such peaceful groups are unlikely to end an agreement, even if the group opposes the terms of the settlement. Violence, or more importantly, the threat of future violence is much more likely to lead groups to end a settlement, as such existential threats are more likely to create a willingness to reengage in violence rather than to fail to fully implement an agreement.

In other words, parties may engage in renewed violence not because of conditions today, but of what they perceive likely conditions to be in the future (Fearon 1995, Powell 2006). It may also be the case that fragmentation during the civil war leads to a fragile peace, as states

are unwilling to fully implement a resulting peace agreement. If a civil war ends in settlement, all included parties must commit to implementing the peace agreement (Walter 1999). This includes splintered groups that subsequently side with the government in the conflict, and how much can the government trust a rebel group to commit to peace that has so recently been an enemy? Other groups may be unwilling to fully implement an agreement when there is a belief that *any* one of the parties of the agreement will fall apart. This may create caution for implementation in other rebel groups or the government, either because this possible fragmentation may create an opportunity to obtain a greater portion of the spoils, or because groups are afraid to commit significant resources to implementing an agreement that will likely fall apart (Walter 2002). Fragmentation itself may be the most ready indicator of whether future splintering of groups is likely to undermine peace.

Furthermore, fragmentation is also likely to lead to renewed violence in cases where violence ends due to the victory of one of the sides in the conflict. We argue that fragmentation during civil wars, although it may lead to information problems (Findley & Rudloff 2012), are perhaps more problematic for post-conflict peace in terms of creating significant commitment problems (Fearon 1995, Kydd & Walter 2002, Powell 2006). The splintering of an existing group means that each of the resulting groups is likely to maintain some combative capacity. Fragmented groups are more likely than newly formed groups to be made up of members with experience in fighting the conflict, and will have knowledge of how to obtain weapons, funding, and new recruits (XXXX: CITE HERE). Fragmentation results in not only the creation of groups that are likely to possess divergent interests, but the creation of groups that are likely to possess the means to pursue those different interests. Fragmented groups are therefore better able to continue fighting and opposing the government when compared to groups that are newly created during the conflict, because they will possess important knowledge, infrastructure, and combative capacity from the formation of the group. Regardless of how the civil war ends, fragmented groups thus present a consequential obstacle to peace. If war ends with the relative victory of one of the combatants, splintered

groups may be unwilling to accept the finality of this outcome, and may bide their time until they are able to mount a new campaign against the post-war status quo. Fragmented groups may also be much smaller than the groups from which they splintered, and may only be capable of engaging in limited forms of violence. Over time, however, such a group may grow in strength and become a new focus for those opposed to the status quo to rally around. Further, even relatively small fragmented groups may be able better able to carry out disproportionately violent attacks against the victorious side, even after widespread violence has ceased.

We argue that fragmentation creates new groups that are either likely to continue fighting after the civil war, or groups that increase commitment problems among the other actors in the post-civil war period. Thus the length of peace after a civil war (despite whether the civil war ended through negotiation or fighting), is much more tenuous in cases where rebel group fragmentation occurred during the civil war. This leads to the expectation that peace is much less likely to last in cases of civil war rebel group fragmentation:

Hypothesis 1 *The duration of peace after a civil war is likely to decrease if at least one rebel group fragmented during the civil war.*

Fragmentation is an important process during civil war, but the consequences of fragmentation are felt even after the conclusion of the civil war. Fragmentation creates significant obstacles to peace, whether the obstacle is a new group willing to spoil the peace, or a severe commitment problem that make implementation of peace difficult. In either case, a fragmentation may lead to a shorter duration of peace after the civil war.

4   Research Design

We use the Doyle & Sambanis (2006) data set to analyze civil war recurrence for several reasons.[4] They include data not only on civil wars, but on the recurrence of civil wars

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[4]We obtained their replication data set from `http://pantheon.yale.edu/~ns237/index/research/DS2006replication.zip`.

(see 4.1). The data are extremely well documented, especially the beginnings and endings; something that is often ambiguous in other datasets. This additional information is necessary when determining whether a participant fragments during a civil war as opposed to before or after (see 4.2). The data contain information on civil wars from 1946–2002, a significant number of years. Finally, the death threshold is higher than the Uppsala Database, which is important given that splintering is identified if new groups contribute to having at least 25 battle-related deaths. We need to consider fragmented groups that have some non-trivial capability. But as we discuss below, the substantially higher death threshold ensures a difference in group formation and ability to bring about war recurrence.

The unit of analysis for this study is the post-civil war period, as the hypothesis refers to the duration of peace following civil war. Furthermore, we include all civil wars in the data set, regardless of whether any negotiated agreements were signed (unlike Nilsson 2008). The theoretical arguments in the previous section indicate that fragmentation may affect civil war recurrence regardless of how the civil war ended. Given this, we utilize all of the cases in the Doyle & Sambanis (2006) data as a baseline.

4.1 Dependent Variable

The hypothesis requires that we use information on the amount of time that passes prior to a civil war recurrence (Hypothesis 1). Fortunately, the Doyle & Sambanis (2006) data set contains variables fulfilling this requirement. The dependent variable used to test Hypothesis 1 is Doyle & Sambanis's (2006) duration variable on the number of months that pass prior to civil war recurring. This variable contains information not only on how much time passes prior to a civil war recurrence, but also whether a civil war recurs. This is necessary, because even though we are interested in the amount of time that passes prior to civil war recurrence, it is possible that civil wars never recur, and this information should be considered in the analysis. Unlike Ishiyama & Batta (2011), we do not restrict the data to cases of civil wars that ended in peace agreements. The hypothesis in the previous section applies to a broader

14

set of cases, including cases that ended in the victory of one of the combatants.

As a further check of the fragmentation to predict future conflict, we utilize the on Rustad & Binningsbo (2012) version of the UCDP data, which calculates "conflict episodes" (536) within a civil war as a means of testing models of peace duration. This data must be used with caution, however, as it does not measure post-civil war peace, but instead periods of time when a particular conflict does not reach the threshold of 25 deaths as a result of conflict per year (UCDP 2011). As a result, this data is likely to capture many inter-conflict lulls in violence, rather than post-civil war peace. The Doyle & Sambanis (2006) data, on the other hand, was carefully collected to capture post-civil war peace duration (Sambanis 2004, Sambanis N.d.).

We utilize event history analysis to test the duration of peace, similar to previous studies interested in explaining the amount of time that passes prior to recurrence (Hartzell & Hoddie 2003, Fortna 2003, Fortna 2004, Werner & Yuen 2005a, Mattes & Savun 2009). There is less agreement on what type of event history model to use in the civil war recurrence context, with some studies utilizing a Cox Proportional Hazards model (Hartzell, Hoddie & Rothchild 2001, Hartzell & Hoddie 2003, Fortna 2004, Werner & Yuen 2005b, Mattes & Savun 2009), and others utilizing alternatives, such as the Weibull model (Fortna 2003, Hartzell & Hoddie 2003). Here, we use the Cox Proportional Hazards model, because we do not have a strong empirical or theoretical justification to assume that civil war recurrences take place in a particular pattern (Box-Steffensmeier & Jones 2004).

4.2 Independent Variables

In order to test the hypothesis, we must construct a variable indicating whether or not a fragmentation takes place during a civil war. The Doyle & Sambanis (2006) data set does not contain a variable indicating fragmentations during the civil war. Instead, the fragmentation variable is constructed by examining other sources for evidence. First, we searched the text descriptions of the conflicts reported in UCDP (2011) to find references to

fragmentations taking place during the course of the war. Second, the actor lists in UCDP (2010) details rebel groups, and contains "a dummy variable that indicates whether a non-state actor was formed by breaking away from an actor that has also been registered in UCDP data" (UCDP 2010, codebook, p. 12). Finally, other sources are used to determine when fragmentations took place to determine whether or not a fragmentation took place within a civil war according to Doyle & Sambanis (2006) or a "conflict episodes" (Rustad & Binningsbo 2012, p. 536).

One difficulty is that much of the information on fragmentation is derived from the UCDP/PRIO Armed Conflict Dataset (Harbom & Wallensteen 2010), rather than the Doyle & Sambanis (2006) data. In some cases, the UCDP (2011) indicates that a fragmentation takes place in a year when there is no ongoing civil war in the Doyle & Sambanis (2006) data set. At this time, we are only interested in fragmentations that take place during a civil war, which means that we exclude cases when a fragmentation takes place prior to the beginning date or after the ending date of a civil war. In cases where the UCDP (2011) does not clearly indicate the year a fragmentation takes place, we consult additional sources in an attempt to determine a more specific timing.

Although there is not a perfect overlap between the UCDP/PRIO data and Doyle & Sambanis (2006), it is important that we use Doyle & Sambanis (2006) because of the higher death threshold. Using the UCDP data would be problematic because splintering is identified when new groups contribute to the production of at least 25 deaths. If the death threshold for the dependent variable were also 25 deaths, then the analysis would verge on tautology. By including the higher death threshold from Doyle & Sambanis (2006), we can be sure that splintered groups are both conceptually and operationally separate from the outcome of interest. Further, by ensuring that newly splintered rebel groups are capable of causing 25 deaths, we exclude a number of cases where rebels groups are formed that are subsequently too weak to influence conflict or even the perceptions of other actors.[5] This

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[5]One potentially problematic case is Northern Ireland. Although a group calling itself the Real IRA, does splinter prior to the peace agreement in 1998, the resulting group's activities do not lead to deaths until after

16

leads to a more conservative estimate of the frequency of fragmentation (e.g. compared to Findley & Rudloff (2012, p. 881)), but this coding of fragmentation (descriptives in Table 1) more closely follows the theoretical explanation in this paper.[6]

[**Table 1 here**]

For the analysis of the Doyle & Sambanis (2006) data, we include a number of control variables from the Doyle & Sambanis (2006) data set that correspond to theoretical arguments and empirical findings in the existing literature. First, a number of variables are included to control for characteristics of the war: whether or not the war was an ethnic conflict (Licklider 1995, Doyle & Sambanis 2006), the costliness of the war (Quinn, Mason & Gurses 2007), the number of factions involved in the war (Cunningham 2006), and whether or not the civil war ended in a military victory (Licklider 1995, Toft 2009). We include these controls to consider various characteristics of the war itself that could affect recurrence. Given third-parties have been shown to affect the duration and final outcomes of wars, another key variable included as a control is whether there was a third-party peace operation (Hartzell, Hoddie & Rothchild 2001, Hartzell & Hoddie 2003, Walter 2002, Fortna 2004, Mattes & Savun 2009). Finally, to consider the possibility that economic factors are contributing to recovery from the war (or not contributing), two economic control variables regarding the country where the civil war takes place are included: the amount of primary commodity exports (Collier & Hoeffler 2001, Doyle & Sambanis 2006) and the level of development (Quinn, Mason & Gurses 2007), as indicated by the amount of electricity used (Doyle & Sambanis 2006). Similar variables for many of these controls are also included in the Rustad & Binningsbo (2012) dataset, including a variable for United Nations peacekeeping operations, whether or not the war ended in military victory, and a variable that estimates the

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the civil war (Connolly August 19, 1998, Times 1998). We code this as a case of splintering during the civil war, since this is when the fragmentation appears to take place. Also, given that the Northern Ireland case does not recur in the data, coding this group as a civil war fragmentation provides disconfirmatory evidence for the hypothesis.

[6]For an expanded list of all case codings, see Appendix Tables 1–3.

percent of primary commodity exports as a percentage of gross domestic product, similar to Collier & Hoeffler (2001). In addition, we used the list of participants to create a list of the number of rebel groups involved in the conflict by summing the list of *named* rebel group participants (Rustad & Binningsbo 2012). Finally, a development variable that measures electricity consumption was added to the dataset using the electricity consumption information in the Correlates of War Project's National Material Capabilities Dataset (COW 2010, Singer 1988).[7]

5   Empirical Analysis

Our empirical examination of the effect of fragmentation on post-civil war peace focuses on the duration of peace following war (Hypothesis 1). Throughout our analysis, we use the Cox Proportional Hazards model, where the dependent variable is a measure of time until war recurrence. In Table 2, we report hazard ratios for each of the variables in the analysis. A hazard ratio above 1 signifies an increasing likelihood of civil war recurrences (i.e. the length of peace after the civil war decreases), whereas a hazard ratio below 1 signifies the opposite (Box-Steffensmeier & Jones 2004).[8]

[**Table 2 here**]

Table 2 presents four separate analysis, each with a different model specification to examine the robustness of the fragmentation finding. Across each of the models, the fragmentation variable is statistically significant, and the hazard ratio indicates that the presence of a fragmentation during a civil war decreases the duration of peace after the civil war. That is, civil war is more likely to recur sooner after civil wars where a splinter group has formed. These findings provide robust support for Hypothesis 1.

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[7]In the Appendix, we provide a correlation matrix with more details on how the independent variables relate to each other. See Appendix Table 4.

[8]We further test to insure the assumptions of the Cox Proportional Hazards model are not violated in our primary model (Model 1). Both the "link test" and the "Schoenfeld residuals" test indicate the assumptions are not violated (Cleves, Gutierrez, Gould & Marchenko 2010).

The findings are consistent across each of the model specifications. After employing a baseline model specification in Model 1, we then turn to Model 2, which excludes the variable indicating the number of groups active in the civil war in order to separate the effect of the process by which rebel groups may be created (i.e. fragmentation) from the results of this process (the number of groups active). The fragmentation variable is statistically significant across both models, indicating that the process by which new groups are formed is distinctly important important relative to the overall number of groups in explaining civil war recurrence.

Model 3 uses a different variable indicate the presence of a peacekeeping mission, focusing on United Nations peacekeeping rather than peacekeeping from a variety of sources.[9] Again, the effect of the fragmentation variable is consistent with previous models, although when examining the presence of United Nations peacekeeping, the hazard ratio of the fragmentation variable decreases slightly. Regardless of the source of the peacekeeping operation, however, there appears to be little evidence from the models that peacekeeping increases the length of peace after the termination of a civil war. This runs counter to the finding in much of the literature that such operations increase peace in the post-civil war period (Hartzell, Hoddie & Rothchild 2001, Walter 2002, Hartzell & Hoddie 2003, Fortna 2004, Mattes & Savun 2009).

The final model (Model 4) in Table 2 includes a number of other variables from the Doyle & Sambanis (2006) data that may also influence the length of peace after civil war. Only one of the additional variable in Model 4, the population of the state experiencing civil war, appears to be related to the length of peace. According to the model, as the population gets larger, the duration of peace decreases. Fragmentation remains a statistically significant indicator of a decrease in peace duration. There are, however, other consistent findings across the four models. First, the primary commodity exports variable is statistically significant, and indicates that as these exports increase, the duration of peace decreases. This supports

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[9]Both of these peacekeeping variables are from Doyle & Sambanis's (2006) data, insuring measurement consistency across the two variables.

existing findings in the literature (Collier & Hoeffler 2001, Doyle & Sambanis 2006). Second, the development variable indicates that the greater the development of a state, the longer the duration of peace after a civil war, as indicated in previous studies (Quinn, Mason & Gurses 2007).[10]

Perhaps most interesting across these models is that despite findings in the literature that civil wars that end in military victory are associated with longer periods of post-conflict peace (Rustad & Binningsbo 2012), there is no evidence here that this is the case. If there is a link between fragmentation and rebel group defeat (CITE HERE), for example, then the associated between fragmentation and peace is spurious. Further, it would mean that our theoretical arguments regarding commitment problems above and similar arguments (CITE HERE) are incorrect - fragmentation is a result of rebel groups splintering as a result of military losses (Findley & Rudloff 2012) or government strategies meant to weaken rebel opposition (CITE HERE). Crosstabulations and χ^2 tests of fragmentation and various civil war endings (reported in Appendix Tables 7–10) demonstrate that military victory is an important factor, but that rebel fragmentation is much less likely to occur in conflicts that end in military victory. This could be due to our reliance on the UCDP data for indications of fragmentation, and that splintering among small groups unable to meet the threshold for violence (Gleditsch, Wallensteen, Eriksson, Sollenberg & Strand 2002) are more likely to occur in cases of rebel defeat (CITE HERE). On the other hand, we believe that this measurement is much more consistent with the theory of commitment problems, where the fragmentation of larger groups are more likely to lead to civil war recurrence. Indeed, while crosstabulations indicate that fragmentation is more likely to occur in cases of peace treaties, there is no statistically significant association between fragmentation during civil wars and the implementation of treaties after civil wars in the Doyle & Sambanis (2006) data. This is consistent with the argument that fragmentation can lead prevent parties from effectively

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[10]We estimated a series of additional models that provide alternative specifications of the Cox Proportional Hazards model and report on them in the Appendix (Tables 5 & 6). The results are consistently substantial and significant across all of these models.

committing to peace.

The statistical evidence thus offers strong support for Hypothesis 1, illustrating the negative effects that the fragmentation of groups can have on the prospects for durable peaceful resolution to civil wars. As a further illustration of the effect of fragmentation on the duration of peace, Figure 1 presents the rate at which civil wars recur over time, comparing cases where a splinter group was created during the civil war (the dashed line) with cases where no fragmentation took place. The figure indicates that a number of cases of civil war appear to recur immediately, however, a civil war is much more likely to recur in the first month after civil war if a fragmentation occurred during the civil war (i.e. approximately 0.9 survival rate for non-fragmentation compared with approximately 0.8 survival rate for fragmentation cases). Further, the rate at which civil wars recur is much greater over time when fragmentation takes place during the conflict. Both Table 2 and Figure 1 thus provide support for Hypothesis 1.

[**Figure 1 here**]

The UCDP data derived from (Rustad & Binningsbo 2012) also provides support for the role of fragmentation during conflict as decreasing periods of peace. Table 3 summarizes the findings of this analysis. In four of the five models presented, the fragmentation variable decreases the duration of periods without violence and is statistically significant. The exception to this is Model 5 where the fragmentation variable is no longer statistically significant. Note, however, that the final two models include over a 100 fewer cases than the other models, for a 40% decrease in the sample size.

[**Table 3 here**]

The significance of the fragmentation variable, indeed, is one of the most consistent findings across the analysis of the Doyle & Sambanis (2006) and Rustad & Binningsbo (2012) data. For example, although the development variable is statistically significant

across all of the models in Table 2, in Table 3 the development variables appear to be statistically significant only in the models that include the larger sample sizes. Meanwhile, variables that appeared to have little effect on peace duration in the Doyle & Sambanis (2006) data appear to play an important role in Rustad & Binningsbo (2012) data. Most strikingly, the military outcome variable is statistically significant across all of the model, and indicates that a military outcome will greatly increase the length of time without violence (see (Licklider 1995, Toft 2009)). United Nations peacekeeping missions also seem to play a more prominent role, at least in the models that include the larger number of cases in Table 3, which is more consistent with the findings of studies, such as Fortna (2004) that find peacekeeping plays an important role in decreasing the recurrence of civil war. The number of factions, which may serve as a proxy for the number of important rebel groups that must be convinced to end fighting in order to reach a peaceful settlement in civil wars (Cunningham 2006) appears to be statistically significant in the more restricted set of cases in Model 5 in Table 3.

5.1   Propensity Score Matching

The above models demonstrate a clear association between fragmentation during civil war conflict and shortened post-conflict peace. It is possible, however, that the link we observe between fragmentation and post-conflict peace is spurious or that endogeneity is preventing a clear assessment of relationship. Given the non-random sample of civil war cases and the confounding possibility that fragementation is related to civil war outcomes (see above), further analysis that attempts to isolate the effects of fragmentation from other factors is necessary. Isolating a causal impact is particularly challenging because fragmentation is not randomly assigned. We are thus left with the need to consider possible quasi-experimental identification strategies. Table 4 presents a propensity score matching analysis (Dehejia & Wahba 2002), based on Model One from Table 2. Propensity score matching helps isolate the role of fragmentation by creating conditions similar to an experiment - each civil war

case with fragmentation is "matched" with a similar civil war case where fragmentation did not take place (see Dehejia & Wahba (2002) for a more detailed discussion of propensity score matching).[11] In this way, the role of fragmentation can be analyzed among cases where all of the other control variables are held relatively constant. In Table 4 each of the 21 cases of fragmentation were matched with one other similar case.

[**Table 4 here**]

As is clear in Table 4, fragmentation still appears to be linked with shorter post-conflict peace. Model 1 presents a Cox proportional hazards model with only fragmentation, while Model 2 presents the full model from Table 2 above. In both cases, fragmentation is statistically significant and is associated with shorter length of peace after a civil war. As this smaller sample of cases is able to better isolate the role of fragmentation by approximating an experimental design, there is less opportunity for other important variables that might be associated with both fragmentation and shorter peace to confound the results.

6   Conclusion

Splintering occurs in a number of civil wars (see Table 1), and our analysis indicates that the presence of these fragmentations may significantly alter the peace after a civil war. The quantitative analysis here suggests that cases such as Liberia and Chad, where fragmentation occurs and peace is fleeting (UCDP 2010, Doyle & Sambanis 2006) are not outliers, but rather part of a general pattern. Although studies examine the possible effects of the number of combatants on civil wars (Cunningham 2006, Doyle & Sambanis 2006), we argue that the process by which groups emerge during civil war is an important indicator of whether civil wars are likely to recur. Specifically, we argue that when groups are created through fragmentation, the resulting groups are likely to cause significant difficulties for maintaining peace in the future.

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[11]The PSMATCH2 Stata package (Leuven & Sianesi N.d.) was used to conduct the propensity score matching analysis.

The findings here are particularly worrying given the potential incentives for a government to induce fragmentation in an effort to successfully end the civil war (Cunningham 2011, Driscoll 2012). It suggests that the strategies used by governments to help end civil conflict may be counterproductive for long term peace. Although space does not allow, further research is necessary to indicate whether supporting the splintering of rebel groups to arrive at peace is only an indicator of future violence, or a potential *cause* of that violence.

There are several possible theoretical explanations for the increased likelihood of civil war recurrence resulting from fragmentation. First, fragmentation may be tied to spoiling (Stedman 1997, Pearlman 2009), where the fragmentation of a group indicates that the newly created group is likely to possess significantly different preferences from the original group, as well as the capability necessary to further these goals. Second, adding to the growing number of ways that commitment problems may be associated with civil war (Walter 1999, Kydd & Walter 2002, Mattes & Savun 2009), fragmentation may make it difficult for other groups to commit to peace with a fragmented group. In either case, the specific process of fragmentation leads to a decrease in the time until recurrence of the civil war. Although there is support for the hypothesis that fragmentation decreases the duration of peace after a civil war, much remains to be done including addressing the mechanisms linking fragmentation to recurrence.

The empirical evidence does strongly support the growing suspicions of an increasing amount of scholarship on the deleterious effects of fragmentation during and after civil wars. Few empirical studies exist linking fragmentation to civil war dynamics and outcomes, however. We expect that this study will contribute to the burgeoning empirical literature on heterogeneity and fragmentation during war, and provide a basis for continued work in this research area moving forward. Although this is an important initial finding, many important questions remain to be answered. For example, although fragmentation is likely to lead to renewed civil war violence, the specific path to the breakdown of peace will lead to significant insights into how recurrence occurs. Such studies are only possible as new data

becomes available that disaggregates the actions of rebel groups (Raleigh, Linke, Hegre &
Karlsen 2010, Sundberg & Melander 2013).

References

Akcinaroglu, Seden & Elizabeth Radziszewski. 2005. "Expectations, Rivalries, and Civil War Duration." *International Interactions* 31(4):349–374.

Bakke, Kristin M., Kathleen Gallagher Cunningham & Lee J. M. Seymour. 2012. "A Plague of Initials: Fragmentation, Cohesion, and Infighting in Civil Wars." *Perspectives on Politics* 10(2):265–283.

Balch-Lindsay, D., A.J. Enterline & K.A. Joyce. 2008. "Third-party intervention and the civil war process." *Journal of Peace Research* 45(3):345.

Bapat, Navin. 2005. "Insurgency and the Opening of Peace Processes." *Journal Of Peace Research* 42(6):699–717.

Box-Steffensmeier, Janet M. & Bradford Jones. 2004. *Event History Modeling: A Guide for Social Scientists.* Cambridge, UK: Cambridge.

Clausewitz, Carl von, ed. 1993. *On War.* London: David Campbell.

Cleves, Mario, Roberto G. Gutierrez, William Gould & Yulia V. Marchenko. 2010. *An Introduction to Survival Analysis Using Stata.* Third ed. College Station, TX: Stata Press.

Collier, Paul & Anke Hoeffler. 2001. "Greed and Grievance in Civil War." *World Bank Working Paper* .

Collier, Paul, Anke Hoeffler & Mans Soderbom. 2008. "Post-Conflict Risks." *Journal of Peace Research* 45(4):461–478.

Connolly, Shaun. August 19, 1998. "Omagh's Bombers in Truce; Real IRA Halt Further Attacks." *Birmingham Evening Mail* p. 1.

COW. 2010. "National Material Capabilities Dataset, version 4.0.".

Crocker, C.A., F.O. Hampson & P.R. Aall. 1999. *Herding cats: Multiparty mediation in a complex world.* United States Inst of Peace Pr.

Crump, L. & A.I. Glendon. 2003. "Towards a paradigm of multiparty negotiation." *International Negotiation* 8(2):197–234.

Crump, L. & I.W. Zartman. 2003. "Multilateral negotiation and the management of complexity." *International Negotiation* 8(1):1–5.

Cunningham, David. 2006. "Veto Players and Civil War Duration." *American Journal of Political Science* 50(4):875–892.

Cunningham, David. 2010. "Blocking Resolution: How External States Can Prolong Civil War." *Journal of Peace Research* 47(2):115–127.

Cunningham, Kathleen Gallagher. 2007. Divided and Conquered: Why States and Self-Determination Groups Fail in Bargaining Over Autonomy PhD thesis University of California, San Diego.

Cunningham, Kathleen Gallagher. 2011. "Divide and Conquer or Divide and Concede: How Do States Respond to Internally Divided Separatists?" *American Political Science Review* 105(2):275–297.

Cunningham, Kathleen Gallagher, Kristin M. Bakke & Lee J. M. Seymour. 2012. "Shirts Today, Skins Tomorrow: Dual Contests and the Effects of Fragmentation in Self-Determination Disputes." *Journal of Conflict Resolution* 56(1):67–93.

Dehejia, Rajeev H. & Sadek Wahba. 2002. "Propensity Score-Matching Methods for Non-experimental Causal Studies." *The Reivew of Economics and Statistics* 84(1):151–161.

DeRouen, Karl & David Sobek. 2004. "The Dynamics of Civil War Duration and Outcome." *Journal of Peace Research* 41(3):303–320.

Downes, Alexander. 2004. "The Problem with Negotiated Settlements to Ethnic Civil Wars." *Security Studies* 13(4):230–279.

Doyle, Michael & Nicholas Sambanis. 2000. "International Peacebuilding: A Theoretical and Quantitative Analysis." *American Political Science Review* 94(4):779–801.

Doyle, Michael & Nicholas Sambanis. 2006. *Making War and Building Peace: United Nations Peace Operations.* Princeton, NJ: Princeton University Press.

Driscoll, Jesse. 2012. "Commitment Problems or Bidding Wars? Rebel Fragmentation as Peace Building." *Journal of Conflict Resolution* 56(1):118–149.

Elbadawi, Ibrahim & Nicholas Sambanis. 2000. External Interventions and the Duration of Civil War. Technical Report 2433. World Bank, DECRG.

Fearon, James D. 1995. "Rationalist Explanations for War." *International Organization* 49(3):379–414.

Filson, Darren & Suzanne Werner. 2002. "A Bargaining Model of War and Peace: Anticipating the Onset, Duration, and Outcome of War." *American Journal of Political Science* 46(4):819–837.

Findley, Michael & Peter Rudloff. 2012. "Combatant Fragmentation and the Dynamics of Civil Wars." *British Journal of Political Science* 42(4):879–901.

Findley, Michael & Scott Edwards. 2007. "Accounting for the Unaccounted: Weak-Actor Social Structure in Asymmetric Wars." *International Studies Quarterly* 51(3):583–606.

Fjelde, Hanne & Desiree Nilsson. N.d. "XXXX: ADD TITLE HERE." Unpublished Manuscript: Uppsala University.

Flores, T.E. & I. Nooruddin. 2009. "Democracy Under the Gun: Understanding Post-Conflict Recovery." *Journal of Conflict Resolution* 53(1):3–29.

Fortna, Virginia Page. 2003. "Scraps of Paper? Agreements and the Durability of Peace." *International Organization* 57(2):337–372.

Fortna, Virginia Page. 2004. "Does Peacekeeping Keep Peace? International Intervention and the Duration of Peace after Civil War." *International Studies Quarterly* 48(2):269–292.

Gleditsch, Nils Petter, Peter Wallensteen, Mikael Eriksson, Margareta Sollenberg & Havard Strand. 2002. "Armed Conflict 1946 - 2001: A New Dataset." *Journal of Peace Research* 39(5):615–637.

Greenhill, Kelly & Solomon Major. 2007. "The Perils of Profiling: Civil War Spoilers and the Collapse of Intrastate Peace Accords." *International Security* 31(3):7–40.

Hampson, Fen Osler. 1996. *Nurturing Peace: Why Peace Settlements Succeed or Fail.* Washington, D.C.: U.S. Institute of Peace Press.

Harbom, L. & P. Wallensteen. 2010. "XXXX: ADD TITLE HERE." *Journal of Peace Research* 47(4):501.

Hartzell, Caroline. 1999. "Explaining the Stability of Negotiated Settlements to Intrastate Wars." *Journal of Conflict Resolution* 43(1):3–22.

Hartzell, Caroline & Matthew Hoddie. 2003. "Institutionalizing Peace: Power Sharing and Post-Civil War Conflict Management." *American Journal of Political Science* 47(2):318–332.

Hartzell, Caroline, Matthew Hoddie & Donald Rothchild. 2001. "Stabilizing the Peace after Civil War: An Investigation of Some Key Variables." *International Organization* 55(1):183–208.

Hoddie, Matthew & Caroline Hartzell. 2003. "Civil War Settlements and the Implementation of Military Power-Sharing Arrangements." *Journal of Peace Research* 40(3):303–320.

Humphreys, Macartan & Jeremy Weinstein. 2006. "Handling and Manhandling in Civil War." *American Political Science Review* 100(3):429–447.

Ishiyama, John & Anna Batta. 2011. "Rebel Organizations and Conflict Management in Post-Conflict Societies 1990–2009." *Civil Wars* 13(4):437–457.

Kalyvas, Stathis. 2003. "The Ontology of 'Political Violence': Action and Identity in Civil Wars." *Perspectives on Politics* 1:475–494.

Kalyvas, Stathis. 2006. *The Logic of Violence in Civil War.* Cambridge: Cambridge University Press.

King, C. 2004. "The micropolitics of social violence." *World Politics* 56(3):431–455.

Kydd, Andrew & Barbara Walter. 2002. "Sabotaging the Peace: The Politics of Extremist Violence." *International Organization* 56:263–296.

Leuven, Edwin & Barbara Sianesi. N.d. "PSMATCH2: Stata Moduled to Perform Full Mahalanobis and Propensity Score Matching, Common Support Graphing, and Covariate Imbalance Testing.".

Licklider, Roy. 1995. "The Consequences of Negotiated Settlements in Civil Wars, 1945–1993." *American Political Science Review* 89(3):681–690.

Mason, T. David & Patrick Fett. 1996. "How Civil Wars End — a Rational Choice Approach." *Journal of Conflict Resolution* 40(4):546–568.

Mattes, M. & B. Savun. 2009. "Fostering peace after civil war: commitment problems and agreement design." *International studies quarterly* 53(3):737–759.

McLauchlin, Theodore & Wendy Pearlman. 2009. Out-group Conflict, In-group Unity? Exploring the Effect of Repression on Movement Fragmentation. In *Presented at the Annual Meeting of the American Political Science Association, Toronto, Sept 3–6, 2009.*

Mueller, J. 2000. "The Banality of' Ethnic War"." *International Security* 25(1):42–70.

Mukherjee, Bumba. 2006. "Why Political Power-Sharing Agreements Lead to Enduring Peaceful Resolution of Some Civil Wars, But Not Others?" *International Studies Quarterly* 50(2):479–504.

Nilsson, D. 2010. "Turning Weakness into Strength." *Conflict Management and Peace Science* 27(3):253.

Nilsson, Desiree. 2008. "Partial Peace: Rebel Groups Inside and Outside of Civil War Settlements." *Journal of Peace Research* 45(4):479–495.

Nilsson, Desiree & Mimmi Soderberg Kovacs. 2011. "Revisiting an Elusive Concept: A Review of the Debate on Spoilers in Peace Processes." *International Studies Review* 13(4).

Paris, Roland. 2004. *At war's end: building peace after civil conflict.* Cambridge Univ Pr.

Pearlman, W. 2009. "Spoiling Inside and Out: Internal Political Contestation and the Middle East Peace Process." *International Security* 33(3):79–109.

Pearlman, Wendy & Kathleen Gallagher Cunningham. 2012. "Nonstate Actors, Fragmentation, and Conflict Processes." *Journal of Conflict Resolution* 56(1):3–15.

Powell, Robert. 2002. "Bargaining Theory and International Conflict." *Annual Review of Political Science* 5:1–30.

Powell, Robert. 2004. "Bargaining and Learning While Fighting." *American Journal of Political Science* 48(2):344–361.

Powell, Robert. 2006. "War as a Commitment Problem." *International Organization* 60(1):169–203.

Quinn, J.M., T.D. Mason & M. Gurses. 2007. "Sustaining the peace: Determinants of civil war recurrence." *International Interactions* 33(2):167–193.

Raiffa, Howard. 1982. *The Art and Science of Negotiation.* Cambridge, MA: Harvard University Press.

Raleigh, Clionadh, Andrew Linke, Havard Hegre & Joakim Karlsen. 2010. "Introducing ACLED: An Armed Conflict Location and Event Dataset." *Journal of Peace Research* 47(5):651–660.

Regan, Patrick M. 2002. "Third-Party Interventions and the Duration of Intrastate Conflicts." *Journal of Conflict Resolution* 46(1):55–73.

Rustad, Siri Aas & Helga Malmin Binningsbo. 2012. "A Price Worth Fighting For? Natural Resourcecs and Conflict Recurrence." *Journal of Peace Research* 49(4):531–546.

Sambanis, Nicholas. 2004. "What is Civil War? Conceptual and Empirical Complexities of an Operational Definition." *Journal of Conflict Resolution* 48(6):814–858.

Sambanis, Nicholas. N.d. "Civil War Coding Notes.".

Singer, J. David. 1988. "Reconstructing the Correlates of War Dataset on Material Capabilities of States, 1816-1985." *International Interactions* 14(2):115–132.

Stedman, Stephen. 1997. "Spoiler Problems in Peace Processes." *International Security* 22(2):5–53.

Sundberg, Ralph & Erik Melander. 2013. "Introducing the UCDP Georeferenced Event Dataset." *Journal of Peace Research* 50(4):523–532.

Times, Irish. 1998. "Three Republican Groups Now Active." *The Irish Times* p. 9.

Toft, M.D. 2009. *Securing the peace: the durable settlement of civil wars.* Princeton Univ Pr.

UCDP. 2010. "Uppsala Conflict Data Program. UCDP Actor Database, version 2.1-2010." Uppsala University. http://www.ucdp.uu.se. Retrieved January–February 2011.

UCDP. 2011. "Uppsala Conflict Data Program. UCDP Conflict Database." Uppsala University. http://www.ucdp/uu.se/database. Retrieved 2010–2011.

Wagner, R. Harrison. 2000. "Bargaining and War." *American Journal of Political Science* 44(3):469–484.

Walter, Barbara. 1999. "Designing Transitions from Civil War - Demobilization, Democratization, and Commitments to Peace." *International Security* 24(1):127–155.

Walter, Barbara. 2003. "Explaining the Intractability of Territorial Conflict." *International Studies Review* 5(4).

Walter, Barbara. 2004. "Does Conflict Beget Conflict? Explaining Recurring Civil War." *Journal of Peace Research* 41(3):371–388.

Walter, Barbara F. 2002. *Committing to Peace: The Successful Settlement of Civil Wars.* Princeton: Princeton University Press.

Weinstein, J.M. 2007. *Inside rebellion: The politics of insurgent violence.* Cambridge Univ Pr.

Werner, Suzanne & Amy Yuen. 2005*a*. Enforcing Peace: Suppressing Extremists without Losing the Moderates. In *New Directions for International Relations: Confronting the Method-of-Analysis Problem*, ed. Alex Mintz & Bruce Russett. Lanham, MD: Lexington Books. pp. 199–222.

Werner, Suzanne & Amy Yuen. 2005*b*. "Making and Keeping Peace." *International Organization* 59(2):261–292.

Zartman, I. William. 1995. *Elusive Peace: Negotiating an End to Civil Wars.* Washington, D.C.: Brookings Institution.

	Number of Cases	% Cases
Fragmentation	22	16%
No Fragmentation	116	84%
Totals	138	100%

Table 1: Frequency of Fragmentation
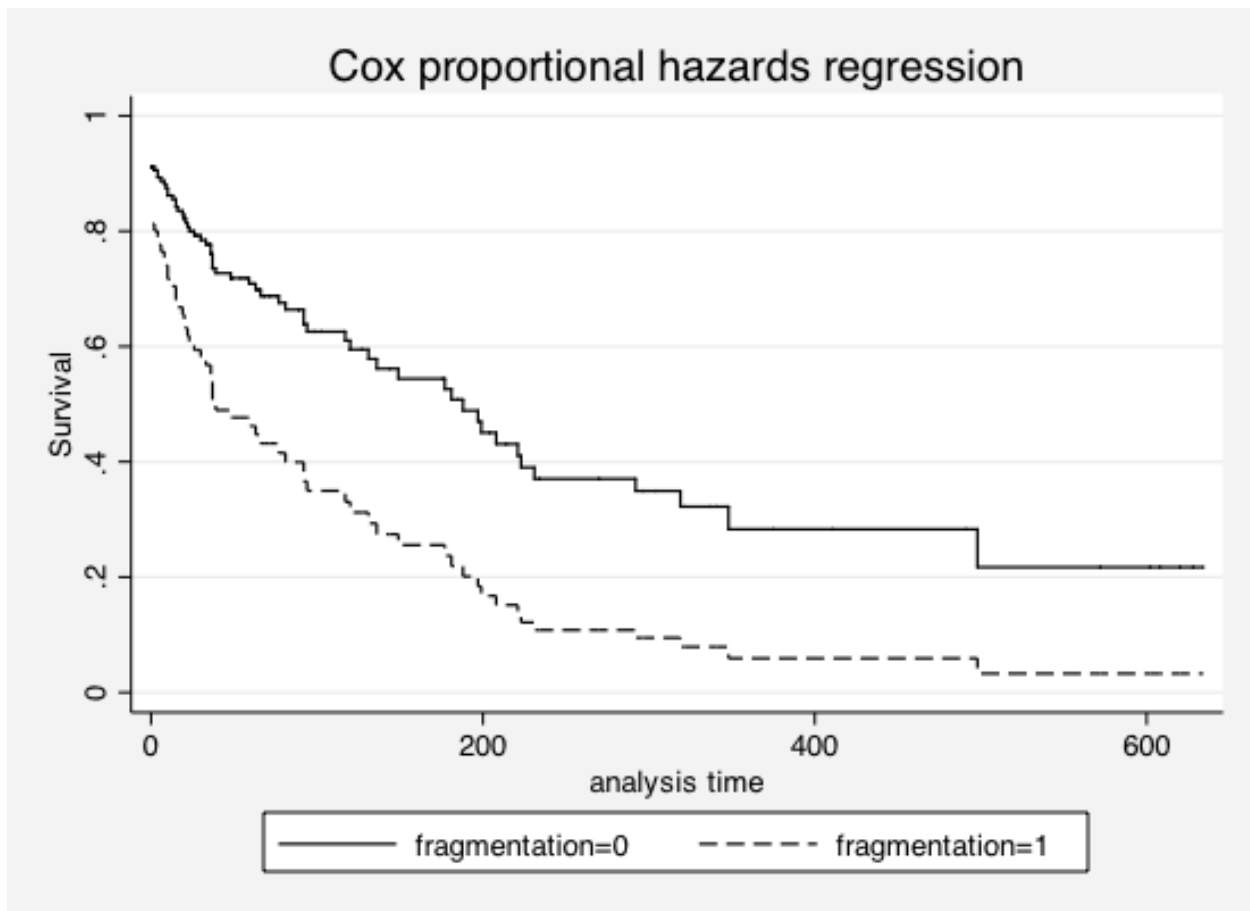
Figure 1: Comparison of Survival Rates Over Time (Fragmentation vs. No Fragmentation)

	Model 1	Model 2	Model 3	Model 4
Fragmentation	**2.240****	**2.254****	**2.053****	**2.247****
	(0.718)	**(0.712)**	**(0.671)**	**(0.732)**
Ethnic Civil War	1.528	1.523	1.504	1.316
	(0.440)	(0.436)	(0.435)	(0.400)
Costs of Civil War	1.095	1.097	1.093	1.077
	(0.069)	(0.069)	(0.066)	(0.071)
Number of Factions	1.014	-	1.027	1.080
	(0.079)	-	(0.079)	(0.085)
Strong Peace Operations (All)	0.765	0.772	-	0.801
	(0.320)	(0.323)	-	(0.374)
Strong Peace Operations (UN)	-	-	0.371	-
	-	-	(0.287)	-
Military Outcome	0.816	0.810	0.770	0.756
	(0.221)	(0.217)	(0.207)	(0.226)
Level of Development/Electricity	0.999**	0.999**	0.999**	0.999**
	(0.0003)	(0.0003)	(0.0003)	(0.0002)
Commodity Exports/GDP	2.930***	2.875***	2.729***	3.193**
	(1.115)	(1.070)	(1.041)	(1.582)
Length of Civil War	-	-	-	0.998
	-	-	-	(0.002)
Log of Population	-	-	-	1.138*
	-	-	-	(0.083)
Terrain (Mountains)	-	-	-	0.999
	-	-	-	(0.006)
Decade Civil War Began	-	-	-	1.086
	-	-	-	(0.121)
n	131	131	131	131
Log-likelihood	-277.343	-277.354	-276.403	-275.384
χ^2	< 0.001	< 0.001	< 0.001	< 0.001

Table reports hazard ratios, with robust standard errors in parentheses.

p-values: $^* < 0.1$, $^{**} < 0.05$, $^{***} < 0.01$

Table 2: Cox Proportional Hazards Model: Doyle & Sambanis data

	Model 1	Model 2	Model 3	Model 4	Model 5
Fragmentation	**2.517*****	**1.997****	**1.707***	**1.774***	**1.196**
	(0.700)	**(0.563)**	**(0.0529)**	**(0.557)**	**(0.454)**
Number of Factions	-	-	1.147	-	1.311**
	-	-	(0.117)	-	(0.150)
UN Peacekeeping	-	0.558*	0.508**	0.687	0.636
	-	(0.180)	(0.170)	(0.236)	(0.220)
Military Outcome	-	0.436***	0.429***	0.369***	0.350***
	-	(0.091)	(0.089)	(0.088)	(0.0839)
COW Electricity	-	1.000**	1.000**	1.000	1.000
	-	(0.0000004)	(0.0000004)	(0.0000005)	(0.0000005)
Commodity Exports/GDP	-	-	-	1.634	1.808
	-	-	-	(2.524)	(2.780)
n	251	250	250	149	149
Log-likelihood	-571.570	-560.953	-560.116	-381.766	-379.270
χ^2	0.003	< 0.001	< 0.001	< 0.001	< 0.001

Table reports hazard ratios, with robust standard errors in parentheses.
p-values: * < 0.1, ** < 0.05, *** < 0.01

Table 3: Cox Proportional Hazards Models: UCDP Data

	Model 1	Model 2
Fragmentation	**2.967****	**3.635*****
	(1.265)	**(1.637)**
Ethnic Civil War	-	4.796**
	-	(3.660)
Costs of Civil War	-	1.147
	-	(0.214)
Number of Factions	-	1.007
	-	(0.115)
Strong Peace Operations (All)	-	1.324
	-	(0.871)
Military Outcome	-	0.603
	-	(0.324)
Level of Development/Electricity	-	0.999*
	-	(0.0004)
Commodity Exports/GDP	-	3.579
	-	(2.154)
n	42	42
Log-likelihood	-74.958	-67.776
χ^2	0.011	< 0.001

Table reports hazard ratios, with robust standard errors in parentheses.

p-values: $^* < 0.1$, $^{**} < 0.05$, $^{***} < 0.01$

Table 4: 1 to 1 Propensity Score Matching Analysis - Doyle and Sambanis (2006)