ABSTRACT

Title of Dissertation: THE STRATEGY OF CIVIL CONFLICT: THE DETERMINANTS OF CONFLICT INTENSITY AND EFFECT OF INTENSITY ON DURATION

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Conflict onset and duration have been studied extensively, however the dynamics of what happens within a conflict have received much less attention. At the center of the issue of conflict dynamics is conflict intensity. Some civil conflicts resemble interstate wars with armies using conventional tactics which kill thousands of people per year, while many others consist of small guerrilla conflicts that kill only dozens. The capabilities of the rebel groups in these conflicts determine the tactics they will adopt, which in turn determines how intensely the conflict will be fought. Foreign intervention into civil conflicts influences the tactical decisions of actors, further increasing conflict intensity. To add to the disastrous effects of high-intensity conflicts, when intensity increases, conflicts also last longer, increasing the period over which the damage from these conflicts is inflicted.

THE STRATEGY OF CIVIL CONFLICT: THE DETERMINANTS OF CONFLICT INTENSITY AND EFFECT OF INTENSITY ON DURATION

by

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Chapter 1

Introduction

Almost a million people have been killed in combat in civil conflicts over the last 30 years[1]. Despite the fact that over 300 rebel groups have been involved in these conflicts, most of the deaths have come from just 11 of them. Most civil conflicts are relatively small, with half causing less than 120 deaths per year, while a small number of conflicts kill vast numbers of people, with the top ten percent of conflicts killing over 3000 people per year. Why do we see this vast disparity in the magnitude of fighting in different conflicts?

Many of the conflicts that people think of when discussing civil wars are actually much smaller than commonly believed. The Irish Republican Army's struggle against the government of the United Kingdom only resulted in 36 deaths per year between 1989 and the end of the conflict in 1998. ETA (Euskadi ta azkatasuna, or Basque Nation and Liberty), another well-known Euro-

[1]This figure is based on battle death data from the Uppsala Conflict Data Program, covering the years 1989-2016.

pean rebel group, only produced a total of 211 battle deaths in their rebellion against Spain over 18 active years between 1989 and 2011, averaging just 12 deaths per year.

Israel is often considered a country mired in civil conflict, however despite being involved in eight different civil conflict dyads over the last 20 years, the most deadly of those conflicts, with Hamas, has only averaged 286 deaths per year, making it less deadly that 84 other contemporaneous conflicts. Fighting with Fatah, the largest of the Palestinian rebel groups, has averaged only 40 deaths per year, and even Hezbollah and Israel, often seen as a major conflict, have only averaged 139 deaths per year.

In contrast to the many small conflicts that occur throughout the world, large civil wars also occur, although less frequently. In Ethiopia, major conflicts with both the Eritrean People's Liberation Front (EPLF) and the Ethiopian People's Revolutionary Democratic Front (EPRDF) both resulted in about 14,000 deaths per year. When the Cobra militia took power in Congo in 1997 the conflict killed approximately 10,000 people in less than one year of fighting. Over 14 years the Taliban and the Government of Afghanistan have averaged over 5000 deaths per year, and when the Taliban was in power their conflict with the Northern Alliance was only slightly smaller. Over two decades of fighting in Sri Lanka, the conflict with the Tamil Tigers averaged more than 3000 deaths per year.

Despite the stark difference between these large conflicts, with annual death tolls in the thousands, and the much larger group of conflicts that count only

dozens or hundreds of annual deaths, there is little existing research explaining why we see these differences across conflicts.

The cross-national variation discussed above also can be seen within countries. India has fought conflicts with 23 different rebel groups, however 17 of those conflicts average less that 100 battle deaths per year, while the conflict in Kashmir kills many hundreds per year, and in Punjab annual death tolls from fighting with Sikh groups are commonly in the thousands. All of these dyads are fighting the same national government, indicating that the differentiating factor lies within the rebel groups.

Another case of variation in conflict size within a country can be seen in Angola. UNITA and the Angolan government fought a conventional war that killed 2,500 people per year. UNITA fought against the government of Angola with a large army consisting of tens of thousands of soldiers, and largely utilized conventional tactics. During the same time period the Front for the Liberation of the Enclave of Cabinda also fought against the Angolan government, however they fought with only hundreds of soldiers and avoided direct combat, resulting in only dozens of deaths each year.

The variation in conflict intensity has important implications for the field of conflict research. Most dyad-year observations represent low intensity conflicts, while most of the violence and death caused by civil conflicts is contained within a small percentage of observations. The Uppsala Conflict Data Program (UCDP) data, when aggregated by dyad-year, contains 1137 observations that result in less that 2500 deaths, and only 77 observations with more than 2500

deaths. Those few large observations, however, account for more total deaths than the much larger collection of low-intensity dyad-years. Research that fails to address the difference between low and high intensity conflict risks applying data on low-intensity conflicts to theories that are often motivated by much larger conflicts.

Much of the current conflict literature seeks to explain conflict duration. Theories of conflict duration which seek to explain why some pairs of conflict actors are able to reach a peace agreement while others cannot, often focus on qualities of the actors or the environment in which those actors exist. Although these studies have identified important aspects of conflict which contribute to the difficulty of ending civil wars, they have largely focused on the groups involved in conflict rather than the fighting itself. I argue that in order to understand how conflicts end, we must have a better understanding of how they are fought. Conflict management efforts cannot be applied equally to small civil conflicts which see only a few limited conflict events per year and to large conflicts where armies engage in large-scale warfare. The interests and expectations of the parties to these different types of conflict are extremely different, and must be treated differently.

I argue that conflict intensity is determined by the capabilities of the rebels and the government. Both sides in a conflict make decisions about how to fight based on how large the forces on both sides are. The primary effect is that strong rebels are able to exert a large amount of force against the government in an attempt to seize power directly, while weak rebels cannot compete

with the government army in direct combat, and must instead rely on low-intensity conflict, which sees rebels engaging in only the most advantageous situations and relying on concealment to avoid being destroyed by the much more powerful government forces. Conversely, when the rebels are strong the government will dedicate a large portion of their total capabilities to fighting them, whereas governments often use a much smaller portion of their total capabilities to fight against small rebel groups, as those small groups do not pose a serious and immediate threat.

At a basic level, the higher the capabilities of both sides, the more casualties we would expect to see in a conflict. Two large armies fighting each other are capable of directing large amounts of force against the large number of soldiers in the opposing army. This situation can create massive death tolls, while much smaller forces have both less ability to wage war, and fewer combatants to kill. This simple theory indicates that as long as both sides are equally large, an increase in the size of the forces will increase conflict intensity. When one side is larger than the other, there should be a similar effect, as long as the only change is in the size of the forces, and not in the way that they behave. Without accounting for behavior, giving more capabilities to conflict actors leads to more violence.

The problem with that simply theory is that behavior does change based on capabilities. In the vast majority of cases, rebel forces are much smaller than the government army they are seeking to defeat. A small rebel group that attempts to directly challenge the state army faces little chance of victory.

Weak rebels will instead focus on growing their movement while suffering few losses themselves, and imposing large losses on the government. In order to achieve their goals, they will have to avoid defeat long enough that they are able to grow their organization. Military engagements for these small groups are politically important, but not militarily meaningful. Killing dozens of government soldiers will not cripple the state army, but can generate publicity which can lead to support from important constituencies. These small groups seek to either continue to grow, until they become large enough to directly confront the state, or they seek to impose high costs on the government while suffering few losses themselves, in order to receive concessions in exchange for ending the conflict. In either case, the rebels must choose to fight in a limited manner, resulting in a low intensity conflict.

When a rebel group grows larger they are able to alter their tactics. They can develop from conducting occasional surprise attacks against government forces, to launching more frequent attacks against harder targets. Guerrilla warfare tactics therefore develop, as the rebels grow, into conventional warfare. When the rebels have sufficiently large forces they can begin to target the government with large-scale offensives that aim to seize territory, or even take control of the state. The increased capabilities of the rebels increases their ability to fight, based purely on capabilities, but these capabilities also alter their behavior, so that they use their large capabilities more often and more directly. Where a small rebel group will wait for a particularly advantageous target, and plan a single attack carefully, a large group will fight on a regular

basis, and will not always have the luxury of waiting and planning, as they become an increasingly large target for the government to attack.

As the rebels come out of the shadows, and rely less on concealment and surprise, this allows the government to also adjust their tactics. Most states have a variety of security threats that they have to dedicate portions of their forces to. Militaries are usually oriented towards defending against foreign threats. Internal conflict is almost always a secondary concern for government armies, even when there is an ongoing civil conflict within a country. States must therefore reserve most of their forces for international defense, with a smaller portion dedicated to fighting against internal rebels. The case of India serves as a useful illustration of this point. India has a very large army, as well as several internal conflicts. Many of the rebel groups in India are very small, many with only a few hundred active fighters. Each of these groups would be relatively easy to defeat with the undivided attention of the Indian security services. India however has to divide their resources not only among numerous different rebel groups, but also dedicates most of their military resources towards preparing for a potential war with Pakistan, as well as international concerns they have with China and other neighboring states, as well as the international peacekeeping forces that India often participates in. As a result, the government allocates their resources to the most pressing needs, and dedicates relatively few resources to the least pressing rebellions. If one rebel group begins to grow in power, they will begin to attract more attention from the government, as they become more of a threat. As such, fighting will be-

come more frequent as the government also begins to target them with more resources, further increasing conflict intensity.

The size of a rebel group, and the capabilities that they possess, directly contribute to conflict intensity, by increasing their ability to fight, and altering their behavior such that they use those capabilities more frequently. Additionally, the government will increase their efforts to defeat a rebel group as the group grows. The capabilities of the government affect the rebel behavior as well. If the government improves their military capabilities it serves to deter the rebels, while a weakening government will embolden rebels and force the government to spread their forces thinner.

In addition to troop size, another important determinant of actor capabilities in a civil war is external support. In most civil conflicts an outside actor provides assistance to either the rebels or the government. This support increases the capabilities of an actor. When rebels receive support it has a direct and positive effect on conflict intensity, as the rebels use the newly provided capabilities to increase the frequency and size of their operations. Governments that receive assistance would be expected, based purely on the change in capabilities, to have a deterrent effect on the rebels, and reduce conflict intensity.

The effect of external support is not however as simple as just increasing the capabilities of one side or the other. The foreign power that is intervening in the conflict also has interests in how the conflict is fought, and the actor receiving the support has an interest in meeting those expectations, in order

to continue receiving support in the future. When external supporters give assistance to rebel groups they are usually seeking to increase the cost of conflict for the government that the rebel group is fighting, and potentially see that government replaced. Foreign powers that support governments often have their own interest in seeing the rebels defeated, possibly because the violence within the state is flowing over the border into neighboring states, or because that rebel group maintains ties with groups in other states that are in turn fighting the external supporter. In these cases the external supporter will want to see that the assistance they are providing in being translated into increased effort to fight the rebels. Both governments and rebels will fight harder, and increase conflict intensity in the process of appeasing the interests of the external supporter.

The incentive to demonstrate effectiveness to an external supporter increases conflict intensity when the support goes to rebels, in addition to the normal increase that would be expected just from increasing the capabilities of the rebels. The situation for governments is more complicated, since the capabilities themselves are expected to deter rebels, and therefore reduce conflict, however the influence of the external supporter is expected to increase the level of conflict intensity, as the foreign party encourages the state to fight harder.

In addition to simply looking at whether there is support, I also examine the type of support that is provided to the actors. When foreign governments support governments in civil conflicts the only discernible effect is when the

foreign supporter adds their own troops to the conflict, or integrates the government military into the supporting state's military and intelligence system. This sort of strong support from one government to another increases the intensity of the conflict, because the external supporter both provides substantial capabilities, and by integrating their forces with the host state they are able to play a large role in setting the agenda for the conflict. Rebels do not respond in the same way to support, and rather than troops and joint operations, rebels respond to financial assistance and the provision of intelligence. Both forms of support improve the ability of guerrilla forces to wage war against the government, while training from outside actors reduces conflict intensity.

An understanding of how actor capabilities and foreign intervention affect conflict intensity allows for a better understanding of how conflict intensity affects conflict duration. In the third paper of this dissertation I examine conflict duration as a function of conflict intensity, while also examining the effect of troop size and external support. Conflicts with intense fighting are much harder to end, with high levels of fighting encouraging actors to continue fighting in the hope of a military victory. Rebel groups that grow to the point where they are able to engage the government in regular combat are unlikely to suddenly end their efforts without good reason. Similarly, governments are often unwilling to strike a deal with a powerful rebel group, since a negotiated settlement with a powerful group often involves the rebels retaining some or all of their capability to make war. The public often pushes the government to defeat rebels and bring their leaders to justice, rather than compromise with

groups that often seen as criminals.

In low intensity conflicts termination is more likely, as rebels who have little chance of victory can cease fighting on their own, or can negotiate a peace with the government without the political complications faced in larger conflicts. Weak rebels in negotiations are faced with the option of accepting relatively minor concessions, or continuing with an armed struggle which at best promises victory only after years of continued struggle. Rebels who are only able to fight at a low level of intensity are therefore more willing to accept deals, or in the extreme will stop fighting without a deal, if they judge their chances of victory to be too low to justify the cost of fighting.

In examining the effect of conflict intensity on duration, intensity is shown to make conflicts longer, while troop size and external support are only marginally significant. This indicates that although rebel troop size and external support cause conflicts to be intense, it is the intensity itself which causes the conflicts to last longer, rather than the determinants of intensity also determining the length of the conflict. This shows that the nature of the fighting itself is affecting how conflicts end, supporting my argument that an improved understanding of the dynamics within conflicts is necessary in order to better understand how to end conflicts.

The next three chapters consist of three papers, which together explain both what causes some conflicts to have high levels of intensity while others do not, and then shows the effect of intensity on conflict duration. The first paper focuses on the effect of capabilities on conflict duration, and presents

my theory of tactical interaction between actors. It shows that the size of the rebel force is a strong predictor of conflict intensity. The second paper adds to the understanding of intensity by examining the effects of foreign actors who provide support to the parties fighting a civil conflict. External support to rebels is shown to increase conflict intensity. The third paper takes the results from the first two papers, which explain why some conflicts are more intense than others, and uses that knowledge to test what effect intensity has on conflict duration. More intense conflicts are shown to last longer. Following the three papers, I conclude with a chapter that discusses the overall importance of the combined findings.

Chapter 2

Tactical Interactions: How Rebel Strength Determines Conflict Intensity

Abstract

Some rebel groups use conventional military tactics, while many others rely on guerrilla warfare. The primary factor determining the tactics rebels use is the ratio of capabilities between the rebels and the government forces. While relative capabilities determine tactics, the level of capabilities also directly determines conflict intensity, as larger forces are capable of killing more people. This paper presents a theory of how relative capabilities determines tactical choices, and models the effects of rebel and government troop levels on conflict intensity. The results show that the size of a rebel army has a large effect on the intensity of combat, as large rebel forces are both stronger, and better able to use their strength. Because of rebel responses to government actions, the strength of government forces has only a minor effect, with larger government armies producing a minor deterrent effect, slightly reducing conflict intensity.

Civil wars vary greatly in their intensity. The Syrian civil war has killed hundreds of thousands of people. During that same time the ongoing wars in Afghanistan and Iraq claimed approximately 45,000 and 25,000 lives. In addition to these large-scale conflicts, there were nine other ongoing conflicts with between 10,000 and 1000 deaths, and a further 27 conflicts with fewer than 1000 battle deaths[1]. What explains this variation in conflict intensity?

I theorize that the capability of the rebels and government affect their choice of tactics, which in turn determines the conflict intensity of civil wars. Conflicts in which heavily armed forces square off in conventional warfare generate large numbers of casualties. Conversely, conflicts with weak rebel forces that rely on guerrilla tactics see very low levels of violence. Strong rebels are able to directly challenge the government, in order to secure their goal of taking over the state. For instance, in Syria the government's army engaged in conventional combat against well organized and armed rebels. The intense fighting across defined front lines, including aerial and artillery bombardments, has resulted in tens of thousands of battle deaths per year. The unusually large and capable rebel forces in Syria were able to openly confront the government in ways that most other rebel groups cannot. For instance, the conflict between Israel and Hamas, although highly publicized, has averaged only 152 battle deaths per year over the last three decades, due to the large power differential between the Israeli army and Hamas's militant force. Hamas is forced to rely

[1]Calculations are from the UCDP GED battle death data for state based conflicts, and only include conflicts that were active through the entire four year period from the beginning of 2012 to the end of 2015. The 38 dyadic conflicts occurred in 20 countries.

on concealment and insurgent tactics, as Israel would easily destroy Hamas if they were able to locate all of their forces.

By explaining why some civil conflicts are far deadlier than others, and investigating how the capabilities of the actors determines the level of intensity, this paper will add to our understanding of conflict dynamics. Understanding how actors make tactical choices within conflicts will improve future research on conflict dynamics, and improving our knowledge of conflict dynamics will in turn improve studies of conflict onset and duration.

I proceed to discuss the literature on civil war intensity. Then I develop a theory of how the capabilities of governments and rebels determine the tactics used by both sides in the conflict, and how this shapes conflict intensity. I then discuss the data used and the results of the analysis. I conclude by discussing the implications of this research, as well as the next steps in my research agenda, which will build on this theoretical foundation.

2.1 Literature

The existing research on civil conflict has focused primarily on how wars start and end, without paying sufficient attention to what happens during a conflict. In particular, to understand how wars end, it is important to understand how they are fought. One of the most important aspects of how a war is fought is whether the rebels use conventional military tactics, or if they instead rely on guerrilla tactics. Additionally, conflicts exhibit vastly different levels of

conflict intensity. Studies of conflict duration which do not account for the differences in conflict intensity risk comparing vastly different cases to each other in order to determine the causes of duration. By better understanding the relationship between tactics and intensity, this paper will improve the understanding of conflict dynamics, improving the ability of future research to better understand and explain variation in conflict duration.

Kalyvas and Balcells (2010) discuss the means by which wars are fought. They define conflicts as conventional wars, irregular wars (or insurgencies), and symmetrical non-conventional wars. In conventional wars, and symmetrical-nonconventional wars, the rebels and the government have capabilities that are roughly on par with each other, allowing the rebels to use military tactics similar to the government they are fighting. The difference between these two types of conflicts is in whether the government and rebels are advanced enough to fight conventionally, or whether they are fighting in a symmetrical manner, but with less sophisticated organization and tactics than what is normally considered conventional warfare. They argue that the type of tactics used are the result of the balance of power between the two actors, and find that insurgency is more common than both other types of conflict.

This paper will build on the differentiation between symmetrical conflicts and insurgencies, by examining the effect that the balance of power within a conflict has on the intensity of the fighting between the two parties. Instead of limiting the analysis to categories of conflict, such as conventional war and insurgency, I improve on Kalyvas and Balcells (2010) by conceiving of tactics

as a continuum of techniques that lie between insurgency and conventional conflict.

The effects of various tactics are discussed in Balcells and Kalyvas (2014), where they find that irregular conflicts tend to last longer than other conflicts, and have lower levels of conflict intensity. This indicates that fighting between weak rebels and a strong government will kill fewer people per year than if the rebels were stronger, in which case it would be a more intense conventional conflict. It also indicates that when both the rebels and the government are weak, the intensity of the conflict will increase, as it becomes a symmetrical nonconventional war. Balcells and Kalyvas (2014) make these findings by observing the type of fighting in a conflict, and comparing that to the number of people killed, and they infer that the capabilities of the two warring parties are what cause the selection of the tactics that they observe. In this paper I will add to this finding by examining the effect of the capabilities of both actors on conflict intensity, rather than just examining the observed tactics.

The causes of conflict intensity have received much less attention that the causes of conflict onset and duration. The existing research has followed Lacina and Gleditsch (2005), who produced the first reliable dataset on battle deaths that was comparable across countries and over time. Research on regime type and the nature of the conflict demonstrates that governments make strategic decisions regarding how much effort to put into a conflict, while research on external support and other determinants of capabilities produces conflicting expectations and results.

Research on regime type provides some insight into how governments decide how much effort to use to counter a rebellion. Civil wars in democratic countries have fewer battle deaths than wars in autocracies (Lacina, 2006; Heger and Salehyan, 2007). Autocracies are also more likely to engage in one-sided violence than democracies (Eck and Hultman, 2007). These findings demonstrate that governments make choices about the amount and type of force to use when threatened by a rebellion, and that the choices are systematically tied to regime type. Governments and rebels also alter their level of effort depending on the type of conflict. Rebellions seeking to take over the government result in more intense conflicts than rebellions over territory, indicating that governments fight harder when their control on power is threatened, and apply less effort when the threat is only to a portion of the state's territory (Heger and Salehyan, 2007; Eck and Hultman, 2007).

Research on external support, foreign intervention, and lootable resources provides insights into the effect of a shift in capabilities on conflict intensity. Increased capabilities in some cases increases intensity, however under other conditions it can decrease intensity. These mixed findings suggest that capabilities alone do not fully explain intensity. External support has been argued to increase the death toll in civil conflict (Lacina, 2006; Lacina, Gleditsch and Russett, 2006), however it has also been argued that external support encourages rebels to adopt insurgent tactics, resulting in decreased intensity (Kalyvas and Balcells, 2010; Balcells and Kalyvas, 2014). Governments that receive support from private military companies gain increased capabilities, re-

sulting in an increase in conflict intensity, as well as shorter conflict duration (Petersohn, 2015; Akcinaroglu and Radziszewski, 2012). The different predictions of how external support will affect conflict intensity result from focusing on different aspects of conflict dynamics. Lacina (2006) argues that increased capabilities allow for more intense combat, while Kalyvas and Balcells (2010) argue that external support alters the tactics adopted by the actors, leading to lower intensities. A new theory is necessary to link the concepts of capabilities and tactics.

In addition to support, actors also respond to efforts to end conflicts. Arms embargoes and the introduction of peacekeepers have been shown to reduce conflict intensity, by reducing capabilities and providing disincentives to the use of violence (Hultman and Peksen, 2015; Hultman, Kathman and Shannon, 2014). Economic sanctions have, however, been shown to increase conflict intensity, as they increase the cost of conflict and thereby incentivize the government to apply more effort to fighting, in order to end the war quickly (Hultman and Peksen, 2015). The ability of actors to alter their behavior in response to incentives demonstrates the ability of states and rebels to make choices about how they fight.

Another line of research looks at the resources available to rebel groups, with mixed predictions and findings. Access to lootable resources is variously expected to make rebels more violent (Weinstein, 2007), and less violent (Wood, 2010). Empirically it has been found that access to gems and oil increases intensity, while drug cultivation decreases intensity (Lujala, 2009).

These differences point toward a more complex relationship between capabilities and violence, with access to resources affecting not just capabilities, but also effort.

2.1.1 Contest Success Functions

Theoretical attempts to explain the level of effort actors exert in a conflict have taken the form of contest success functions (CSF). Contest success functions model each player's probability of winning as a function of all other players' efforts (Skaperdas, 1996). They have been used to understand disputes between groups, where all the actors have to make trade-offs between applying resources to economic production, or to conflict. This can take the form of political disputes between the rich and the poor over income redistribution, and struggles between labor and management (Hirshleifer, 1991). In these situations there is a symbiotic relationship between actors who are all producing into a single economy, and conflict is over the distribution of the benefits among the participants. Contest success functions have also been applied to more direct forms of conflict, such as organized crime (Skaperdas, 2001), conflict between farmers and nomads (Hirshleifer, 1991) or among groups of herders (Butler and Gates, 2012), and to civil wars dominated by warlords and bandits (Skaperdas, 2008), as well as more traditional civil conflicts (Butler, Cunningham and Gates, 2015).

The theory of contest success functions rests on the assumption that all actors have a set of resources, which can be used both to produce income that

flows into a common income pool, and to fight over the share of the common income that they will receive. Actors that dedicate resources to conflict will therefore receive a greater share of the total income, however by dedicating resources to conflict they reduce the amount of production they are contributing to the income pool. This results in an equilibrium with actors dividing their resources between production and conflict. In some cases individual actors may dedicate all of their resources to conflict, or to production, or they may divide their efforts between the two.

Contest success functions generate steady-state estimates of how much effort actors will put into fighting, in a situation of repeated interaction. This has been applied to theories of civil war, however it is only applicable to cases of low-level conflict, where the actors fight over the income being produced, but are unable to seize the resources used to produce that income (Hirshleifer, 1991). Resources are considered to be exogenous to the CSF, and to be invulnerable to seizure. The contest is over the income derived from these productive resources, not the resources themselves. Hirshleifer (1991) discusses nomads and farmers as one such situation, where the nomads divide their efforts between herding and raiding agricultural settlements, and the farmers divide their efforts between farming and defending themselves. In this situation the nomads can steal crops from the farmers, but they never steal the farms themselves. He argues that his model applies to protracted cold wars, or to low-level conflicts between bandits and warlords, but not to conflicts that include irreversible victories. This limits their ability to model

behavior within civil wars where the benefits from winning the war eclipse the income that can be captured by actors during the war.

Contest success functions cannot fully capture the logic of civil wars in which a victorious party is relieved of the need to fight in the future and is guaranteed access to all, or a portion, of the future income of the state. They do however provide an important example of a decision process that actors have to make during an ongoing conflict. Instead of focusing on the decision between producing income and attempting to control a larger share of that income, the theory in this paper will focus on the decision actors make as to how best to win a war, in order to cease fighting altogether, and receive the benefits of that victory in the future, without paying the cost of fighting.

2.2 Theory

Some conflicts kill hundreds of thousands of people, while others only manage to kill dozens. Some start out small and increase over years, while others begin with major combat and gradually fade away over time. What are the causes of these differences? I argue that the military capabilities of the government and the rebels determine conflict intensity, both by directly determining the amount of fighting potential, as well as by altering the means by which the two groups fight. More capable forces will kill more people, all else being equal. However, both governments and rebels make strategic decisions regarding how they should fight. States rarely put all of their resources into fighting rebels,

and rebel groups often decide to only select into battles they think they can win. I argue that the intensity of fighting is not only a function of the strength of the actors, but is also dependent on the balance of power between them, which determines how their capabilities are put to use. How capabilities are put to use is based on the tactical decisions of rebels, and the response of the government. The methods that rebels use falls on a continuum from guerrilla warfare to conventional warfare, with implications for how effectively they use their capabilities, as well as how the government responds to their actions.

Rebels use violence to achieve their goal of political change. The goals of different groups vary, with many seeking to overthrow the government and seize power, while others have more limited goals, such as secession, achieving regional autonomy, or forcing the government to make other policy concessions. Violence allows the rebels to achieve these goals either directly, by defeating the government militarily, or through negotiations, whereby rebels seek to impose high costs of conflict on the government, so that the government will be willing to give in to the rebels demands rather than continue to pay the cost of fighting. An additional way that rebels use violence is to demonstrate the effectiveness of the rebel group to third parties, such as domestic constituencies or potential foreign sponsors. All three of these uses of violence are furthered by the rebels killing large numbers of government soldiers. When rebels are able to fight effectively and defeat government forces they move themselves one step closer to defeating the government or coercing the government into agreeing to their political demands. Rebels who illustrate their effectiveness

are also able to publicize their cause and attract more support and recruits. Rebels therefore seek to fight in the most intense manner possible, without opening themselves up to unsustainable losses.

An increase in the capabilities of one actor will allow them to fight better, directly contributing to an increase in conflict intensity. However, increased capabilities also alter the strategies of the actors. When the rebels increase in capabilities they will be able to take bolder action against the government, and the government will be forced to direct more of its efforts at the rebels to counter their increased strength. This increases the amount of direct combat between the two sides, and greatly increases total intensity. Conversely, when the government increases in strength the rebels withdraw and become more selective about entering combat, reducing the number of engagements between the rebels and the state. Rebels that face difficulty directly attacking government forces will be forced to reduce the number of attacks they conduct against military targets. They may redirect some of their resources toward soft targets, and will be much more careful about engaging directly with the government. Hence, increasing capabilities of governments will slightly reduce intensity, while increased capabilities for rebels will greatly increase intensity.

Absolute and relative power affect conflict intensity. Strong rebels can launch frequent attacks on government forces, and strong governments are able to actively and successfully locate and attack rebels. Increasing the absolute strength of either actor will increase the amount of force that they are capable of deploying in a conflict. However, simply possessing capabilities does not

lead to increased intensity, as actors choose strategically how they will use the resources at their disposal. Strategic decisions of how much effort to put forth are explained by the relative power of the actors. When rebels are at, or near, parity with the government the conflict will be more intense. When they are at parity either side can launch an attack at any time, stripping the rebels of the initiative and increasing the intensity of conflict. When the rebels are weaker they will rely on concealment to avoid the government forces, and only launch occasional attacks, and the government will face less urgency in dealing with the relatively low threat posed by the rebels. As the rebels become larger they cannot rely on concealment and it is no longer possible to fight as small guerrilla forces.

Below I will first describe a simple model of military capabilities affecting conflict intensity, in which conflict intensity is a simple function of the capabilities of both sides. I will then add to that theory a logic of tactical choice, creating a more complete model that explains conflict intensity as a function of both relative and absolute capabilities. This tactical model provides a better understanding of how capabilities affect intensity than the standard model based purely on capabilities.

2.2.1 Capabilities Model

The intensity of civil wars is based on the capabilities of the actors, as civil war actors who are attempting to defeat their enemies will use higher levels of capabilities to kill more enemy soldiers. Conflict intensity measures the

number of battle deaths within a period of time. The larger the ability of the actors in a civil war to generate military force, the higher the intensity of a conflict will be. The capability of a fighting force is based on many factors, including training, organization, and material factors such as armaments and equipment. The fundamental factor of capabilities, however, is the number of fighters an organization possesses. The number of fighters provides a baseline level of capability, which can be increased or decreased by other qualities of an organization. Large armies are capable of applying large amounts of force against each other. In wars where such armies engage directly with each other the level of intensity will be high. When both sides are relatively weak the level of intensity will necessarily be lower, as small groups have fewer combatants and therefore can inflict less damage on the enemy.

In cases where one actor is much larger than the other, the more powerful actor will be limited in their ability to use force by the small size of the opponent. This creates an interactive relationship, as even a very large force is limited in how much force it can bring to bear against a much smaller enemy. The interactive nature of the relationship is important for modeling asymmetric conflict, as a large army fighting a small rebel force will be unable to create a large body count, even if they are very successful, since the number of rebels present for them to kill is very small, while in that context the rebels would be expected to produce little deadly force, and therefore they would kill few government soldiers. Intensity will therefore be proportional to the product of the capabilities of the government, c_g, and the capabilities of the

rebels, c_r.

$$Intensity = c_g \times c_r \tag{2.1}$$

This equation produces the relationship shown on the left side of Figure 2.1, for a realistic range of rebel and government capabilities, represented by number of troops. Red corresponds to higher levels of intensity, while white represents low intensity. The graph of the capabilities model illustrates the prediction that an increase in capabilities for either side will increase conflict intensity. If both actors are very weak intensity will be very low, while if both are strong intensity will be very high. As the government becomes stronger their ability to react to the rebels increases, and for a fixed size rebel force the stronger the government is the more intense the conflict will be. As government strength increases, the gradient of intensity increases, with the level of intensity depending largely on the strength of the rebels. For instance, a strong government in a conflict with an exceptionally weak rebel group will only produce a small amount of intensity, however if that same government was fighting a larger rebel group the predicted intensity would be much higher. The same effect holds true for the rebels, as the capabilities model does not predict a different effect for rebel capabilities or government capabilities. An increase in rebel strength will cause an increase in conflict intensity.

2.2.2 Tactical Model

The capabilities model, described above, assumes both actors are fighting using fixed tactics. The actors are assumed to use their capabilities against the enemy in a fixed manner, with the only variable being number of troops. The capabilities model is therefore a model of absolute capabilities, and ignores the effect of relative capabilities. In fact, both governments and rebels adjust their tactics to account for the balance of power in the conflict. There are a wide range of strategic and tactical decisions made by military forces in a civil war. Taking the capabilities model and building on it to include an element of tactics creates a new model, which I call the tactical model.

The primary tactical choice that rebel forces must make is between guerrilla warfare and conventional warfare. Although these two technologies of conflict are often conceived of as distinct methods, I view the choice of tactics as a continuum, on which rebels can place themselves anywhere between guerrilla and conventional. This incorporates both mixed strategies, where rebels can sometimes launch large operations and at other times rely on hit and run tactics, as well as hybrid style of conflict where the methods employed by the rebel force resemble large-scale guerrilla warfare, or small-scale conventional conflict.

Rebels can choose where to place themselves along this continuum of tactics. I propose that they choose their tactics based on their relative strength. Rebels that are weak relative to the state will rely heavily on guerrilla tactics. Small rebel groups will avoid defeat by using concealment to prevent the much

more powerful government forces from destroying them, while launching hit and run guerrilla attacks from their hidden sanctuaries. These groups cannot jump directly to conventional warfare, but instead must focus on building up their forces, often utilizing sanctuaries or protected bases where they can develop their fighting force without being directly targeted by the government. They will avoid the many potential combat situations in which they would be at a disadvantage, and only engage in combat when a particularly advantageous situation presents itself. This sort of group, which is much weaker than the state, will therefore avoid many combat situations. The government will be unable to kill the rebels due to their concealment, and the rebels will only attack state targets occasionally.

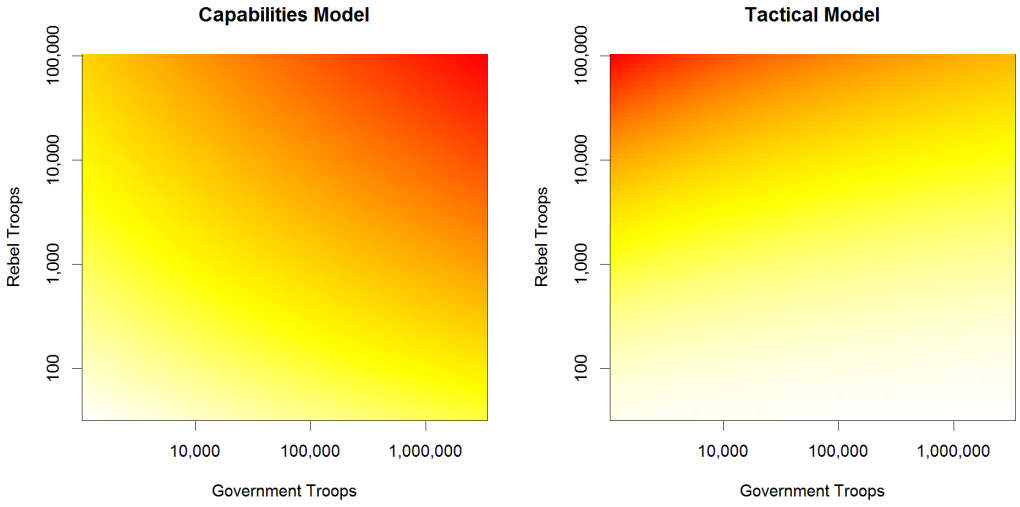

Figure 2.1: Predicted Conflict Intensity by Government and Rebel Capabilities

Stronger rebels will adopt more conventional tactics, organizing their fighters into regular forces. When the relative strength of the rebels, in comparison

to the government, is higher, they will be able to fight the government on more equal terms. A rebel group with capabilities equal to those of the state would not need to occupy itself with avoiding government attacks, and would be presented with many potential targets of which they could take advantage. Instead of being careful about what battles they select into, they would be able to launch many attacks against the state forces. Rebels who are approaching parity with the government, or who are more powerful than the government, will use their strength to full advantage to try to seize control of the state from the government.

States face a similar decision, although their calculations follow a somewhat different logic. Governments face a large number of threats, and although rebellions are always of concern to the state, they are not always the primary concern. When deciding how to distribute security force resources the government must weigh numerous priorities. All states face potential external and internal threats. Interstate wars, rebellions, and enforcing general law and order are all rival demands for resources. States with significant external military threats will position a large portion of their forces in preparation for an interstate war. Conversely, states facing a threat from a large rebel group will dedicate more of their resources to fighting that internal threat. At the same time, there is always a threat from still unknown sources, requiring states to maintain some forces in reserve, often distributed throughout the country, in case they are needed.

Because of the competition for resources, the proportion of government

forces that are dedicated to an internal rebellion will be proportional to the threat they perceive from the rebels. When the rebels have a high level of relative strength, and pose an imminent threat to the government, the state will dedicate a large proportion of their forces to fighting the rebels. When the rebels have a low level of relative strength, such that they pose little threat to the stability of the government, the state will balance the small threat from the rebels against the other threats facing the government. The decision facing the state is, in its full calculation, one of weighing several priorities, however without knowing all of the security threats facing a state, it is reasonable to assume that as the relative strength of the rebels increases, the degree of resources the government dedicates to fighting them will increase.

Incorporating tactics into the theory of how capabilities affect intensity requires adding a scaling factor for both rebel and government capabilities. For the rebels, the scaling factor indicates how their choice of tactics affects the frequency and lethality of their attacks, while for the government the scaling factor represents the proportion of total resources that they dedicate to the conflict. Building on the capabilities model, described above and summarized in equation 1, the tactical model adds a scaling factor to both c_g and c_r. This means that conflict intensity is still proportional to the product of the capabilities of the two sides, however their raw capabilities are altered by their tactical decisions of how to employ those capabilities. Their capabilities are modified by the tactics they use, indicated by t_g and t_r. Building on equation 1, and adding a scaling factor for tactics, which is multiplied by the capabilities

of the actors, produces equation 2.

$$Intensity = (t_g c_g)(t_r c_r) \tag{2.2}$$

The tactical decisions of both the government and the rebels are different, with rebels choosing between guerrilla and conventional methods, while the government decides on a proportion of resources. There is, however, a similar effect for both. As the rebels increase in relative strength, they move toward conventional tactics, and their attacks become more frequent, increasing their effectiveness at generating battle deaths. A similar effect happens on the government side. As the rebels increase in relative strength the government dedicates more of their resources to the conflict with the rebels, increasing the number of battle deaths they can inflict on the rebels. Despite the different reasoning for how tactics affect the use of raw capabilities, in the case of both the government and the rebels, an increase in relative capabilities results in the absolute capabilities having a larger effect. The scaling factors representing tactics introduced in equation 2, t_g and t_r, are therefore both proportional to the ratio of rebel to government capabilities, such that $t = c_r/c_g$. Substituting this for t_g and t_r gives the following equation.

$$Intensity = \left(\frac{c_r}{c_g} c_g\right)\left(\frac{c_r}{c_g} c_r\right) = \frac{c_r^3}{c_g} \tag{2.3}$$

The ratio of rebel to government forces, c_r/c_g, represents the relative strength of the actors, which are multiplied by the absolute strength of the

actors, c_g and c_r. Because relative capabilities is a ratio of the absolute capabilities of the two actors, the equation reduces to a function of government and rebel capabilities. The result shows that, after accounting for tactical factors affecting how the government and rebels use their capabilities, an increase in rebel forces results in conflict intensity being increased, at a cubic rate, while an increase in government strength moves to the denominator, indicating that stronger government forces will result in lower levels of intensity.

The logic of the tactical model is based on the combined effect of absolute and relative capabilities. Larger amounts of absolute capabilities have a direct effect on conflict, as described in the capabilities model. Essentially, the more capable a fighting force is, the more people it will be able to kill. When tactical decisions are added to that model we find that as rebels get stronger, not only are they better able to kill due to their size, but they adjust their tactics to make the forces they already possess more deadly, by engaging in conventional warfare. On top of that, the government also increases the amount of resources they are dedicating to conflict, meaning that the increased number and lethality of the rebel forces interacts with a larger state force, creating more opportunities for both sides to kill enemy soldiers and generate more battle deaths. The prediction of a cubic effect for the level of rebel capabilities results from the triple effect that raw capabilities has on the rebels, the effect that rebel strength has on rebel tactics, and the effect that rebel strength has on government tactics. Government strength moves to the denominator, and is linear, because the effect of increased government capabilities will have a

positive effect on the raw capability of the government to fight, however that will be countered by a reduction in the relative strength of the rebels, which alters both rebel and government tactics.

The predictions of the tactical model can be seen on the right side of Figure 2.1. The graph represents the predicted level of conflict intensity as a function of rebel and government capabilities, for realistic values of capabilities. Because the tactical model predicts a larger effect for rebel capabilities than for government capabilities, the gradient from low rebel troop sizes to high levels of rebel troops is much larger than for different levels of government troops. At any particular number of government troops, as the number of rebel troops increases the conflict intensity is predicted to increase at a very fast rate. Conversely, if rebel troop size is held constant, and government troop size is increased, conflict intensity will *decrease*, albeit at a slow rate. This results in a prediction of high conflict intensity when the rebels are very strong, and the government is weak, while intensity will be at its lowest when the government is very strong and the rebels are weak. These predictions represent the theory that strong rebels will be bolder in their own actions, and will provoke strong responses from the government, resulting in high intensity, while strong governments will have a deterrent effect that will discourage the rebels from engaging in potentially disastrous combat against the state.

2.2.3 Evaluation of models

The capabilities model presents a relatively simplistic view of how actors interact in a civil conflict, and predicts a symmetrical relationship, where an increase in capabilities will cause an increase in intensity. The tactical model presents an improved understanding of how actors make choices about how to fight within a conflict. This improved view takes into account that rebels and governments are not equal actors, not only because the government is usually more powerful than the rebels, but also because in a civil conflict the government already possesses the political power which the rebels are seeking to gain. The capabilities model would apply to an interstate conflict, where two sovereign states compete in a symmetrical manner, but fails to capture the complexity of a civil conflict in which the rebels have, at least initially, no political or legal authority, as well as being militarily weaker than the government.

The predictions for the capabilities model and the tactical model, both shown in Figure 2.1, differ in two important ways. First, the capabilities model predicts that an increase in capabilities for either actor will increase conflict intensity, while the tactical model predicts that increased rebel capability will increase intensity, while increased government capability will decrease intensity. Second, in the capabilities model the effect of an increase in capabilities for either actor will have an effect of the same magnitude. In the tactical model the size of the effect is much larger for the rebels than it is for the government.

The direction of effect of capabilities on intensity is different across models.

The symmetry of the capabilities model results in positive predictions for effect of both government capabilities and rebel capabilities. It also predicts that the size of the effect will be the same. The lowest intensity conflict will be one with small forces on both sides, and the highest intensity conflict will be one with large forces on both sides. This stands in stark comparison to the prediction from the tactical model, where the highest intensity conflict would involve a large rebel force fighting a smaller government army. The logic behind this being that in that case the rebels would direct all of their forces against the enemy in conventional warfare, and the state would use every asset they possessed to resist, resulting in a high intensity conflict[2]. Conversely, the lowest intensity conflict would be one in which a small rebel force opposes a very large state army. Highly outmatched rebels will be deterred by the strength of the government and will launch very few attacks against state forces, while relying on concealment to avoid being wiped out.

Hypothesis 1 *Increases in rebel capabilities increase conflict intensity.*

Hypothesis 2 *Increases in government capabilities decrease conflict intensity.*

The magnitude of the effect of capabilities on intensity also varies between the models. The capabilities model is straightforward in the prediction that

[2]In a situation where the rebels are much stronger than the government it should be noted that although intensity may be high, the conflict will also likely be short, as the rebels will have a high probability of defeating their weaker government opponents quickly. Hence, although intensity, defined as deaths over time, may be high, the total number of battle deaths in the conflict may be low.

an extra soldier on either side will increase the capabilities of that side, and an increase in capabilities will result in an increase in intensity. It does not matter which side the extra soldier joins. However, the tactical model incorporates dynamics which alter not only the direction, but also the magnitude of the effect. An extra rebel soldier increases the power of the rebels, as well as how both the rebels and the government use their capabilities. All three of those factors have positive effects, resulting in a large increase in intensity for an increase in capabilities for the rebels. On the government side an increase in capabilities is offset by tactical dynamics that cause the rebels to become increasingly cautious, while the government may dedicate those extra resources to other threats because the rebels no longer seem to be a major threat. The asymmetric effect is such that the effect of rebel capabilities on intensity will be much larger than the effect of government capabilities.

Hypothesis 3 *The effect of rebel capabilities on conflict intensity will have a larger magnitude than the effect of government capabilities.*

2.3 Data

Conflict intensity represents the degree of fighting between two armed actors. Empirically, this concept is best represented by the number of battle deaths that result from combat between these two actors, within a given period of time. Battle deaths include all deaths resulting from traditional battlefield fighting, as well as guerrilla warfare, and other military tactics which aim to

target the other warring party (Wallensteen and Sollenberg, 2001). Although a measure of battle deaths only captures lethal combat, and omits small military engagements that do not result in fatalities, it does distinguish between small conflict events that result in few deaths, and major engagements that kill many. This produces a more useful variable to distinguish between small-scale guerrilla warfare and major conventional war, which allows for the testing of the concept of conflict intensity, as defined as the amount of fighting that is taking place between the warring parties.

The Uppsala Conflict Data Program (UCDP) measure of battle deaths includes all deaths that result from fighting between the two warring parties. This includes both combatants who die in fighting, as well as civilians who die as an indirect result of the attempts of the two warring parties to fight each other. It does not include civilian deaths resulting from the deliberate targeting of civilians. This paper seeks to understand the choices that armed groups make in fighting against other armed groups. The tactics that they choose to adopt in terms of how to fight the enemy are reflected in the number of deaths resulting from combat more than in the direct targeting of civilians.

Previous work has shown that the targeting of civilians is most common when rebels adopt guerrilla tactics, and the government is forced to target the civilian support base of the rebels in place of engaging in combat with the rebels directly (Valentino, Huth and Balch-Lindsay, 2004). Additionally, weaker rebels have been shown to use more violence against civilians, in order to coerce cooperation from the local population (Wood, 2010). Both of these

papers point towards an inverse relationship between battle deaths and civilian deaths, where conflicts that involve weak rebels who use guerrilla tactics have high levels of civilian deaths as a result of the fact that these conflicts have low levels of direct combat between the actors. Essentially, targeting civilians is a substitute for the targeting of enemy forces, and both governments and rebels resort to killing civilians when they are unable to find and kill their opponents.

An analysis of the relationship between battle deaths and civilian deaths that result from purposeful killing of civilians is included in the appendix, and shows that civilian deaths constitute a substantially larger percentage of total deaths in small conflicts than in larger conflicts. If a measure of the total deaths in a conflict were used in place of battle deaths, the ability to distinguish between conflicts with intense combat and those with low levels of combat would be limited, as the amount of combat in low levels conflicts would be obscured by the increased number of deaths resulting from the purposeful killing of civilians. For the purpose of explaining why some conflicts exhibit intense combat while others do not, it is important to analyze deaths resulting from combat, and not from the deliberate targeting of civilians. Including civilian deaths would alter the analysis, and while answering important questions about the welfare of civilians in combat zones, it would interfere with understanding how the capabilities of the warring parties affect their choices of how to fight.

The data on battle deaths has drastically increased in quality over the

last few years, allowing for more detailed research into conflict intensity. The most commonly used data in the existing literature on conflict intensity is the PRIO Battle Deaths Dataset, which contains conflict-level battle death data from 1946-2008. (Lacina and Gleditsch, 2005; Lacina, Gleditsch and Russett, 2006). That dataset consists of annual observations, at the conflict level, with deaths from multiple dyadic conflicts often being aggregated into a single conflict. The sources of the data are primarily secondary sources, which often provide aggregate estimates for deaths over the entire conflict. This results in many conflicts having the same estimated number of battle deaths for several years in a row, illustrating the imprecision of the data.

Newer data, from the Uppsala Conflict Data Program (UCDP) Georeferenced Event Data (GED) (Sundberg and Melander, 2013) records conflicts at the level of individual conflict events. It includes dates and locations for individual conflict events with global coverage, except for Syria, providing much more detailed and reliable information about the number of deaths resulting from combat, including the source of the information on each individual conflict event. UCDP GED covers the years 1989 through 2016. The data is recorded at the dyadic level, with distinctions between state-based, one-sided, and non-state violence, as well as estimates of the number of battle deaths resulting from each event. The battle death estimates include a low estimate, a high estimate, and a best estimate, which is judged by the coders to be the most likely number of deaths. GED data has not been used extensively in the conflict intensity literature, however it is the only source of dyad-level intensity

data.

There is limited existing research in the dynamics of intensity largely because yearly data does not provide the necessary resolution. There is only one study that models autoregressive trends in conflict intensity data (Chaudoin, Peskowitz and Stanton, 2015), and researchers have just begun to use monthly intensity data (Hultman and Peksen, 2015; Hultman, Kathman and Shannon, 2014). The GED data records most conflict events by the day on which they occur, although some cases are given a range of time, either because they span multiple days, or the exact time of the even is unknown. Although this presents the potential for analysis of intensity over time with much more accuracy than is possible using yearly data, for this analysis the dyadic battle deaths have been aggregated to the year, as all of the independent variables are coded annually.

Table 2.1: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Battle Deaths	942	551.253	1,750.485	0	30,633
Gov Troops	942	535,210.200	761,354.300	2,000	3,047,000
ln(Gov Troops)	942	12.157	1.624	7.601	14.930
Rebel Troops	942	6,151.275	10,391.680	30	97,000
ln(Rebel Troops)	942	7.844	1.366	3.401	11.482
Polity	942	1.387	6.054	−9	9
Population	942	189,199,792.000	362,241,300.000	606,844	1,324,655,000
GDP/capita	942	3,193.813	6,198.305	161.834	32,954.230

Capabilities are measured using data compiled by Aronson and Huth (2017). The data consists of dyad-year observations, with the number of soldiers in

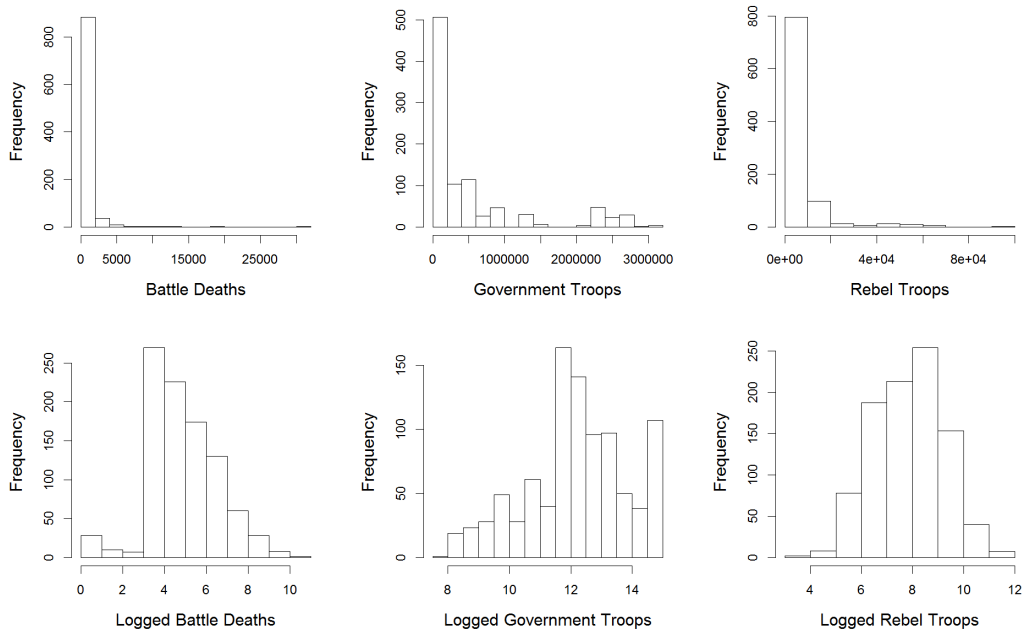

Figure 2.2: Distribution of Battle Deaths and Troops

each rebel group, as well as the total number of soldiers in the state army. Troop size data is available from 1975 to 2015 for rebel groups, however government troop numbers are only available from 1989 to 2014. The distribution of troop sizes is heavily skewed, as shown in Figure 2.2. Rebel groups have a mean of 6,151 troops and a maximum of 97,000, while governments on average have 535,000, and a maximum value of 3,000,000. For this reason troop numbers, as well as battle deaths, are logged in the analysis.

There are 213 rebel groups in the data. Most rebel groups have very low numbers of troops, while others have tens of thousands. For instance, the Nigerien rebel group Coordination de Résistance Armée (CRA), was active only in 1994, and had only 40 fighters. Conversely, the Eritrean People's Liberation Front (EPLF) averaged 56,250 fighters. The number of troops for groups also varies significantly over time. UNITA operated for 12 years within the time frame of this analysis, with troops levels starting at 45,500, growing to a peak of 61,250, and then falling to 15,000 in 2002.

For government troops, there is also extensive variation. The median state army had 184,000 soldiers, and the mean was 535,210. At the low end Lesotho had only 2000 soldiers in 1998, and Djibouti and Tajikistan both had only 3000 in the early 1990s. There are ten other states that also had armies with less that 10,000 troops for at least one year. At the upper end of the spectrum is India, with a high of over 3 million soldiers in 2005[3], followed by China, Russia, and Iraq, which all possessed more than 1 million soldiers for at least

[3]India's military increases in size from 1.26 million in 1989 to 3.05 million in 2005, and then declines in size to 2.75 million in 2014.

one year in the dataset.

Control variables for population and GDP per capita come from the World Bank. Regime type data is from the Polity IV Project. There is some missing data for control variables. Polity data is missing for some dyad-years in Afghanistan, Iraq, and Somalia, which Polity codes as cases of foreign interruption of government. World Bank GDP data is unavailable for some years in Afghanistan, Cambodia, Libya, and Somalia

2.4 Analysis

The effect of capabilities on conflict intensity can be tested in a dyad-year analysis of battle deaths on the number of government and rebel troops. Because battle deaths are counts this analysis can be done using a negative binomial model. It can also be tested by using an ordinary least squares regression with logged battle deaths as the dependent variable. Existing studies of conflict severity have used both negative binomial estimation (Schutte, 2014; Hultman, Kathman and Shannon, 2014; Hultman and Peksen, 2015; Eck and Hultman, 2007; Beardsley, Cunningham and White, 2016) and ordinary least squares with a logged dependent variable (Petersohn, 2015; Lujala, 2009; Lacina, Gleditsch and Russett, 2006; Lacina, 2006; Butler, Cunningham and Gates, 2015). Studies which have used both negative binomial and ordinary least squares regression of a logged count of battle deaths report similar results (Heger and Salehyan, 2007; Balcells and Kalyvas, 2014). All analyses reported here are

done with negative binomial models. Regressions using ordinary least squares produced similar results, and are shown in the appendix.

Negative binomial regressions of battle deaths on logged rebel and government troops are shown in Table 2.3. To correct for correlation within dyads, all reported regressions include random intercepts by dyad. Negative binomial regressions without random intercepts are shown in the appendix, in Table 2.3. Table 2.3 shows that government forces do not have a significant effect on battle deaths, while the number of rebel troops has a highly significant positive effect. This result provides support for hypotheses 1, as rebel troops are significant, and in the predicted direction. Although government troop levels are not significant, they do have a negative sign in all models, indicating that more troops could decrease the expected number of battle deaths, while rebel troop levels increase battle deaths.

These results also support hypothesis 3, since the effect of rebel forces is much larger than that for government forces. The difference between the effect of rebel troops and government troops is statistically significant, based on an asymptotic Chi-squared statistic using Wald-tests of restricted models. This supports the theory of the tactical model, that not only will the direction of effect be positive for rebels and negative for the government, but that changes in rebel troops have a much larger effect than they do for the number of government troops.

To control for possible confounding factors, I included variables for regime type, population, and GDP per capita. All three variables could potentially

Table 2.2: Effect of Capabilities on Battle Deaths with Random Intercepts by Dyad

	Dependent variable:		
	Battle Deaths		
	(1)	(2)	(3)
ln(Gov Troops)	−0.020	−0.019	−0.958
	(0.081)	(0.080)	(3.590)
ln(Gov Troops)^2			0.104
			(0.315)
ln(Gov Troops)^3			−0.004
			(0.009)
ln(Reb Troops)	0.570***	−1.303	−1.383
	(0.042)	(3.211)	(1.622)
ln(Reb Troops)^2		0.196	0.201
		(0.434)	(0.215)
ln(Reb Troops)^3		−0.006	−0.006
		(0.019)	(0.009)
Polity	−0.014	−0.015	−0.010
	(0.013)	(0.013)	(0.012)
ln(Population)	−0.050	−0.048	−0.011
	(0.091)	(0.089)	(0.087)
ln(GDP/capita)	−0.159**	−0.156**	−0.147**
	(0.074)	(0.073)	(0.068)
Constant	2.933**	8.379	10.716
	(1.225)	(7.684)	(14.170)
Observations	942	942	942
Log Likelihood	−6,117.016	−6,113.746	−6,113.523
Akaike Inf. Crit.	12,250.030	12,247.490	12,251.050
Bayesian Inf. Crit.	12,288.820	12,295.970	12,309.220
Note:			*p<0.1; **p<0.05; ***p<0.01

affect both the size of rebel groups, as well as the number of battle deaths in a conflict. Population directly affects the ability of rebel groups to recruit fighters, and the size of state armies correlates with population. The ability of rebel groups to recruit members could be increased in authoritarian states, and the number of battle deaths could also be increased by authoritarian governments using more force in their attempts to defeat a rebellion. GDP per capita has the potential to have a similar effect, with rebel groups in poorer countries recruiting more fighters due to lower opportunity costs for young men to join rebel groups. The military in poorer states may also resort to using excessive violence in place of using more expensive and complicated methods.

All three controls appear to have little effect on conflict intensity. In an unreported regression of the three control variables on conflict deaths, without including the rebel and government troop variables, regime type is significant, while GDP per capita and population are only significant at the 0.1 level. When including government and rebel capabilities regime type and population fall out of significance, indicating that these controls have little effect on intensity after accounting for capabilities. GDP per capita remain significant.

The theory of tactical interactions argues that the effect of rebel troops on conflict intensity should not only be larger than the effect of government troops, but also that additional rebel troops should have an exponential effect on intensity. To test this theory squared and cubed terms are included for rebel troops in model 2. In model 3 polynomial terms are also included for

government capabilities, to test whether the effect is linear, as predicted by the model.

Model 2 reports the results of regression with a polynomial term for rebel forces. Because polynomial terms are all based on the same base term, it is not possible to determine the significance of a variable from the significance level of one of the polynomial terms included in the regression. The coefficients for the linear, squared, and cubed terms must be tested for joint significance. In model 2, although the individual coefficients for the three rebel troop variables are each individually insignificant, those three polynomial variables for rebel capabilities are jointly significant[4]. In model 3 the polynomial for rebel troops remains highly significant, while the polynomial for government troops does not reach significance. A likelihood ratio test comparing model 2 to model 3 is insignificant, indicating that allowing government troops to take a non-linear form does not improve model fit significantly.

Predictions of the effect of rebel and government troops on battle deaths can be seen in Figure 2.3. At low levels of rebel troops the predicted effect of an increase in troop levels is relatively small, and as the number of rebel troops increases, the effect of an increase in troops has a larger effect on the number of battle deaths. For government troops, the predicted number of battle deaths is largely constant across different levels of government forces, with a slight decrease for particularly large government armies. The effect

[4]Joint significance was determined using a likelihood ratio test comparing the model to an otherwise identical model that omits all three terms. Significance can also be seen visually from the predicted counts in Figure 2.3.

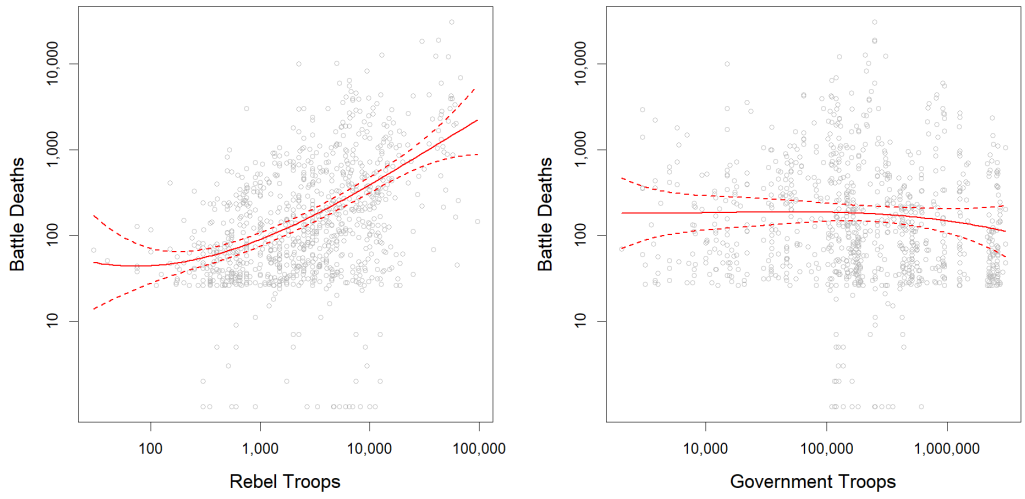

Figure 2.3: Predicted Battle Deaths

of government capabilities on battle deaths is, however, not large enough to reach significance. Hypothesis 3 predicts that the effect of rebel strength on intensity will be much stronger than the effect of government strength, and that proposition is strongly supported by the comparison shown in Figure 2.3.

2.4.1 Comparison of Formal and Empirical Models

In addition to the hypothesis tests described above, the empirical results can be directly compared to the predictions of the theoretical models. The graphs of predicted conflict intensity as a function of government and rebel capabilities, which were presented in the theory section, are repeated in the first two graphs in Figure 2.4. Darker areas on the graphs indicate higher levels of predicted intensity. The circles on the graphs show all of the observations in the dataset,

with the size of the circle corresponding to the number of battle deaths in that dyad-year. The third graph shows the predicted count of battle deaths from empirical model 3. The empirical model has a very strong vertical gradient from light to dark, as rebel troops increase, combined with a much less drastic horizontal effect, with government strength decreasing intensity slightly. This pattern resembles the predictions from the tactics model much more closely than it does the capabilities model, which predicted increasing deaths resulting from increasing government capabilities.

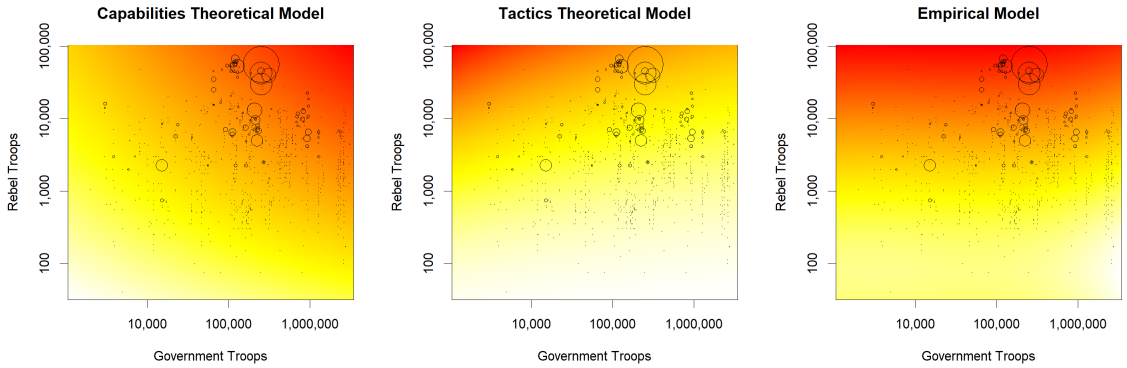

Figure 2.4: Predicted Intensity, by Rebel and Government Capability.

In order to control for the possibility of an endogenous relationship between capabilities and battle deaths, I control for the number of battle deaths experienced by a dyad in the previous year. The appendix includes results from replications of models 1, 2, and 3, with lagged battle deaths added as a control variable. Including lagged deaths corrects for the effect of deaths in the previous year reducing capabilities, and in turn deaths, in the present year. Lagged deaths are highly significant, and including the lagged dependent

variable increases the significance level of all other variables, indicating that the primary result is not a result of endogeneity. When controlling for lagged battle deaths the effect of government troops becomes highly significant, with a negative effect that is largest when government troops are between 100,000 and 300,000.

2.5 Example: The Kurdistan Workers Party

To illustrate the effect that the capabilities of rebel groups and governments have on the intensity of conflict, an illustration is presented here, of one case of conflict intensity increasing and then decreasing as a result of changes in the capabilities of the actors. This example provides a detailed view of a single case, to complement the cross-case statistical analysis described in the analysis section, and combines description of the data used in the main analysis with a discussion of the events specific to this case which caused changes in the capabilities of the rebels, and in turn affected conflict intensity.

The conflict between the Kurdistan Workers' Party (Partiya Karkeran Kurdistan, or PKK) and the government of Turkey illustrates the relationship between rebel capability and conflict intensity. The PKK was formed in 1978 by Abdullah Öcalan, who was active in socialist student organizations. As a socialist organization the PKK stood out from other Kurdish nationalist groups, which were primarily conservative tribal organizations.

In 1979 the PKK began what was known as the Urban War, originally not

targeting the government itself, but instead focusing on groups that supported the government, as well as rival Kurdish organizations. As the Urban War began, Öcalan left Turkey, and led the PKK from the Bekaa Valley, in Lebanon, where he received support from Fatah and the Syrian Government. At this stage the PKK was a small organization that launched occasional attacks against soft targets, as they were not yet strong enough to conduct larger operations.

In the first two years of the conflict the PKK was relatively small, compared to its highest levels, which were reached in the 1990s. The UCDP data begins in 1989, however court records from trials following the 1980 assassination of the Turkish Prime Minister by leftist organization Dev Sol, and a subsequent military coup, provide some information. A series of military tribunals sought to attribute 5,388 political killings to the organizations responsible. Their records show that the PKK had killed 240 people, while 1,100 PKK members had been killed. This puts their level of violence in the 1979-1980 period well below the high point within the data available for this paper. The conflict between the Government and PKK produced only 1340 battle deaths in 1979-1980, which is far below the peak of 4,337 deaths in 1997.

Following the 1980 trials, much of the membership of the PKK was in prison, with most of the remainder fleeing to Lebanon. The organization focused on rebuilding itself in Lebanon, with support from Syria, Palestinian groups, the Armenian Secret Army for the Liberation of Armenia, as well as reported support from the Soviet Union. Additionally, the beginning of the

Iran-Iraq war allowed the PKK to operate in northern Iraq, where they cooperated with the KDP. Following the Gulf War, the Iraqi government supported the PKK, as retribution to Turkey for supporting the US in that war.

In 1984, as the PKK grew in size, they declared a Kurdish uprising. The PKK began to use increasingly aggressive tactics, and launched paramilitary actions in Turkey, largely focusing on government personnel located in the Kurdish region of southeastern Turkey. They created the Kurdish National Liberation Front (ERNK), as well as the Kurdistan Popular Liberation Army (ARGK), as armed wings of the PKK. In 1986 and 1987 Turkey crossed the border on multiple occasions to target PKK targets within Iraq. This interaction, with the PKK launching numerous small attacks in southeastern Turkey, with occasional large retaliatory strikes by the Turkish military at PKK targets in Iraq, continued through the 1990s, and to some degree to the present, with Turkey remaining involved in northern Iraq for many years, as well as operating in Kurdish areas of Syria.

UCDP data on the number of battle deaths is available starting in 1989. Figure 2.5 shows both the size of the PKK and the government forces, as well as the number of battle deaths that were inflicted on both sides for each year of the conflict. In 1989 the PKK had reached a level of 5000 fighters. They had been steadily recovering from the losses suffered in 1980, and troop levels continued to increase over the next several years, to a peak of 13,500 in 1998.

At the beginning of the period, in 1989, there were only 227 battle deaths attributed to fighting between the government and the PKK. This level in-

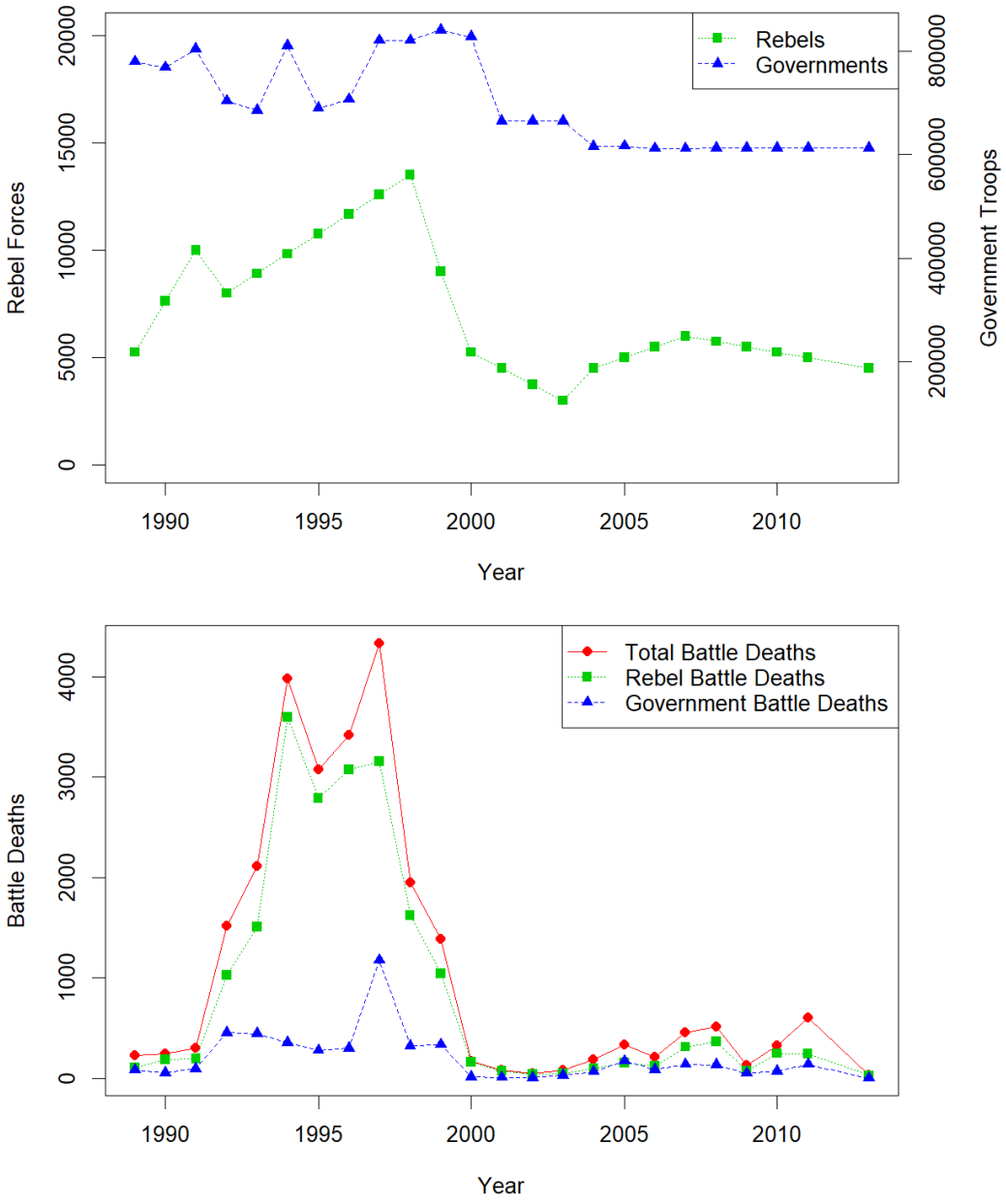

Figure 2.5: Troops Levels and Battle Deaths for the PKK and the Government of Turkey

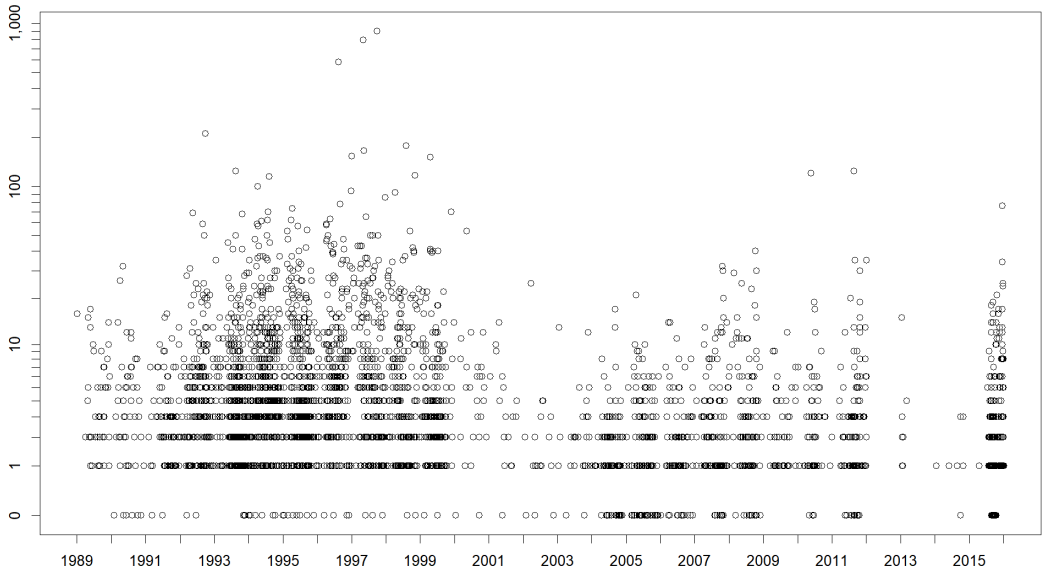

Figure 2.6: All PKK-Turkey Conflict Events by Time and Size

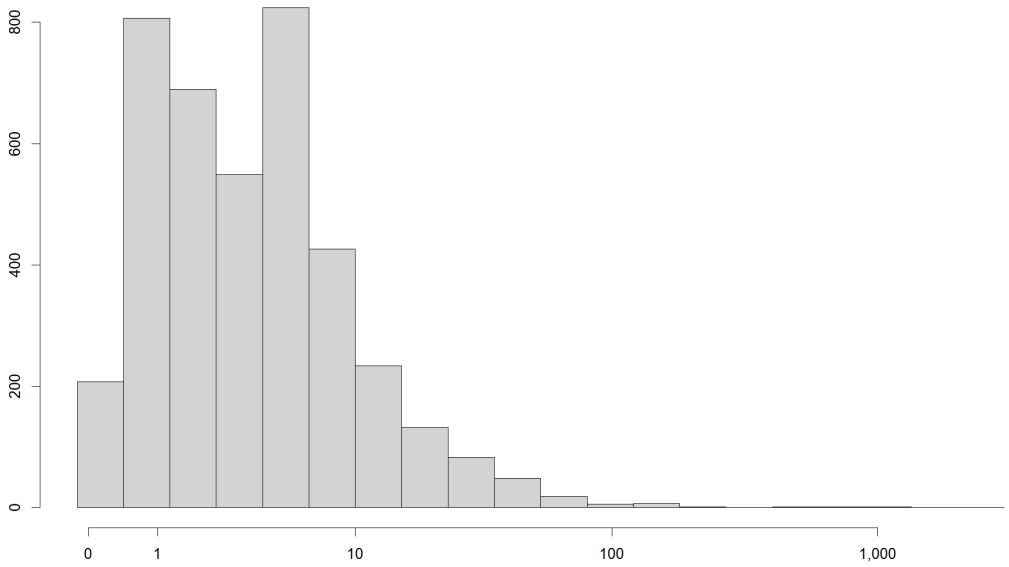

Figure 2.7: Histogram of Conflict Event Size

creased slowly over the next two years, with 245 and 304 battle deaths in 1990 and 1991. This gradual increase goes along with the steady increase in the size of the PKK.

Beginning in 1992 the intensity of the conflict began to increase dramatically. The increased size of the PKK had allowed them to launch increasingly large attacks against government targets. Figure 2.6 shows the magnitude of all conflict events, as well as when they occurred. It shows that in 1992 both the density of events over time increases, along with the size of the events, with many events killing more that 10 people and one over 100. The increase in intensity over the previous years drove the Turkish government to launch increasingly large operations to disrupt the PKK's growing capabilities. Turkey launched attacks against PKK targets along the border with Iraq, and crossed over into Iraq, for the first time since 1987.

Figure 2.5 shows that the increased battle deaths were primarily dealt to the PKK. In previous years the losses from conflict had been more evenly distributed, however the period of increased conflict intensity that began in 1992 and lasted until 1999 sees the PKK taking much larger losses than the government, due to the increased government effort to target PKK bases and degrade their capabilities. Despite the increased number of deaths sustained by the PKK, averaging about 3000 per year from 1994 to 1997, the group continued to grow, with a net increase of about 1000 troops per year, until reaching their peak size in 1998, at 13,500 fighters.

During this period, when the government was increasingly targeting the

PKK, and threatening their ability to continue large-scale operations, the PKK altered their tactics. Originally the PKK primarily targeted government security forces, as well as local officials and individuals who opposed their goal of an independent Kurdish state. In the 1990's they broadened their targets to include tourist locations, in an attempt to harm the tourism economy. These targets were limited to Turkey, with the exception of when, in 1993 and again in 1995, the PKK launched attacks on Turkish targets in 11 countries in Europe, the Middle East, and Africa. Spreading their attention from purely governmental targets to softer targets coincides with the government degrading the capability of the PKK to organize sophisticated attacks against hard targets.

In 1995 Turkey launched Operation Steel, which saw 35,000 Turkish troops enter Iraq to destroy PKK bases there. The Turkish government claimed to kill 555 Kurdish militants while losing 61 of their own soldiers. Turkey estimated that after their operation there were still about 10,000 PKK soldiers in northern Iraq.

Following Operation Steel, when many PKK fighters were killed by the Turkish government, the PKK launched its first suicide attack, in 1996. This marked another change in their tactics, as a result of the dynamic relationship between the rebels forces and the government. On June 30th a PKK suicide bomber detonated a suicide bomb at a military parade in a Kurdish-populated city in eastern Turkey, killing 10 people. This marked the first of 11 suicide attacks between 1996 and 1999. The PKK did not use suicide bombs again

until 2007, and then not again until 2012. Since 2012 there have been eight further suicide attacks. All of the PKK suicide bombings have targeted military forces, and the total number of deaths from suicide bombings is only 77, which is a small percentage of the 26,649 battle deaths recorded since 1989.

The introduction of suicide tactics corresponds to the maximum of the PKK's size, and to the peak level of conflict intensity. As the government was launching large-scale attacks on PKK bases in Iraq, in order to degrade the PKK's capabilities, the PKK began adding suicide attacks to their repertoire. This is an indication that the size of the PKK, which had been growing steadily for years, drew increased attention from the government, which in turn increased the conflict intensity. The increased intensity put pressure on the PKK to find alternative methods of confronting the government.

In 1997 Turkey launched Operation Hammer in May, followed by Operation Dawn in September. Both of these operations were Turkish attempts to destroy PKK forces within northern Iraq. Although Turkey claimed to kill thousands of PKK fighters in these operations, while losing hundreds of their own soldiers, it is most likely that in total 3,160 PKK fighters were killed in 1997, while 1,177 government soldiers died. Almost half of those deaths occurred in northern Iraq, with the remainder scattered throughout southeastern Turkey.

Most of the conflict events between the PKK and the Government of Turkey are relatively small. Figure 2.7 shows the distribution of conflict events by number of battle deaths. Half of all conflict events caused 3 or fewer battle

deaths, and the mean event resulted in 6.6 deaths. 98% of these events occurred in Turkey, with the remainder in Iraq. The PKK was using northern Iraq as a safe haven from which to launch attacks in Turkey. These attacks were numerous, but each individual event was relatively small. The events in Iraq were the result of the Turkish Government crossing the border to launch large operations against PKK bases, with the goal of wiping the organization out with overwhelming and concentrated force. The average conflict event in Iraq was considerably larger than those in Turkey, with a mean of 53.6 deaths, and includes most of the conflict events that killed more than 100 people. The largest single events in the data are in northern Iraq, in May and September of 1997, and killed 791 and 897 people respectively. These events correspond to the Turkish operations Dawn and Hammer.

A major turning point in the conflict occurred in October of 1998, when Turkey succeeded in pressuring Syria to expel Abdullah Öcalan. The increased violence over the previous four years caused Turkey to decided that capturing Öcalan was important enough to threaten war with Syria, and the Turkish government went as far as mobilizing troops in preparation for an invasion of Syria in order to coerce the Syrians into ending their protection of Öcalan. Syria forced Öcalan to leave, and after failing to receive asylum in Greece, Russia, and Italy, he eventually ended up in Nairobi, Kenya, where he was abducted by the Turkish intelligence service, and returned to Turkey for trial. In early 1999 he was tried and sentenced to death, which was commuted to life in prison. Later that year Öcalan announced a peace initiative, and told

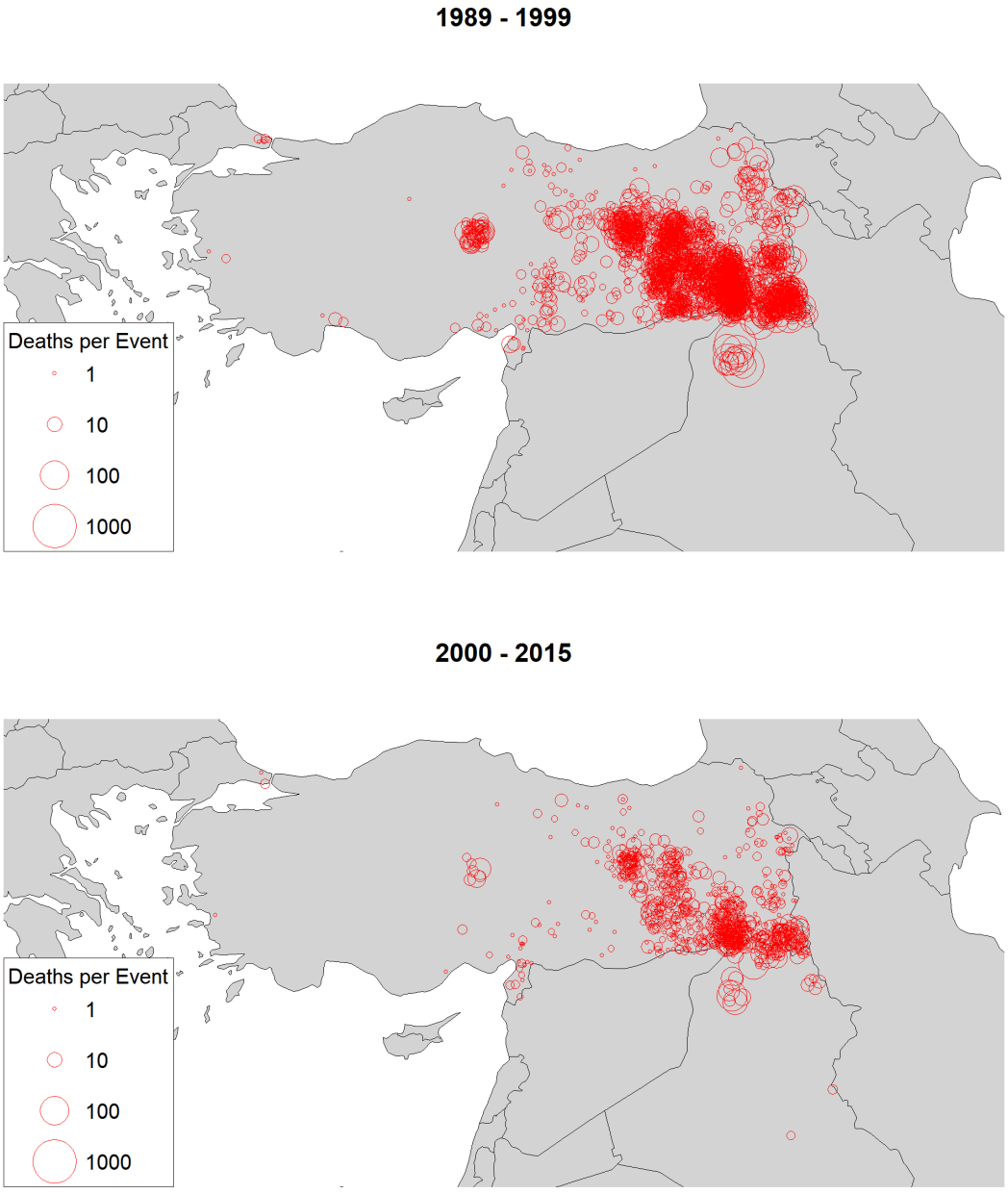

Figure 2.8: Location and Size of Conflict Events Between the PKK and the Government of Turkey from 1989 Through 2015

the PKK to refrain from using violence. In January, 2000, the PKK accepted Öcalan's initiative and announce they will only use political means to achieve their goals.

The combination of intensive Turkish military operations against PKK forces and the capture of Öcalan caused a drastic decline in both the capabilities of the PKK, and in the intensity of the conflict. 1997 marked the highest intensity year of the conflict, with 4,337 battle deaths. Many of these deaths were related to government operations to destroy PKK bases in Iraq, and the government decision to increase their use of force appears to have worked, as following Operation Dawn, the level of violence dropped precipitously. The next year, 1998, saw only 1,952 deaths, followed by 1,390 the next year. By 2000 the fighting had reached its lowest level since the 1980s, with only 174 battle deaths. This drop in intensity corresponds to a dramatic decline in the number of fighters the PKK commanded. Troop size reached its maximum, of 13,500, in 1998, and then dropped to 9,000 in 1999, and further fell to 5,250 fighters in 2000. This decline began the year after conflict intensity reached its peak, and at approximately the same time that Öcalan was captured. In turn, the decline in the number of PKK fighters caused an even steeper decline in the number of battle deaths.

Following their decline from 1998 to 2000, and the ceasefire that was announced that year, the PKK renamed themselves the Kurdistan Freedom and Democracy Congress (Kongreya Azadi u Demokrasiya Kurdistan, or KADEK). In late 2003 they renamed themselves again, as the Peoples Congress of Kur-

distan (Kongra-Gel, or KGK). They reasserted their refutation of violence, although they continued to fight while claiming their actions were in self-defense. In June 2004 the militant wing, the People's Defense Force (HPG) renounced the self-imposed cease-fire that had been in place, at least nominally, for four years. In 2005 the organization reverted to their original name.

During the 2000-2004 ceasefire, battle deaths remained at a very low level, averaging about 100 deaths per year. The number of PKK soldiers also continued to decline, falling to a minimum of 3000 in 2003. Following the resumption of fighting, the number of fighters in the PKK began to grow, as did the number of battle deaths. Over the next four years the number of soldiers in the PKK doubled, and the number of battle deaths increased to 5 times their 2003 level.

Fighting between the PKK and the Turkish Government continued for several more years at similar levels, despite peace talks between the two sides from 2009 and 2011. The PKK declared another ceasefire in 2013, which reduced the level of fighting, but only until that ceasefire ended in 2015. It was followed by a new spike in conflict, with 903 battle deaths in 2015.

The PKK serves as an illustration of how variation in the size of a rebel group determines the tactics they use, which in turn affects the response of the government, and how these effects combine to determine the overall intensity of the conflict. The PKK began as a small organization that limited its actions to small attacks on soft targets. In the 1990s they grew into a large force that fought a high intensity war which killed thousands of people

per year. A strong government response weakened the PKK, forcing them to reduce, and occasionally suspend, their activities, resulting in a drastic decline in intensity since 1999. This illustration demonstrates how the theory of the tactical interactions between rebels and governments determines conflict intensity, and serves as a more detailed example to compliment the cross-case statistical analysis.

2.6 Conclusion

The strategic interactions between rebels and governments produce an asymmetric result on conflict intensity. Increased rebel capabilities greatly increase conflict intensity, while higher levels of government capabilities have a slight negative effect on intensity. Capabilities themselves allow actors to kill more of their opponents, however capabilities in turn affect the tactics that actors choose to employ. Powerful rebels are not only able to generate more force, but are also able to come out of the shadows of insurgency and put their strength to use in more direct attacks against government forces. Governments must respond to increased rebel activity by increasing their own efforts to counter the rebels. I argue that the combination of increased capabilities and increasingly direct combat by both actors drastically increases the number of combat deaths generated in a conflict. Conversely, when the government increases in power the increased lethality of the army is tempered by an increase in rebel reliance on concealment and guerrilla tactics, resulting in a small deterrent

effect on intensity.

Conflict intensity is a fundamental aspect of conflict, and requires more attention from academic researchers. Conflict onset and termination are defined by the number of deaths that occur in the first and last year of a conflict, and duration is defined as the number of years between these two points. Using intensity to only indicate when a conflict begins and ends, and ignoring the level of intensity between these two events, risks missing important elements of conflict. Many studies do not differentiate between small and large conflicts, despite the fact that conflicts with 25 annual battle deaths bear little resemblance to those that kill tens of thousands. Existing research on conflict duration and conflict termination do not account for the effect of intensity, despite the fact that duration is defined as the amount of time that intensity remains above the battle death threshold, and termination occurs at the point in time when intensity drops sufficiently to fall below that threshold. In order to fully understand how wars drop from high levels of intensity to zero, it is necessary to have a better understanding of why intensity varies during conflicts. A full explanation of how wars end must explain how they are fought.

The focus on conflict onset, duration, and termination is justified by the interest in crafting policies that will prevent future wars and end current ones, however without a full understanding of how actors behave within wars it is difficult to fully understand how to end them. This paper adds to the understanding of how the balance of power within a conflict affects the strategic

decisions of actors within wars. Rebels and government forces respond to their military advantages and disadvantages by altering how they wage war. Understanding how actors make strategic decisions about how to fight will aid in understanding how actors decide to stop fighting as well.

The results demonstrate that the capabilities of rebel groups and governments have a dramatic effect on the number of battle deaths, and that the number of battle deaths in conflicts varies considerably. The amount of variation in conflict intensity is an important consideration for future academic studies of civil conflict. Much of the research on civil war does not address the intensity of conflicts, or the capabilities of the actors, missing important differences between very intense wars and small insurgencies. The improved understanding of the relationship between capabilities and intensity demonstrated in this paper provides insights that will improve future work on conflict duration and other studies of conflict dynamics.

Understanding how the balance of capabilities affects the intensity of conflict has important policy implications. Questions of conflict management must incorporate an understanding of the determinants of conflict intensity before they can attempt to alleviate the harm war inflicts on society. Intense conflicts kill many combatants, as well as civilians, and can devastate the economy and larger society of a country. Improving policymakers' understanding of the effect of capabilities on tactics and intensity will, hopefully, help them to make better decisions. The findings of this paper indicate that efforts to reduce the amount of violence in civil wars should focus on the capabilities

of the rebels. Interventions which restrict the capabilities of the rebels while increasing the capabilities of the government should have the largest effect on reducing intensity.

The theory and findings from this paper provide the baseline for research, described in the following two papers, examining the effect of external support on actor capabilities and conflict intensity, and the effect of conflict intensity on conflict duration. These papers improve on the understanding of the effect of capabilities on intensity shown here, and connect the dynamics within a conflict to the important policy issues relating to the effects of foreign intervention into civil conflicts as well as addressing how managing conflict intensity can shorten ongoing civil wars.

2.7 Appendix

This section presents information on robustness checks including non-hierarchical models replicating the models presented in the main analysis, as well as models including lagged battle deaths, and models using ordinary least squares instead of negative binomial regressions. Additionally, there is a discussion and empirical analysis of the relationship between battle deaths and civilian deaths, and additional maps of the conflict between the PKK and the government of Turkey, displaying the location and size of conflict events on a yearly basis.

2.7.1 Non-Hierarchical Model

Table 2.3 repeats the results discussed in Table 2.2, without including random intercepts by dyad. The results are largely consistent with the results in the main analysis, although when not allowing the intercepts to vary, the effect of government troops increases in significance, reaching the 0.1 level. Although still marginally significant, this provides increased confidence that large government armies may have a slight negative effect on conflict intensity, as larger armies can deter rebels.

Table 2.3: Negative Binomial Regressions of Capabilities on Battle Deaths

	Dependent variable:		
	Battle Deaths		
	(4)	(5)	(6)
ln(Gov Troops)	-0.105^{*}	-0.118^{*}	1.956
	(0.060)	(0.060)	(3.080)
ln(Gov Troops)^2			-0.162
			(0.268)
ln(Gov Troops)^3			0.004
			(0.008)
ln(Reb Troops)	0.701^{***}	-0.972	-1.059
	(0.032)	(1.480)	(1.484)
ln(Reb Troops)^2		0.187	0.201
		(0.192)	(0.193)
ln(Reb Troops)^3		-0.007	-0.007
		(0.008)	(0.008)
Polity	-0.002	-0.005	-0.003
	(0.009)	(0.010)	(0.010)
ln(Population)	-0.027	-0.011	0.014
	(0.063)	(0.063)	(0.066)
ln(GDP/capita)	0.060	0.074	0.074
	(0.047)	(0.047)	(0.049)
Constant	1.654^{*}	6.180^{*}	-2.651
	(0.844)	(3.733)	(12.018)
Observations	942	942	942
Log Likelihood	$-6{,}342.687$	$-6{,}339.879$	$-6{,}338.955$
θ	0.604^{***} (0.024)	0.607^{***} (0.024)	0.607^{***} (0.024)
Akaike Inf. Crit.	12,697.370	12,695.760	12,697.910
Note:			*p<0.1; **p<0.05; ***p<0.01

2.7.2 Lagged Battle Deaths

The number of soldiers in the rebel and government armies are affected by the number of battle deaths in a conflict, introducing the possibility of endogeneity. To control for the possibility that deaths in combat one year are determining the number of troops available to fight in the next year, I reran all models with a lagged variable for the number of battle deaths in the conflict. The results for non-hierarchical models are shown in Table 2.4, and hierarchical models are shown in Table 2.5. The number of deaths in the previous year is a strong indicator of the amount of deaths to be expected in the current year. The results for the remaining variables are similar to those in the main analysis, indicating that the effect of battle deaths on troops levels are not driving the results.

Figure 2.9 graphs the predicted counts of battle deaths for conflicts at all levels of rebel and government troops, for models with and without lagged battle deaths, as reported in the tables below. All three graphs showing the effect of rebel troops on battle deaths look very similar to the results shown in Figure 2.3, in the main text. For government forces the only noticeable difference is an increased significant for the lagged battle deaths, without random intercepts. The effect of government troops on battle deaths is not significant for the other models.

Table 2.4: Negative Binomial Controlling for Previous Year's Battle Deaths

	Dependent variable:		
	Battle Deaths		
	(7)	(8)	(9)
ln(Gov Troops)	-0.226^{***}	-0.234^{***}	6.927^{**}
	(0.056)	(0.056)	(2.858)
ln(Gov Troops)^2			-0.618^{**}
			(0.249)
ln(Gov Troops)^3			0.018^{**}
			(0.007)
ln(Reb Troops)	0.493^{***}	-1.716	-1.824
	(0.031)	(1.392)	(1.394)
ln(Reb Troops)^2		0.295	0.308^{*}
		(0.181)	(0.182)
ln(Reb Troops)^3		-0.013	-0.013^{*}
		(0.008)	(0.008)
Polity	-0.028^{***}	-0.032^{***}	-0.033^{***}
	(0.009)	(0.009)	(0.009)
ln(Population)	0.106^{*}	0.119^{**}	0.109^{*}
	(0.058)	(0.059)	(0.061)
ln(GDP/capita)	0.107^{**}	0.113^{**}	0.127^{***}
	(0.044)	(0.044)	(0.045)
Lagged Deaths	0.001^{***}	0.001^{***}	0.001^{***}
	(0.00003)	(0.00003)	(0.00003)
Constant	1.723^{**}	6.903^{**}	-19.970^{*}
	(0.783)	(3.493)	(11.136)
Observations	942	942	942
Log Likelihood	$-6,248.053$	$-6,246.644$	$-6,243.799$
θ	0.703^{***} (0.029)	0.705^{***} (0.029)	0.708^{***} (0.029)
Akaike Inf. Crit.	12,510.110	12,511.290	12,509.600
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 2.5: Controlling for Previous Year's Battle Deaths, with Random Intercepts

	Dependent variable:		
	Battle Deaths		
	(10)	(11)	(12)
ln(Gov Troops)	−0.056	−0.051	−0.022
	(0.077)	(0.077)	(1.145)
ln(Gov Troops)^2			0.019
			(0.093)
ln(Gov Troops)^3			−0.001
			(0.003)
ln(Reb Troops)	0.518***	−2.296	−2.352***
	(0.041)	(1.730)	(0.588)
ln(Reb Troops)^2		0.345	0.357***
		(0.231)	(0.074)
ln(Reb Troops)^3		−0.014	−0.014***
		(0.010)	(0.003)
Polity	−0.016	−0.018	−0.011
	(0.013)	(0.013)	(0.013)
ln(Population)	−0.033	−0.031	0.0001
	(0.085)	(0.085)	(0.090)
ln(GDP/capita)	−0.110	−0.118*	−0.119*
	(0.069)	(0.069)	(0.068)
Lagged Deaths	0.0002***	0.0002***	0.0002***
	(0.00004)	(0.00004)	(0.00004)
Constant	3.075***	10.392**	9.028*
	(1.140)	(4.359)	(4.799)
Observations	942	942	942
Log Likelihood	−6,104.541	−6,102.142	−6,101.655
Akaike Inf. Crit.	12,227.080	12,226.280	12,229.310
Bayesian Inf. Crit.	12,270.710	12,279.610	12,292.330
Note:			*p<0.1; **p<0.05; ***p<0.01

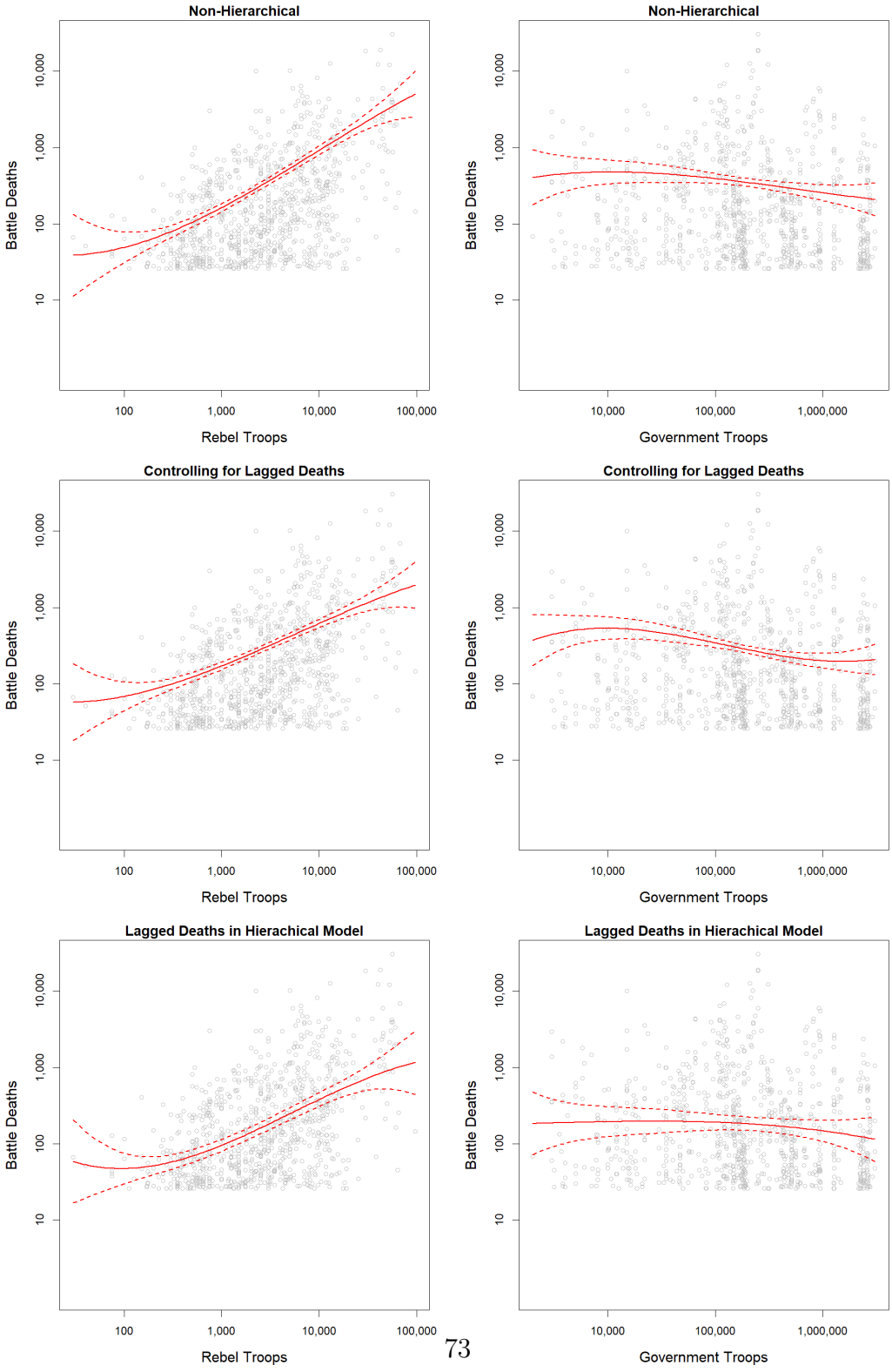

Figure 2.9: Predicted Battle Deaths for Alternative Models

2.7.3 Ordinary Least Squares Analysis

Table 2.6 repeats the analysis shown in Table 2.2, using ordinary least squares regression on a logged dependent variable instead of the negative binomial regression shown in the body of the paper. The regression results are largely similar, with all polynomial terms being significant. The primary difference between the negative binomial and OLS models is that the polynomial for government troops is significant in the OLS results shown in Table 6. Figure 2.10 shows the predicted battle deaths for all levels of government troops, and the significant result appears to stem from moderately high government armies, around 200,000 troops, having lower estimates than smaller armies.

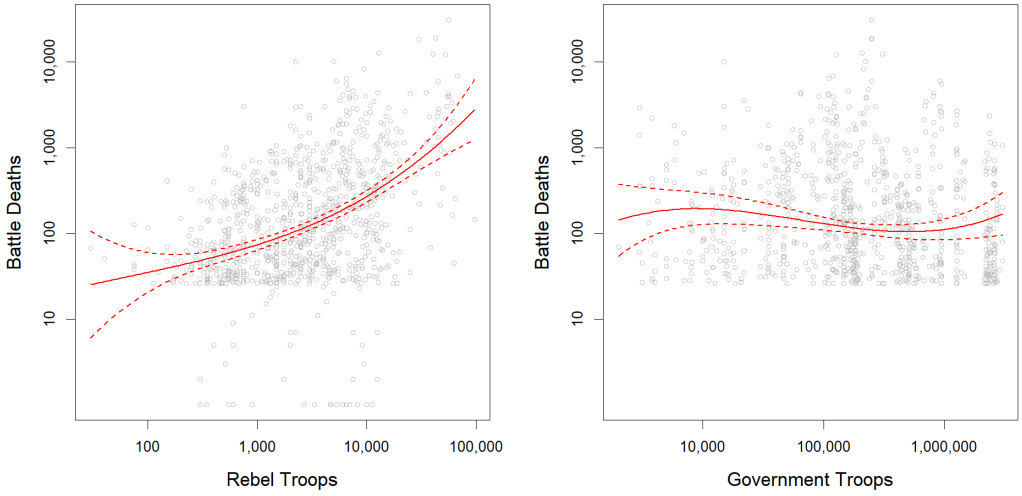

Figure 2.10: Predicted Battle Deaths Using Ordinary Least Squares

Table 2.6: OLS Regressions of Capabilities on Logged Battle Deaths

	Dependent variable:		
	Logged Battle Deaths		
	(13)	(14)	(15)
ln(Gov Troops)	-0.138^{*}	-0.111	6.726^{*}
	(0.070)	(0.071)	(3.594)
ln(Gov Troops)2			-0.626^{**}
			(0.313)
ln(Gov Troops)3			0.019^{**}
			(0.009)
ln(Reb Troops)	0.547^{***}	0.854	0.658
	(0.037)	(1.727)	(1.727)
ln(Reb Troops)2		-0.114	-0.090
		(0.224)	(0.224)
ln(Reb Troops)3		0.008	0.007
		(0.010)	(0.010)
Polity	0.021^{*}	0.023^{**}	0.016
	(0.011)	(0.011)	(0.011)
ln(Population)	0.021	0.002	-0.043
	(0.074)	(0.074)	(0.077)
ln(GDP/capita)	0.063	0.049	0.084
	(0.055)	(0.055)	(0.057)
Constant	1.403	2.189	-21.196
	(0.990)	(4.353)	(14.019)
Observations	942	942	942
R^2	0.195	0.205	0.211
Adjusted R^2	0.191	0.199	0.204
Residual Std. Error	1.512 (df = 936)	1.504 (df = 934)	1.499 (df = 932)
F Statistic	45.310^{***} (df = 5; 936)	34.370^{***} (df = 7; 934)	27.719^{***} (df = 9; 932)
Note:			*p<0.1; **p<0.05; ***p<0.01

2.7.4 Relationship Between Battle Deaths and Civilian Deaths

This paper focuses on the dyadic relationship between governments and rebels groups, using battle deaths as the primary metric for conflict intensity. To relate battle deaths to deaths of civilians who are purposefully targeted by actors in a civil conflict, it is necessary to expand the analysis to the country level, as massacres of civilians are recorded by UCDP based on the actor who carries out the killing, but not the dyad that that actor is part of. In cases where there are multiple dyads within a single country it would be impossible, based on the existing data, to attribute civilians killed by the government to a particular dyadic conflict. To evaluate the relationship between battle deaths and deaths of civilians I aggregate all deaths within each country, and analyze them at the country-year level.

A linear regression of civilian deaths on battle deaths shows that for every one percentage point increase in logged battle deaths there is an increase of 0.39 percentage points for logged civilian deaths. This indicates that although there is a positive and significant relationship between these two variables, as conflicts become more intense, in the sense of increased fighting between the fighters on both sides of the conflict, there is a lower tendency for civilians to be targeted directly. Figure 2.11 shows the predictions from this regression. Small conflicts have, on average, roughly similar levels of deaths from targeted civilian killings and from battle deaths. Larger conflicts have more civilian deaths, but they make up a much smaller percentage, with conflicts that ex-

Table 2.7: OLS Regression of Civilian Deaths on Battle Deaths

	Dependent variable:
	Logged Civilian Deaths
Logged Battle Deaths	0.394***
	(0.022)
Constant	1.309***
	(0.106)
Observations	1,128
R^2	0.220
Adjusted R^2	0.219
Residual Std. Error	2.133 (df = 1126)
F Statistic	316.753*** (df = 1; 1126)
Note:	*p<0.1; **p<0.05; ***p<0.01

perience 10,000 battle deaths having on average about 100 civilian deaths.

If a total death toll that included both deaths of targeted civilians as well as deaths resulting from armed combat between rebel groups and governments, the increased number would not differentiate intense conflicts, in which the two armed groups are targeting each other, from low-intensity conflicts in which the government is targeting civilians because they cannot find the rebels, or the rebels are targeting civilians because they are too weak to target the government directly. Although this joint measure would be a better measure of human loss and suffering, it would be a poorer measure of the intensity of conflict between armed groups, which this paper is seeking to explain.

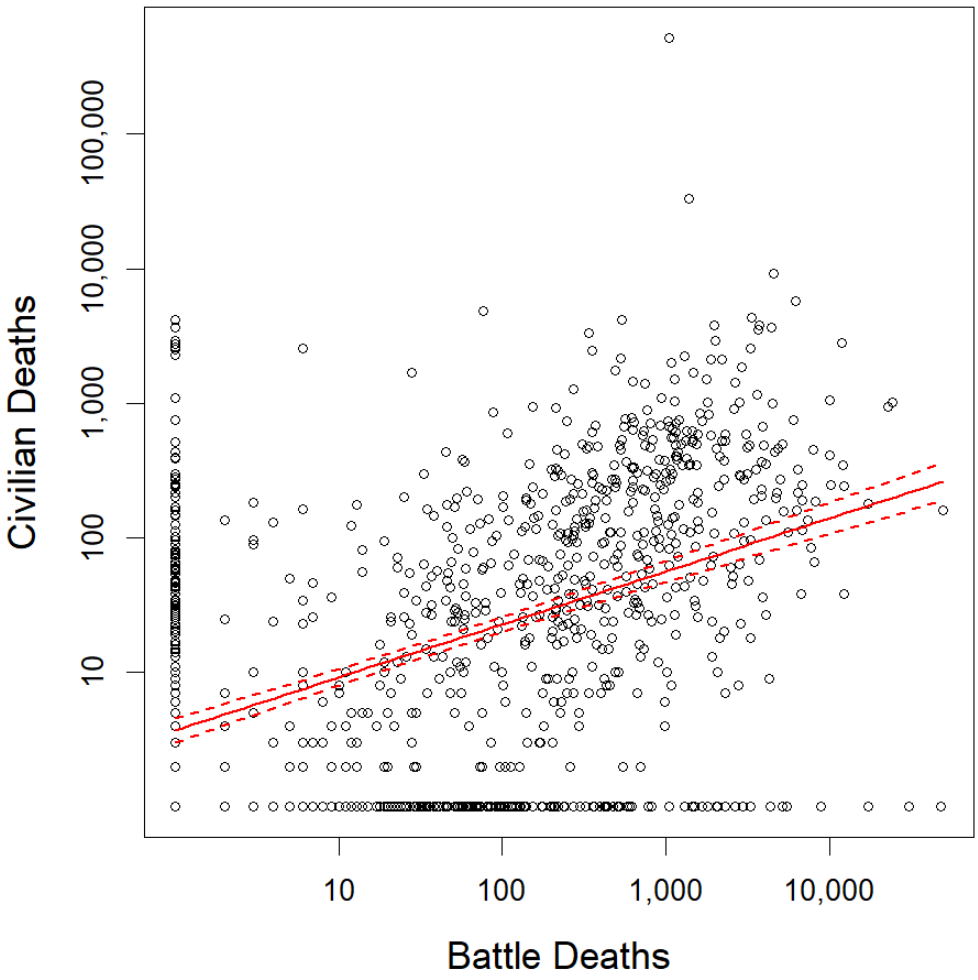

Figure 2.11: Relationship Between Battle Deaths and Intentional Killing of Civilians

2.7.5 Maps of Turkey-PKK Conflict Events

Figures 2.12 and 2.13 show the location and size of all conflict events involving the Government of Turkey and the PKK between 1989 and 2013. These maps provide a more detailed look at the dynamics of this conflict than the two maps in Figure 2.8. Over the first three years there is a gradual increase in the number of conflict events, which started in concentrated area of the southeast, near the Iraqi border. By 1993 the number of events had grown in number, and were covering all of southeastern Turkey. This high level of concentrated conflict continued for several years. In 1997 there are several very large events in northern Iraq, which represent major military operations by the Turkish military against PKK forces in Iraq. In 1998 and 1999 the number of conflict events can be seen to be smaller, and 1999 sees three more large conflict events in northern Iraq.

From 2000 onward the number of conflict events can be seen to be far smaller, and the individual events are of smaller magnitude. There are no conflict events in Iraq from 2001 to 2006. In 2010 and 2011 a few relatively large events can be seen in Iraq, after which the intensity drops, with no events in 2012, and only 8 small events in 2013.

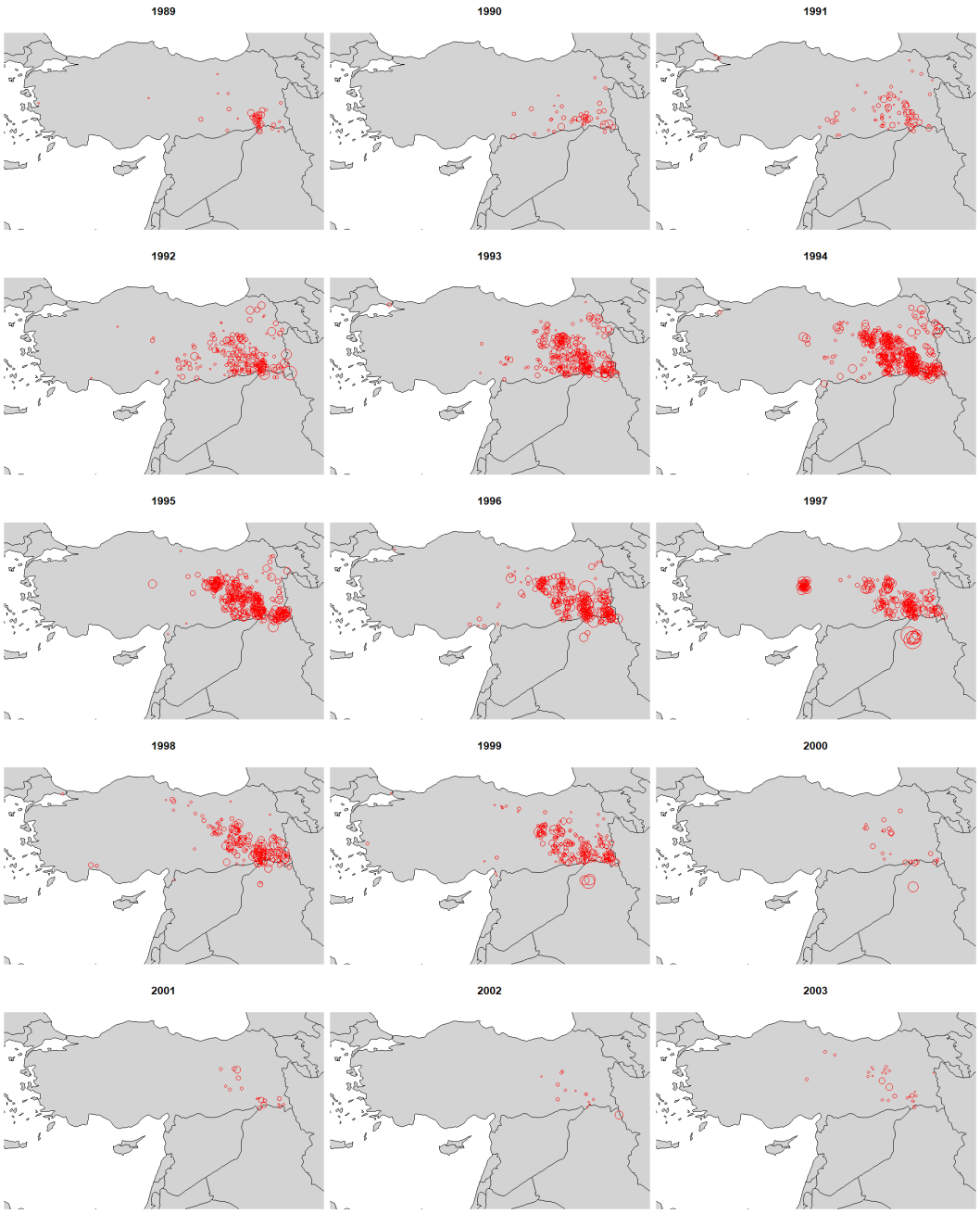

Figure 2.12: Location and Size of Conflict Events Between the PKK and the Government of Turkey from 1989 to 2003

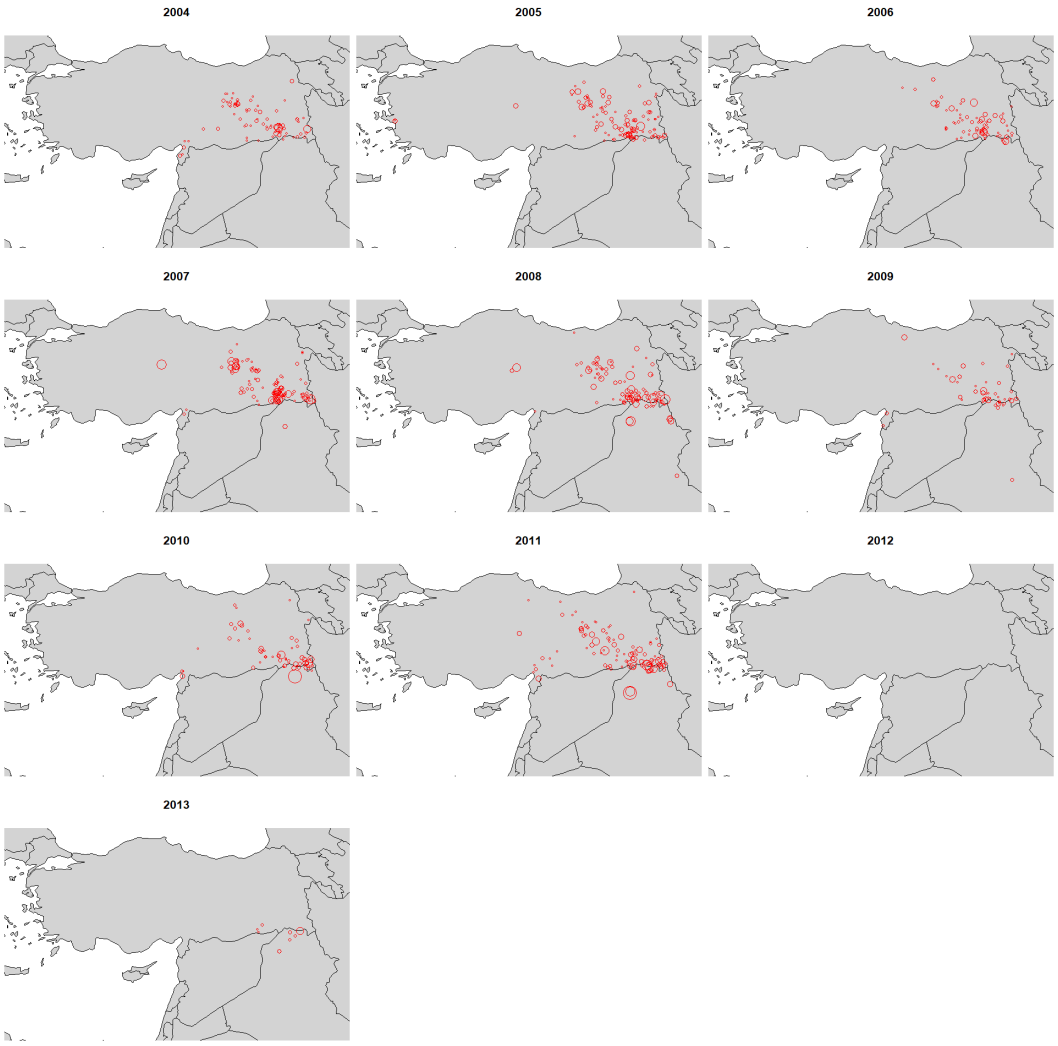

Figure 2.13: Location and Size of Conflict Events Between the PKK and the Government of Turkey from 2004 to 2013

Chapter 3

The Strategy of International Intervention: How Foreign Powers Increase Civil War Intensity

Abstract

This paper explores the dynamics of how foreign intervention affects conflict behavior. When foreign states intervene in civil conflicts by supporting one side or the other, they alter the behavior of the actors. The support given by external actors increases the capabilities of rebel groups and governments, and provides incentives for them to alter their behavior. Rebel groups in particular respond greatly to external support. Certain types of support, such as providing intelligence to rebel groups, can triple the number of battle deaths produced in a conflict. When the rebels are very capable, relative to the government, they will use conventional military tactics, leading to higher intensity. When external supporters give aid to rebels this both increases the ability of the rebels to fight and also alters the incentive the rebels have to demonstrate their effectiveness to their benefactor.

Civil wars often consist of a small band of poorly armed rebels fighting against a much stronger state military. The weakness of rebel forces encourages them to seek out foreign benefactors, who can drastically strengthen a rebel movement with an infusion of cash, weapons, and other assistance. External actors see these rebels as useful proxies, through which they can achieve their aims, without taking direct action. The support these foreign states provide allows rebels to confront the state more forcefully and frequently, increasing the intensity of combat. Additionally, rebel forces that receive external support are incentivized to demonstrate their effectiveness to their supporters by increasing the lethality of their attacks, resulting in a behavioral change.

Weak rebels engage the state using guerrilla tactics, while strong rebels form conventional armies. The choice of tactics is determined by the capabilities of the rebels, which is partially shaped by the assistance they receive from external actors. In Syria the government's army engages in conventional combat against rebel armies that are supplied by the United States and other outside states, resulting in tens of thousands of battle deaths per year. Conversely, the Patani insurgents in southern Thailand have received no foreign support in their decade long struggle, and their conflict only kills hundreds per year.

External support can alter the capabilities of the actors in a war. When foreign supporters help government forces the rebels are forced to retreat and avoid combat, reducing conflict intensity. When foreign forces support rebel armies the result is a sharp increase in conflict intensity, due to an increase in

both the capabilities of the rebels, as well as a change in their behavior. As the rebels gain strength they will be more powerful, and they will use their new strength more frequently, launching bolder attacks on government forces.

This theory is supported by empirical evidence. Civil conflicts from 1989 and 2009 have averaged 577 battle deaths per year. There is a high degree of variation however, which is partly explained by external support. In wars with no external support to either party the average death toll is 323 battle deaths per year. When the government receives support and the rebels do not the average drops to 271, however conflicts with support to the rebels and not to the government average 656 deaths per year. In cases with support to both the rebels and the government the average death toll rises to 1221 per year.

The effect of external support has been examined in the literature on conflict duration, with findings that foreign intervention usually increases the duration of conflicts. However, the existing research on the effect of support on conflict intensity is very limited. This paper, by improving the understanding of how outside actors can influence conflict dynamics, will add to both the conflict intensity literature, as well as providing a better understanding of how it is that external support affects conflict duration.

I proceed to discuss the literature on civil war intensity and external support. Then I develop a theory of how foreign support shapes the behavior of governments and rebel groups, which in turn determines conflict intensity. This theory is tested empirically using data from the Uppsala Conflict Data Program (UCDP).

3.1 Literature

The existing literature on the effect of external support on conflict intensity contains conflicting theoretical expectations and few empirical results. There is much more existing research on external support in the conflict duration literature, however without a good understanding of how support effects conflict dynamics, the understanding of its effect on duration is limited. This paper will improve on the understanding of how support affects conflict actors decisions, and therefore how a war is fought. This will provide an understanding that will then improve the study of how support affects other elements of conflict.

Foreign intervention into civil wars has been assumed to affect conflict intensity since the first quantitative studies of conflict intensity (Lacina and Gleditsch, 2005). However, it has not only been theorized that external support can increase conflict intensity, but also that it could reduce it, by changing the way rebels behave. Theories supporting an increase in intensity when foreign forces intervene in a civil conflict are based on the idea that the support will increase the capabilities of the actors, and the government and rebels will use their new capabilities to fight harder, resulting in more battle deaths (Lacina, 2006; Lacina, Gleditsch and Russett, 2006). A different line of reasoning states that in Cold War conflicts rebels who received external support adopted insurgent tactics, and that this change in tactics led to fewer battle deaths, as well as increased conflict duration (Kalyvas and Balcells, 2010; Balcells and Kalyvas, 2014). Due to data availability, these studies used the Cold

War as a proxy for external support, assuming that wars occurring during that time period would have more foreign intervention. In this paper I will improve on this literature by both providing a more detailed theoretical understanding of the effect of external support on conflict intensity, as well as testing the effect of support much more precisely, using detailed data on the type of support, and the actor receiving it, rather than simply the period of history in which a war took place.

A different sort of external support comes in the form of governments which hire private military companies to assist them in internal conflicts. Private military companies allow governments to quickly gain increased military capabilities, for a fee. Hiring these companies has been shown to increase conflict intensity, and reduce conflict duration (Petersohn, 2015; Akcinaroglu and Radziszewski, 2012). This scenario differs somewhat from regular external support, as the government in this case has a clear desire to increase their capabilities, and to use them against the rebels. This supports the theory that increased capabilities allow for the potential for increase intensity, but not that governments will necessarily use their capabilities.

Lootable resources provide another means by which rebels, and sometimes governments, can increase the funds available to them to make war. The literature on lootable resources results in mixed predictions. Lootable resources are sometimes expected to increase violence (Weinstein, 2007), and are also sometimes predicted to reduce violence (Wood, 2010). Rebel groups with access to valuable resources should have more resources available to them, which can

be converted into war fighting potential, however drug cultivation is thought to be a long term business that requires an absence of government, reducing the incentive for the rebels to end the war. Existing work supports this argument by finding that diamonds and oil increase intensity, however drug cultivation reduces intensity (Lujala, 2009). Income from lootable resources should increase capabilities, however it differs from external support in that local resources are controlled by the conflict actors themselves, whereas external support comes from a powerful actor who presumably wants to see the support they provide going to good use.

Different types of external support have been shown to have different effects on conflict. Types of support that increase uncertainty about the future capabilities of rebel groups, such as money and weapons which can be saved for future use, make it harder to end conflicts, and increase conflict duration (Sawyer, Cunningham and Reed, 2017). Although this study looked at conflict duration, it is likely that different types of support will have different effects on conflict intensity as well.

The effect of foreign intervention into civil conflicts has been studied largely as a function of its effect on conflict duration. Existing findings show that while interventions overall increase conflict duration, biased interventions are more effective at ending conflicts than neutral interventions (Regan, 2002). Other studies have found that support to rebels shortens conflicts, while support to governments make conflicts longer (Collier, Hoeffler and Soderbom, 2004; Balch-Lindsay and Enterline, 2000). In addition to the side that

is supported, the type of intervention has been addressed, with diplomatic interventions helping to end conflicts, while other forms of intervention make them longer (Regan and Aydin, 2006). In addition to the type of intervention, the intentions of the supporter also affect conflict duration. When foreign states intervene with an interest separate from that of the domestic actors, conflicts are made longer (Cunningham, 2010). In addition to direct support, the characteristics of neighboring states, such as the presence of refugees and the availability of bases in a neighboring state, also affect conflict duration (Salehyan, 2007).

In addition to the length of the fighting, research has also addressed the length of the peace after a conflict. It has been argued that outside interventions are useful to encourage actors to commit to the terms of a conflict settlement, increasing the amount of time between spells of conflict (Walter, 1997). Impartial UN peacekeeping operations have also been shown to increase the duration of peace (Doyle and Sambanis, 2000).

Separate from the effect of external support on duration, it has also been shown to affect other forms of behavior within conflict. When rebels receive support from foreign states their behavior is influenced by the interests of that state. In particular, when rebels receive support from democracies, and from states with strong human rights lobbies, those rebels have been shown to be less likely to abuse civilians, due to pressure from their sponsor (Salehyan, Siroky and Wood, 2014). This paper will build on this finding to show that when civil war actors receive support they change their behavior in order to

demonstrate that they are putting that support to good use, which increases conflict intensity.

3.2 Theory

Some rebel groups launch occasional attacks while hiding out of sight and avoiding capture, while other groups attempt to directly confront the state army in hopes of defeating them in combat. The strategic choice of how to fight is determined by the relative capabilities of the rebels and the government, as well as the intervention of outside actors. Foreign states that support actors in civil conflicts seek to change the outcome of the conflict, and in order to do so they provide incentives to actors to change their behavior.

When foreign states intervene in a conflict they are searching for actors whose interests overlap with their own. By supporting an actor with similar goals, they can increase that actor's capabilities and help them achieve those goals. Overlapping interests are not, however, identical interests, and in most cases the supporter will also want to alter the behavior of their chosen actor. This creates a principal-agent problem. The outside actor providing the support and the party to the conflict which is receiving it have similar interests, however the conflict actor has to bear the costs of fighting more directly than the external supporter. The principal will push their agent to fight harder, even if it means increasing intensity to a point where the agent begins taking casualties higher than what they would be willing to tolerate on their own.

The agent, however, also has an interest in meeting the expectations of their benefactor, in order to continue to receiving support in the future.

The capabilities of rebel groups has been shown to affect conflict intensity in Chapter 2. The tactical model of conflict intensity argues that rebels have a choice of how to fight in a civil war, and that their choice is based on the capabilities available to them. Weak rebel groups will choose to adopt guerrilla tactics that involve relatively few, and limited, military engagements with government forces. Stronger rebels will adopt conventional tactics, and fight against the government more frequently. Instead of carefully choosing the time and place to launch occasional attacks, they will instead fight on a regular basis and fight in a manner similar to that of the government army they are opposing.

In addition to the size of the rebel force, the size of the government forces also affects conflict intensity. As government forces grow in size, rebels will be more reluctant to engage in combat, and intensity will decrease. When large government armies seek to find and destroy small rebel groups the size of the government forces limits their effectiveness, as the military capabilities of the government cannot be brought to bear on a small rebel force that seeks to avoid direct combat. As such, large government forces combined with small rebels are expected to have very low levels of conflict intensity. As the rebel force grows, the level of intensity grows quickly, as the rebels become more bold, and the government has an increased ability to find and fight the rebels. In the extreme, when rebel armies approach the same size and capabilities of

the government we see the highest levels of intensity, as the rebels directly confront the government and attempt to seize control, while the government dedicates all the resources they have available to stopping the rebellion.

In addition to the effect of military capabilities on conflict intensity, as discussed in Chapter 2, the tactical choices of governments and rebels are further altered when outside groups become involved in a conflict. Both states and rebels make decisions regarding how they employ the capabilities they possess. In the absence of foreign intervention, conflict intensity is a function of the strength of the actors. When external groups support actors in a civil conflict they alter the strength of the actors, as well as changing the incentives the actors have to choose among tactical alternatives.

The changes in capabilities of actors within a civil conflict that result from external support fit easily into the tactical model of conflict intensity, with more rebel capabilities increasing conflict intensity. When external support increases the capabilities of one actor, they are then able to fight better, which directly contributes to conflict intensity. When the support increases rebel capabilities it allows those rebels to fight more effectively, and the increased frequency increases the visibility of the rebels, allowing increased government targeting of the rebel group.

External support is not however, as simple as just increasing the capabilities of the supported group. The group providing the external support has their own interests in a conflict, and therefore provides support in the hope that their efforts will lead to their preferred outcome. As such, the support

alters the capabilities of rebel groups and governments, but also affects their behavior through conditions imposed by the supporter, who wants to see the assistance and resources they provide going to activities that they see as productive. The dynamics of conflict are therefore determined by a combination of rebel strategy and government strategy, which is also influenced by the preferences and desires of the external supporter.

3.2.1 Rebel Strategy

Rebels want to use their limited forces in the most efficient way possible. They also want to increase the size and capabilities of their forces. When rebels are weak, using their forces efficiently means launching occasional attacks, when the circumstances are in their favor. When they grow in power they are able to challenge the government more frequently, increasing intensity.

Receiving external support can increase the capabilities of a rebel army. The support can help fill critical gaps in the rebels' fighting abilities by providing them with important supplies, training, or information. When rebels receive this aid, they are able to use it to increase the size and frequency of attacks. They are also incentivized to demonstrate to the supporter that the support is being put to good use.

An increase in rebel capabilities results in conflict intensity being increased, at an exponential rate. This represents the theory that strong rebels will be bolder in their own actions, and will provoke strong responses from the government.

3.2.2 Government Strategy

Governments facing rebellions have an interest in crushing the rebels, however they also have an interest in expending as few resources as possible in the process. Strong governments facing weak rebels experience less urgency in dealing with the relatively weak threat posed by the rebellion, and will not dedicate all of their resources to fighting. When the rebels are relatively strong compared to the government, the state will increase the amount of resources dedicated to the conflict.

Governments facing rebellions have an interest in destroying the rebels, but also face other internal and external security threats which demand a share of the governments resources. Governments also must balance their resources between military and non-military goals.

Strong governments possess the capacity to kill large numbers of people, however this effect is mitigated because their strength deters the rebels from engaging in direct fighting. The increase in government capabilities results in the rebels avoiding combat, and therefore in fewer engagements between strong states and weak rebels.

3.2.3 Interests of Interveners

The needs of rebels and governments are different, as are their strategies. This means that external states will intervene in different ways depending on whether they are supporting the government or the rebels. Support from one state to another is viewed with a higher degree of legitimacy than governments

supporting rebels, and therefore support going to governments is more likely to be formal and overt. States that support rebel groups often attempt to keep their involvement covert, or at least maintain plausible deniability. This is an additional reason that the type of support states give is different depending on which side of the conflict they are supporting.

External supporters intervene in conflicts because they have an interest in the conduct or outcome of the conflict. When a conflict within one state has an effect on other states it can draw attention from outside actors. This could be due to violence spilling over the border, such as international terrorism associated with rebel groups such as ISIS, or it could be illegal trade, such as FARC's involvement in the cocaine industry. In other cases ideological issues are prominent, such as Cold War support from the US or USSR for governments and rebel groups that espoused the correct ideology relative to the supporting state. When outside governments intervene in support of rebel groups it is usually in an effort to hurt the state that those rebels are fighting. States will look at internal rebellions in another state as an opportunity to inflict harm on their rival without paying the costs of direct conflict.

When an outside state has decided to intervene in a conflict in support of one side or the other, they seek to alter the way that the conflict is fought. Support for rebels seeks to either inflict costs on the government, or overthrow the government altogether. In both cases the supporting state would want to see an increase in conflict intensity following the provision of support. When they support a state they will want to see the government defeat the rebels.

Usually this will entail increased levels of violence, as this is a sign of a more capable government that is also actively pursuing a rebel force in an effort to defeat them. However, there may also be cases where support to a government could reduce battle deaths, as states have an interest in minimizing the level of conflict inside their borders. The effect of support to governments is therefore likely to be contingent on the context in which it is given.

The foreign supporter provides aid to actors in order to help that actor achieve victory, or to inflict harm on that actor's opponent. In either case, the supporter has an interest in seeing the actors increase the pace of combat, in order to defeat the enemy, or at least increase the cost of conflict for them. Because of this interest in seeing conflict intensity increase, the actor that receives the support will change their behavior, in order to increase the number of engagements with the enemy.

3.2.4 Actors' Responses to Support

From the point of view of the actor receiving the support, their are two effects. The first effect is on capabilities. The support itself should increase the capabilities of the actor. This should make rebels bolder, and allow them to increase the pace and scale of attacks. The second effect of external support on actors is behavioral. When an outside actor intervenes to support a party to a conflict their support comes with strings attached. The foreign state has an interest, and they will only provide support, and continue to provide it into the future, if the actor receiving the support acts to further that inter-

est. Rebels and governments that accept support from an outside party will therefore have to alter their behavior accordingly.

Governments and rebel groups respond to incentives from external supporters to fight against their enemies. Weak rebels are normally inclined to avoid direct combat, and instead rely on carefully planned guerrilla attacks. Because of their infrequent and limited nature, these attacks cause relatively few deaths. When an external actor decides to intervene in support of a rebel group they seek to increase the effectiveness of that group, and want to see results in the form of increased numbers of battle deaths.

Conflict actors, when undisturbed by outside pressure, will find an ideal level of conflict intensity based on the level of capabilities of the two sides. When a rebel group is given support from an outside actor, that actor will press them to fight harder than they would otherwise choose to, since the foreign supporter does not have to bear the cost of that fighting, but does benefit from the results of it. Rebels who wish to continue receiving support into the future will partially comply with the pressure they receive to increase their operations, in order to signal to their supporter that they are putting the resources they are being given to good use. In cases where foreign states cooperate with government forces, the foreign forces have an even larger role in determining the intensity of conflict, as they will have troops and advisors in the country, planning and executing operations along with the host state.

For example, a rebel group that receives financial support from a foreign government will be expected to put that money to use. If they were to save it

for the future, or if the money found its way into private bank accounts held by the group's leaders, the state providing the funds would likely not continue to support them. If however that rebel group used the money to increase their capabilities and to launch more attacks, they will be able to demonstrate their effectiveness to their foreign benefactor, and secure continuing support. This incentive to demonstrate effectiveness will drive groups to adopt increasingly aggressive tactics.

Hypothesis 4 *External support increases conflict intensity.*

External support has a larger effect on rebels than on governments. States have standing armies and an existing tax base with which to support their forces, reducing the importance of external support. External support is often crucial for rebels, who usually do not possess the resource generating capability of states. External support increases the resources available to a rebel group, increasing their capabilities.

Hypothesis 5 *External support to rebels increases conflict intensity more than external support to governments.*

The type of support provided is usually meant to improve the weakest aspect of the actor's war effort, such as providing cash to a poor group, or providing weapons to a poorly-armed actor. Support in the form of troops, cooperation, access to territory, weapons, materiel, money, training, and intelligence increases the capabilities of the supported actor, and thereby changes

the intensity of the conflict. These different types of support will, however, have different effects on different actors.

For governments that are receiving support, the largest effect results from large scale cooperation between the state and a foreign military. When an outside state intervenes on behalf of a government with their own troops, or by cooperating in such a way that the government being supported is integrated into the military or intelligence infrastructure of the external supporter, the government will increase their capabilities drastically. They will also be working with an outside actor that is motivated to prosecute the war aggressively, increasing the tempo of operations.

Other types of support, when given to governments, will have less effect. In general, states are already better armed, equipped, and funded than their rebel adversaries, so additional resources will have a limited effect. Governments also have their own bases, training facilities, and intelligence agencies. While external help can always improve the existing capabilities of the state, it is unlikely that the effect will be as drastic as when the external supporter becomes directly involved in cooperating with the state being supported.

Hypothesis 6 *Support in the form of troops and the integration of the host state into the military infrastructure of the supporting state, when given to governments, will increase conflict intensity.*

For rebels, the dynamics are very different. Because rebels are usually much weaker than the governments they are fighting, increasing their capabilities in a number of areas will greatly improve their ability to fight, and therefore

increase the intensity of the conflict. Rebels deal with their material weakness by adopting guerrilla tactics, which reduces the number of troops and weapons necessary, but puts an increased demand on intelligence and training. When a small numbers of fighters seek to efficiently exploit the weaknesses of a larger and stronger adversary, having well trained fighters and detailed intelligence about the enemy provides a large advantage. For this reason, rebels that receive intelligence and training support will fight more efficiently and increase conflict intensity the most. Financial support will increase the ability of a rebel group to recruit soldiers and build an effective organization, and will therefore also increase their ability to fight and increase intensity.

Hypothesis 7 *Support in the form of funding, training, and intelligence given to rebels will increase conflict intensity.*

In addition to the effect of external support on conflict intensity generally, the support given to actors should have a more direct effect on the number of deaths a supported actor will inflict on their opponents. An increase in capabilities of one actor should increase their ability to kill the enemy, increasing not only the overall level of intensity, but also the level of deaths suffered by the opposing side. Additionally, conflict is inherently interactive, and an increase in fighting initiated by one side should also lead to an increase in the response from their opponent. When actors receive external support, and as a result of pressure from their sponsor begin to fight increasingly aggressively, the number of battle deaths the supported actor suffers should increase faster than the number of battle deaths inflicted on the other side. This is the result

of the supported actor selecting into less desirable conflict events than they would otherwise choose to be involved in. Their increased efforts will increase the number of enemy soldiers they are able to kill, but will also reduce the effectiveness of their actions in terms of the ratio of their own losses to those of their enemy. Hence, as they fight harder and suffer more casualties, the number of casualties their enemy suffers will increase at a slower rate, increasing the ratio of own deaths to enemy deaths, and reducing the efficiency of conflict for that actor.

Hypothesis 8 *An increase in battle deaths for one actor will increase the ratio of their battle deaths to those of their opponent*

3.3 Data

The effect of external support on conflict intensity can be analyzed using data from the Uppsala Conflict Data Program (UCDP). UCDP defines armed conflict as the use of armed force, resulting in at least 25 battle deaths in a calendar year, involving the government of a state and an organized opposition group fighting over an incompatibility regarding government or territory (Wallensteen and Sollenberg, 2001). For this research the cases will be restricted to civil wars, and will exclude interstate wars as well as conflict between non-state groups.

The UCDP Georeferenced Event Data (GED) contains dates and locations for individual conflict events with global coverage, from 1989 through

2016 (Sundberg and Melander, 2013). The data is recorded at the dyadic level, with each observation representing an armed conflict between a state and a rebel group. For each conflict event GED estimates the number of battle deaths resulting from the event. The maximum temporal resolution of the GED data is the day, although many cases are coded less precisely. Because all independent variables are coded as yearly observations, the GED data is aggregated to the year. The number of deaths per year is highly skewed, with values ranging from 0 to 30,633[1]. Battle deaths are used as the dependent variable, and because it is highly skewed count data negative binomial regressions are used.

Table 3.1: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Battle Deaths	861	576.692	1,736.376	0	30,633
Gov Support	861	0.555	0.497	0	1
Reb Support	861	0.410	0.492	0	1
Gov Troops	861	508,737.900	747,084.600	2,000	3,047,000
ln(Gov Troops)	861	12.084	1.608	7.601	14.930
Rebel Troops	861	6,266.979	10,305.580	30	68,333
ln(Rebel Troops)	861	7.887	1.361	3.401	11.132
Polity	861	1.433	6.220	−9	10
Population	861	179,913,214.000	353,267,284.000	606,844	1,324,655,000
GDP/capita	861	2,982.548	5,607.837	161.834	33,126.300

[1]The UCDP Dyadic Battle-Related Deaths Dataset only includes years where the total number of deaths is greater than 25. By aggregating events found in the GED data, I include years with fewer than 25 deaths, as long as at least one year in the conflict crossed the 25 battle death threshold. Two observations are recorded as 0 battle deaths, for years when there was at least one conflict event, even though no battle deaths resulted. Including periods of very low intensity improves the data, and avoids censoring cases where the actors chose to avoid conflict, and conflating them with periods where the actors were not active.

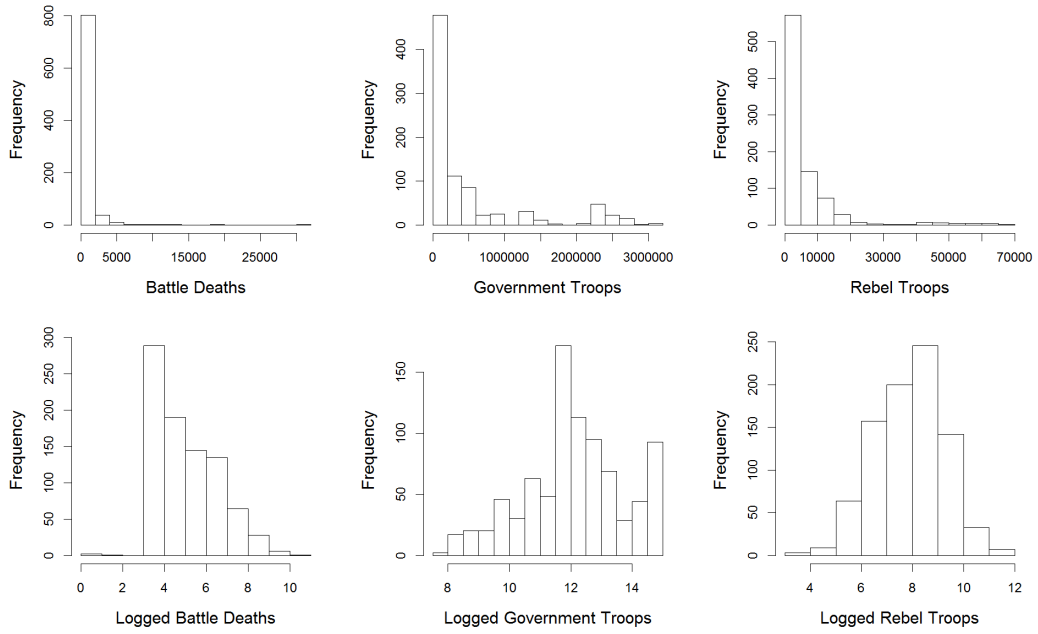

Figure 3.1: Distribution of Key Variables

3.3.1 Types of External Support

The UCDP External Support Dataset provides information on external support to actors in civil wars, for the years 1975-2009. The data includes details on the type of support given, distinguishing between troops, access to territory, access to joint infrastructure, weapons, materiel/logistics, training/expertise, funding, intelligence, and other or unknown support (Høgbladh, Pettersson and Themnér, 2011). I use this data to create two summary variables, one indicating whether the government received external support, and another indicating support to the rebels, as well as to create a series of indicator variables for the nine types of support, for both the government and the rebels. There is external support to the rebels in 41% of the observations, and external support to the government in 55%.

Troops as a secondary warring party refers specifically to combat troops from a foreign state military who are sent to fight alongside the troops of a government or rebel group involved in a civil conflict. Foreign soldiers who are provided for non-combat support fall under the appropriate category for the type of support they are providing.

Access to military or intelligence infrastructure indicates that the external supporter allows the party receiving support to use their military bases, intelligence gathering stations, or other facilities, as though the supported party were a part of the supporting state's forces. This category also includes alliances between rebel groups and coordinated efforts of two states who are both involved in a conflict with the same non-state actor. Examples of cooperation

of this sort include the United States supporting the government of the Philippines against the Communist Party of the Philippines (CCP) and against the Moro National Liberation Front (MNLF), and Moro Islamic Liberation Front (MILF), where the US provided the Philippines with access to US military facilities and resources, however they did not cooperate to the point of the US providing combat troops to fight alongside Philippine troops. An example of cooperation between rebel groups is the close relationship between the Kurdistan Worker's Party (PKK) and the Kurdistan Free Life Party (PJAK). The UCDP external support dataset considers both groups to be providing access to military and intelligence infrastructure to each other since the founding of PJAK in 2004. PJAK and the PKK share members of their leadership, and both claim allegiance to the imprisoned leader Abdullah Öcalan. The groups share the goal of increasing autonomy and self-government for the Kurdish people. They differ in that the PKK fights against the Turkish government and PJAK fights against the Iranian government.

Access to territory includes allowing the supported group to set bases on the territory of the supporter, or permitting the supported actor to use territory for sanctuary or cross-border raids. Both Syria and Iran are coded as having provided access to territory to Hezbollah from 1990 to 1995. The United States provided access to territory to two rebel groups, Jondollah and UNITA, and to a number of states, including Afghanistan, Colombia, Egypt, Iraq, and the Philippines.

Weapons support includes the provision of weapons and ammunition, in-

cluding donations and loans of weapons. Sales of weapons from one side to the other are only included if the terms of the sale are clearly preferential to the party receiving the arms, and this variable does not include commercial arms transactions between states.

Materiel or logistics support includes the provision of material goods that are directly applicable to military purposes, but do not include weapons and ammunition. This includes supplies such as vehicles, uniforms, tents, medical supplies, radars, and other equipment. It also includes assistance with logistics, such as transporting troops, and assistance with the repair and support of advanced weaponry, such as aircraft and tanks.

Training includes all training and instruction provided by an external supporter to an actor in a civil conflict. This training can occur within the country where the conflict is taking place, or in the territory of the country providing the support. Additionally, this variable includes expertise provided by the supporter in the form of advisers and other experts, as long as they are not involved in direct combat operations.

Funding support includes any type of economic aid that is provided to an actor that is engaged in an armed conflict. This includes loans and grants that are meant to improve the capabilities of the military. Support from the external supporter for the provision of loans from multilateral lenders such as the IMF and World Bank is also included. This variable does not, however, include humanitarian or development assistance, or balance of payments aid or loans.

Intelligence support includes the provision of intelligence materials, such as maps of enemy positions, cryptographic codes, satellite imagery, signals intelligence, information on troop capabilities, and information on the location of enemy leaders. Intelligence support only includes the provision of specific information, rather than the provision of intelligence capabilities. Cases where an external supporter provides an actor with access to intelligence gathering capabilities would be coded as access to military or intelligence infrastructure.

When external support is broken into its various subcomponents, there are many cases where support from an actor falls into multiple categories. Out of the observations in which rebels receive support, 65% of the cases involve multiple types of support. The most strongly related combination of support types is weapons and materiel. Additionally, weapons and materiel support are also correlated somewhat with training. Rebels who receive access to territory from an external supporter almost never receive troops or direct cooperation from other states, but are very likely to also receive a range of other types of support, such as training, funding, weapons, and intelligence support. The remaining combinations of support types have some correlation with each other, but at relatively low levels.

For support given to governments there is also a high degree of correlations between weapons and materiel, and those two types of support are also both highly correlated with training and funding. The combination of weapons, supplies, money, and the training to use all of them, appears to represent the typical type of support given from one state to another. Governments are very

rarely given access to territory in another state, and troops, direct cooperation, and intelligence are only loosely correlated with the other types of support.

Using ten types of support, and further dividing those variables by whether the support goes to the rebels or the government creates 20 variables, some of which have few observations. To simplify the situation, I also created dummy variables that grouped the ten variables into three categories. Three of the types of support represent cooperation between the supporter and the actor being supported. These categories are troops as a secondary warring party, access to territory, and access to military or intelligence infrastructure. In all three of these cases the supporter is cooperating with the actor they are supporting, rather than just providing them with assistance. The next grouping is material assistance given to an actor. This consists of a combination of the original variables for both weapons and materiel. Both of these variables represent goods provided to actors, and in 83% of the observations when one type of material support was given, the other was also provided. The third grouping is assistance given to the actor that is neither material, nor full cooperation. This includes financial assistance, training, intelligence, as well as the categories for other and unknown.

3.3.2 Actor Capabilities

The capabilities of armies are determined by a number of factors, however the most fundamental measure of the capability of an organization is the number of people fighting for that group. The capabilities of both governments and rebels

are measured using data compiled by Aronson and Huth (2017). This data includes the number of soldiers in government armies, as well as the number of fighters active in each rebel group, on a yearly basis. The distribution of the variables for rebel and government troop levels is shown in Figure 3.1. Because these variables are highly skewed, troop numbers are logged in the analysis.

The analysis covers the years 1989, when UCDP GED data starts, through 2009, which is the last year for which external support data is available. There are 208 unique dyads in the data, in 63 countries. Most dyads in the dataset consist of short conflicts. There are 83 dyads that only include a single year, and 147 dyads last less than 5 years. However, because of their short duration, these short conflicts only account for 263 of the 861 dyad-years in the dataset. Conversely, there are 13 dyads that last at least 15 years, accounting for 232 dyad-years. There is also a high degree of variation in intensity across dyads. There are 59 dyads that total less than 100 deaths over their entire duration, and 150 dyads have less than 1000. At the upper end there are several long, high intensity dyads. There are 11 dyads that total over 10,000 deaths, with the highest value being Sri Lanka and the Tamil Tigers, which totals 60,674 battle deaths over 19 years. The highest number of deaths in a single dyad-year is from the Government of Ethiopia fighting the Eritrean People's Liberation Front in 1990, with 30,633 battle deaths.

To control for cross-national effects which may influence both the number of battle deaths and the presence or absence of external support, control variables are included for regime type, population, and GDP per capita. Regime

type is included to address the possibility that autocratic regimes may kill more people in combat, and rebel groups in autocratic states may be more likely to attract external support from foreign states seeking regime change. Population has the potential to affect the number of people killed in combat, as larger countries provide the potential for larger rebel groups fighting over larger areas. Additionally, large states have a greater potential for multiple simultaneous conflicts, as well as attracting more international attention, and therefore intervention, due to their larger geopolitical importance. Per capita GDP indicates the standard of living of a country, as well as providing a measure of the resources available to the government. Rebellions in poorer states are likely to attract more fighters, who have fewer other options, and external support to these groups is likely to have a larger effect, as rebel groups in poorer states are likely to have fewer resources available to them without receiving foreign support.

Table 3.2: Average Battle Deaths by External Support Type

Support to Government	Support to Rebels		
	No	Yes	Total
No	323.1 (234)	655.7 (149)	452.5 (383)
Yes	270.7 (274)	1220.8 (204)	676.2 (478)
Total	294.8 (508)	982.3 (353)	576.7 (861)

A simple summary of the relationship between external support and conflict

intensity can be seen in Table 3.2, which shows the average number of battle deaths for all four combinations of external support. In cases where neither the government nor rebels receive external support the average number of battle deaths is 323.1 per year. When only the rebels receive external support that number more than doubles, to 655.7. Conversely, when only the government receives support the figure drops, to 270.7 battle deaths per year. The highest level of violence is observed when both sides receive foreign support, increasing intensity to 1220.8 battle deaths per year, nearly four times the level of conflicts without external support. These simple calculations will be elaborated upon below, however they illustrate that there is a high degree of variation between the types of conflict that include external support, and those that do not.

3.4 Analysis

This section tests my main theoretical claim that external support increases conflict intensity, with external support to rebels having a particularly large effect. Additionally, it investigates the combined effect of external support with existing capabilities of actors. First, a set of negative binomial regressions tests the effect of the presence of support to either the rebels or the government, as well as the effect of actor capabilities. Then the analysis continues to examine the effect of different types of support. Finally, the section ends with a series of robustness checks to ensure that the results are valid.

Table 3.3 presents four regression models using the indicator variables for

Table 3.3: Negative Binomial Regressions of Support on Battle Deaths

	Dependent variable:			
	Battle Deaths			
	(1)	(2)	(3)	(4)
Gov Support	0.135	0.131	0.054	1.148
	(0.094)	(0.097)	(0.085)	(0.632)
Reb Support	1.173^{***}	1.150^{***}	0.521^{***}	-1.787^{***}
	(0.095)	(0.096)	(0.085)	(0.496)
ln(Gov Troops)			−0.102	−0.075
			(0.059)	(0.067)
ln(Reb Troops)			0.633^{***}	0.513^{***}
			(0.031)	(0.041)
Gov Support*Gov Troops				−0.093
				(0.052)
Reb Support*Reb Troops				0.291^{***}
				(0.061)
Polity		-0.033^{***}	−0.012	−0.009
		(0.009)	(0.009)	(0.009)
ln(Population)		0.062	0.032	0.046
		(0.033)	(0.061)	(0.061)
ln(GDP/capita)		0.053	0.090^{*}	0.112^{*}
		(0.042)	(0.044)	(0.044)
Constant	5.622^{***}	4.209^{***}	0.680	0.835
	(0.079)	(0.716)	(0.799)	(0.846)
Observations	861	861	861	861
Log Likelihood	−6,036.670	−6,031.173	−5,868.898	−5,857.098
θ	0.534 (0.021)	0.539 (0.022)	0.706 (0.029)	0.720 (0.030)
Akaike Inf. Crit.	12,079.340	12,074.350	11,753.800	11,734.200
Note:				*p<0.05; **p<0.01; ***p<0.001

government support and rebel support. Model 1 shows the effect of these two variables without controls, while model 2 includes control variables for regime type, population, and GDP per capita. The results are very similar across models, with external support to governments being insignificant, while external support to rebels is highly significant. The effect of external support can be found by exponentiating the negative binomial coefficient, yielding the result that the rate of deaths per year is more than 3 times higher for dyad-years where rebels receive external support, according to model 2.

Because external support is expected to alter the capabilities of actors in a civil conflict, it is important to also control for the capabilities of the actors. This accounts for the fact that external support may be more likely among large or small actors, such that the effect of support without controlling for capabilities is detecting a spurious relationship of capabilities and intensity. Model 3 shows the results of support while controlling for the number of troops available to both the government and the rebels. The number of troops themselves is marginally significant and negative for the government, while it is highly significant and positive for the rebels. More importantly, the effect of external support to rebel groups continues to be highly significant after controlling for capabilities, increasing the number of battle deaths per year by 68%. These results indicate that although government capabilities, and external support to governments, has little, if any, effect on conflict intensity, the same factors for rebel groups are highly influential. A linear hypothesis test shows that the difference between the effect of support to rebels and the

effect of support to governments is statistically significant.

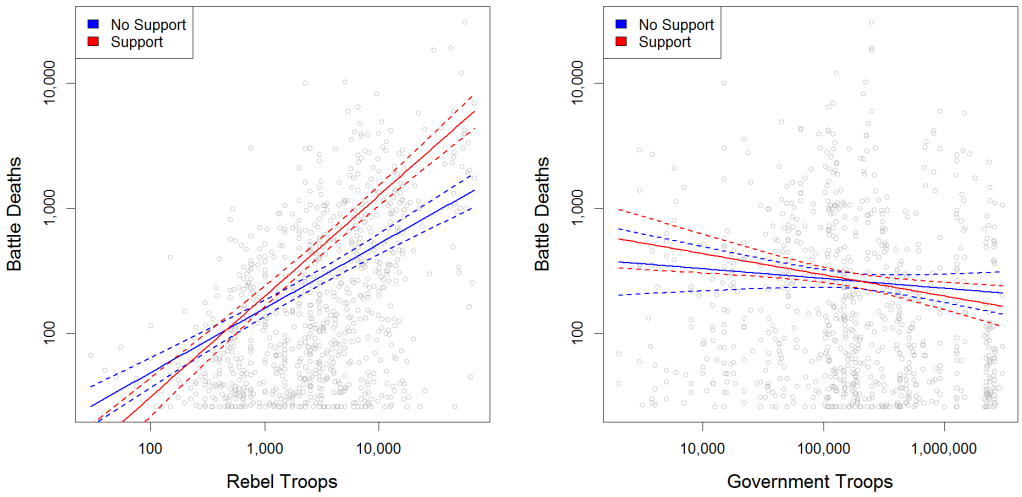

Figure 3.2: Predicted Counts for Interaction Terms

One concern regarding the effect of external support on conflict intensity is that there may be an endogeneity problem, where larger conflicts attract more attention, and therefore more external support. In order to address this issue I have taken several steps. First, I test the effect of external support on intensity, conditional on the size of the rebel force. I then go on to evaluate hierarchical models, with random intercepts by dyad. By allowing every dyad to have a different baseline level of intensity, the variation within groups is shown to be sufficient to find results consistent with what has already been presented.

To evaluate the effect that external support has on actors given different levels of capabilities, model 4, in Table 3.3, interacts the variables for support and capabilities, for both governments and rebels. The regression coefficients

for the base terms and interaction are all significant for the rebels, however the government terms are only marginally significant. Figure 3.2 shows the predicted counts of battle deaths for different levels of capabilities, both with and without external support. The graph on the left shows the effect of rebel capabilities and support, holding support for the other side at 0, and all other variables at their means[2]. It shows that the number of battle deaths in dyads where the rebels receive external support is significantly higher than dyads without support for the rebels, but only when the rebel group is relatively large. The effect becomes significant for rebel groups with more than 1339 troops, which accounts for more that 69% of all dyad-years. This finding helps address the endogeneity problem by showing that dyads with rebel groups that receive external support experience an increase in conflict intensity after accounting for the effect of rebel capabilities as well as the differential effect of support on groups with different levels of capabilities.

3.4.1 Random Intercepts by Dyad

To account for correlation within dyads, Table 3.4 shows the same set of regressions from Table 3.3, but in hierarchical models with random intercepts by dyad. By including random intercepts each dyad is allowed to have a different intercept, and therefore a different baseline level of conflict. This accounts for any unobserved variables that may cause conflicts in one dyad to have a higher

[2]The results are very similar if support for the other side is set to 1. Including support for government forces reduces the standard errors for the prediction for rebel forces, and shifts the results upwards slightly. The effect for government troops shifts upwards somewhat if rebel support is included, however the slope and confidence intervals are unaffected

or lower overall level of violence. Because variation across dyads is accounted for by the random intercepts, the coefficients are based primarily on variation within dyads.

The results show that external support to rebel groups remains significant and positive in the first three models, and external support to governments is now also significant and positive in those models. To evaluate model 4 the results have to be graphed. Figure 3.3 shows that after accounting for random intercepts by dyad, and an interaction between troops levels and external support, the effect of external support is no longer significant. In this model rebel troop levels are highly significant, while government troop levels are not, and external support is insignificant for both rebels and governments. Figure 3.3 also shows the difference in predicted counts for dyads with different random intercepts. Primary results are shown for the median case, however the minimum and maximum values for the random intercepts are also shown. The wide range in intercepts is clearly illustrated.

This finding indicates that the effect of the interaction of the size of rebel groups and the support provided to them is instead a result of dyad-specific factors, which are explained by the large variance in the random intercepts. Although there is variation in the number of rebel troops within a dyad, and in whether the rebels receive support, much of the total variation is across dyads, and when the intercepts are allowed to vary the interaction of the two variables is no longer significant.

Table 3.4: Multilevel Model with Random Intercepts by Dyad

	Dependent variable:			
	Battle Deaths			
	(1)	(2)	(3)	(4)
Gov Support	0.532***	0.539***	0.188*	0.675
	(0.130)	(0.129)	(0.093)	(0.635)
Reb Support	0.699***	0.709***	0.281**	−0.703
	(0.112)	(0.112)	(0.099)	(0.514)
ln(Gov Troops)			−0.141	−0.115
			(0.076)	(0.083)
ln(Reb Troops)			0.539***	0.493***
			(0.043)	(0.048)
Gov Support*Gov Troops				−0.042
				(0.052)
Reb Support*Reb Troops				0.125
				(0.064)
Polity		−0.026	−0.007	−0.008
		(0.016)	(0.012)	(0.012)
ln(Population)		0.078	0.078	0.072
		(0.092)	(0.082)	(0.082)
ln(GDP/capita)		−0.223*	−0.044	−0.038
		(0.096)	(0.065)	(0.065)
Constant	5.033***	5.336***	1.383	1.459
	(0.162)	(1.563)	(1.111)	(1.134)
Observations	861	861	861	861
Log Likelihood	−5,927.831	−5,921.929	−5,649.047	−5,646.905
Akaike Inf. Crit.	11,865.660	11,859.860	11,318.090	11,317.810
Bayesian Inf. Crit.	11,889.450	11,897.920	11,365.670	11,374.910
Note:				*p<0.05; **p<0.01; ***p<0.001

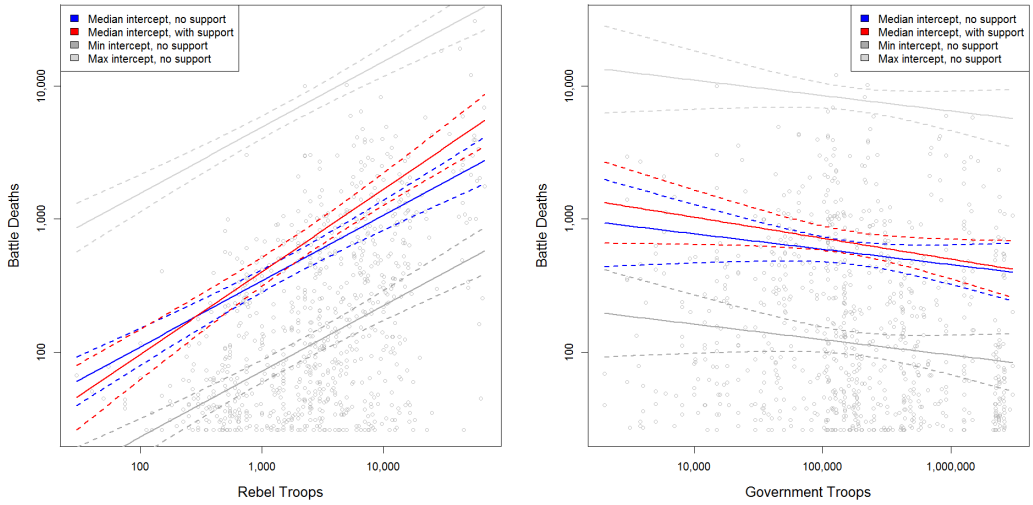

Figure 3.3: Predicted Counts for Interaction Terms, Hierarchical Model

3.4.2 Robustness Checks

To check whether the effect of external support to rebels is having a direct effect on their behavior, or whether it is affecting conflict intensity by increasing the size of rebel forces, I conducted a mediation analysis. This analysis tested the effect of external support, and other covariates, on the number of troops in a rebel group, and then evaluated the mediated effect of both support and rebel troop levels on the number of conflict deaths. Rebel external support is a significant and positive predictor of the size of the rebel force, however the average causal mediation effect (ACME) is not significant, meaning that there is no significant change in the number of battle deaths when the number of rebel troops is changed as though there was support given to the rebels, while the support variable is held at zero. This is likely because the number of rebel

fighters is also significantly predicted by all the other variables in the model, except for GDP per capita. The average direct effect (ADE), which represents the direct effect of external support on battle deaths when the effect of support on the number of troops is ignored, is however significant, and indicates that the primary effect of external support does not operate through the effect of support on troop size.

All regressions were repeated with lagged dependent variables. By including the previous year's battle deaths I correct for possible endogeneity, in the form of conflicts with high battle deaths attracting external support in the next year, which could in turn cause high numbers of battle deaths. Tables showing the results are shown in the appendix, and are very similar to the results without a lagged dependent variable. This indicates that the intensity of conflict in previous periods is not causing changes in the independent variables, which in turn affects the dependent variable in the year being observed. As an additional robustness check, the results from Table 3.3 were repeated after matching cases with and without external support for the rebels. These results are included in the appendix, in Table 3.8.

Additionally, I used covariate balancing propensity scores to ensure that the covariates included in the regressions are not causing both rebel support and large numbers of battle deaths. The results are reported in the appendix, in Table 3.9.

As another robustness check, I control for unobserved country-level variables, by repeating the above analysis with random intercepts by country.

The results are shown in Table 3.7, in the appendix, and show largely similar results.

3.4.3 Disaggregated Support

To further investigate the effect of external support on conflict intensity, I test the effects of different types of support on battle deaths. Table 3.5 repeats models 1-3, but with three different support variables for both the government and the rebels. Support has been disaggregated into three categories, representing cooperation, material support, and assistance from the supporting entity. In all three models governments that cooperate with an outside supporting actor result in increased levels of intensity. For rebel groups the results are different, as cooperation is not significant, however assistance is.

It is interesting that material support is not significant in any of the models. Weapons, munitions, other supplies, and money are all key elements that determine an actor's ability to wage war, and as such one could expect that an increase in the implements of war would lead to an increase in battle deaths resulting from war. The finding that material supplies are not significant indicates that actors are not using all of their capabilities, as giving them more weapons does not cause a simple increase in fighting.

Instead, the findings show that states that cooperate with an outside state cause increased battle deaths, and rebels who receive assistance from an outside actor also fight in such a way that intensity increases. The effect of outside actors is to both increase the capabilities of the actors, and also to

alter their behavior. When governments receive outside assistance from other governments in the form of troops or integration of the two states' military resources, they are able to directly increase their capabilities, however the receiving state's behavior is also altered by the interests of the state they are receiving assistance from. The external state wants to see the receiving state use their increased capabilities, and an increase in the intensity of the conflict illustrates that they are putting their capabilities to use.

Rebels respond differently to the various types of support. The assistance category, which includes training, intelligence, and financial assistance is the only category that has statistically significant effects for rebels. For a rebel group that is waging a guerrilla war against a government, training and intelligence are high priority needs, which can greatly increase the capabilities of such a group. The other categories, cooperation and material assistance, are likely to only be useful to larger organizations. Cooperation with a foreign state requires a large force, and the large civil wars that are likely to attract the direct involvement of foreign troops in support of rebels are likely to already have a high level of intensity. Material assistance seems as though it should have a positive effect, however the effect may be mitigated for small groups, as there is a limit to the size and quantity of military hardware that can be utilized by a small organization.

To understand the effect of different types of support at a lower level, I also ran the above analysis with support disaggregated to the lowest level possible given the UCDP data. The results are shown in the appendix, in Table 3.10,

Table 3.5: Support Disaggregated by Type

	Dependent variable:		
	Battle Deaths		
	(1)	(2)	(3)
Gov Cooperation	0.790***	0.617***	0.608***
	(0.156)	(0.140)	(0.140)
Gov Material	−0.053	−0.140	−0.151
	(0.145)	(0.130)	(0.130)
Gov Assistance	−0.126	−0.079	−0.095
	(0.143)	(0.130)	(0.132)
Reb Cooperation	0.239*	−0.149	−0.159
	(0.110)	(0.098)	(0.098)
Reb Material	0.160	0.081	0.090
	(0.126)	(0.114)	(0.117)
Reb Assistance	1.191***	0.720***	0.707***
	(0.115)	(0.103)	(0.105)
ln(Gov Forces)		−0.087***	−0.084
		(0.026)	(0.059)
ln(Reb Forces)		0.605***	0.608***
		(0.031)	(0.031)
Polity			−0.011
			(0.009)
ln(Population)			0.0004
			(0.060)
ln(GDP/capita)			0.072
			(0.045)
Constant	5.592***	1.946***	1.393
	(0.070)	(0.400)	(0.785)
Observations	861	861	861
Log Likelihood	−5,990.346	−5,848.752	−5,846.741
θ	0.576*** (0.023)	0.731*** (0.030)	0.733*** (0.030)
Akaike Inf. Crit.	11,994.690	11,715.500	11,717.480
Note:			*p<0.05; **p<0.01; ***p<0.001

and indicate that both of the constituent variables that were combined to indicate cooperation above are individually significant for governments, while for rebels only two of the three constituent variables for assistance, namely intelligence and financial assistance, are positive and significant, while the training appears to have a small negative effect on intensity. For example, the Ogaden National Liberation Front (ONLF) received consistent training support from Eritrea from 1999 to 2007, during which period conflict intensity remained below 50 deaths per year. In 2007 the ONLF received intelligence support, as well as integration into the intelligence network of the Oromo Liberation Front (OLF), causing intensity to increase to 152 deaths in 2007, and to further climb to 473 by 2009. In this case the training may have increased future intensity, as the ONLF prepared for conflict for several years, followed by an active period where their past training combined with useful intelligence allowed them to act effectively.

3.4.4 Hierarchical Model of Support by Actor Type

To test the effect of support on the behavior of both actors in a dyad, I estimate an actor based model of the effect of support to an actor on the number of battle deaths that actor inflicts on their opponent, with simultaneous estimation of effects for rebels and governments.

I transformed the dyad-year dataset to an actor-year dataset, so that for every dyad-year there is one observation for the rebel group, as well as for the government. This allows a hierarchical model to calculate separate estimates

for the effect of external support on rebels and governments. By modeling the effect of support on both actors simultaneously, while also including terms modeling the strategic relationship between the actors, this model provides a better estimate of the effect of external support on behavior, while still accounting for the strategic interaction between actors.

This model includes variables for all ten types of external support, as well as including variables for the size of the actor's forces, the size of their opponent's forces, and the number of deaths that the actor suffered in that year. The dependent variable is the number of deaths their opponent suffers.

The support variables and the troop size and own deaths variables are allowed to vary by actor type, meaning that different coefficients are calculated for rebels and governments. The control variables for regime type, population, and per capita GDP are pooled estimates across all observations. By estimating the effect of support on both rebels and governments simultaneously the strategic interaction between them can be modeled. This estimation technique allows for the effect of support to one actor to directly affect that actor, while also accounting for the effect that actors have on each other. By including variables for the number of troops that the opposing side has, as well as the number of deaths inflicted on the actor, the strategic relationship between actors is maintained, while primarily examining the effect of support on effectiveness.

The results show differential effects across types of support, as well as between rebel groups and governments. The number of enemy soldiers an

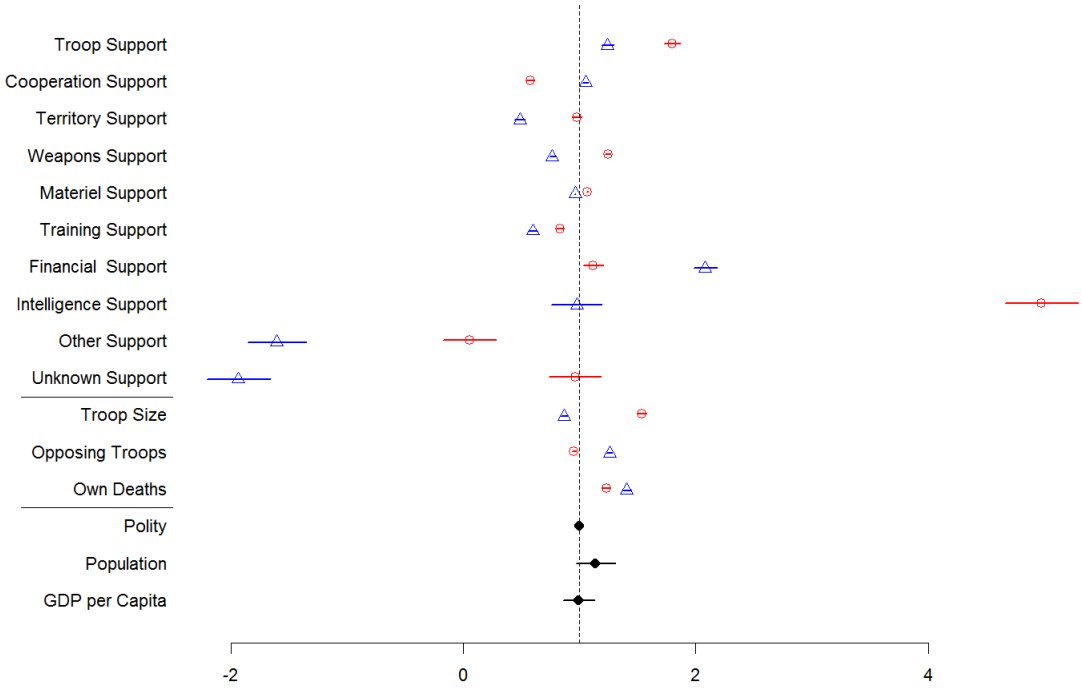

Figure 3.4: Coefficients of Effect on Deaths Inflicted on Opponent, by Actor Type.

Note: Rebel estimates are red circles, and governments are blue triangles. Pooled estimates are black dots.

actor is able to kill is increased when an external actor supplies troops as a secondary warring party. This is true for both governments and rebels. When rebels receive this direct support it increases the effective number of soldiers they have at their disposal, and allows them to increase their attacks upon government targets. When governments receive foreign troops to assist them, the increased capabilities could be expected to produce a deterrent effect, and drive the rebels into hiding, however the country providing the external support is likely to be highly motivated to actively pursue the rebel forces, increasing the motivation from the government side to actively search out the rebels.

Access to the military and intelligence infrastructure of an external actor has a positive effect on governments, and a negative effect on rebels. This is possibly because the governments are usually receiving assistance from other states, with large and effective infrastructures, while for rebel groups this variable often indicates that they are cooperating with rebel groups in neighboring states. These two form of cooperation are significantly different in substance, explaining the differential effect.

Access to territory in a foreign state has a significant negative effect on conflict intensity for governments. It is however also relatively rare for governments to receive this type of support, and it is usually in cases where the government is relatively weak, as strong states do not require external territory to wage civil wars within their own borders. On the other hand, rebel groups that receive foreign basing do not have a significantly higher or lower degree

of efficiency in fighting their enemy. Territorial support for rebels does not by itself give the rebels any added capability, but instead provides them with a safe haven to retreat to and train at. This could provide a mixed effect of increasing their effectiveness when they are in combat, but also remove them from combat when they are taking advantage of this foreign territory.

The provision of weaponry to rebels has a positive effect on their effectiveness, whereas it reduces the number of rebels killed by the government. Giving an actor weapons is one of the most direct ways to increase an actor's capability to fight and to kill their enemy. The fact that weapons increase the ability of the rebels to kill government soldiers is therefore not surprising. The negative effect for the government may at first seem incongruous, however it makes sense in the context of a strategic relationship between the government and the rebels. Increasing the armaments available to the government will change the behavior of the rebels. In the face of an increasingly deadly government army, the rebels will avoid direct confrontation, and instead rely on guerrilla tactics. The government, now more secure militarily, will not consider the rebels as threatening, and therefore will not pursue them as intensely, decreasing the number of rebel deaths.

Materiel support, consisting of equipment other than weapons and ammunition, has a small positive effect on rebels and a small negative effect on governments. The different directions of support are consistent with the theory of strategic decision-making regarding tactics, and the small size is likely the result of the support consisting of non-lethal equipment. The marginal

increase in effectiveness for rebels will allow them to fight more effectively, while the increase in effectiveness for the government will improve government capabilities and therefore deter rebel attacks.

Training has a negative effect on the number of battle deaths actors cause. The effect is larger for governments, and expected, as a well trained government military will deter rebels. The negative effect for training support given to rebels could indicate that the rebel forces that are receiving the training are not well trained in the first place, and therefore not effective. This anomalous finding could therefore be the result of a selection effect.

Financial support has a positive effect for both actor types. The effect is especially large for governments. This may indicate that governments are responding to the need to demonstrate effectiveness to their external supporter. Financial support is highly desirable to actors, and governments are likely to seek out large economic contributions. A government which wants to continue to receive financial assistance may be under pressure to demonstrate that the money is being put to good use on the battlefield.

Intelligence support has the largest effect of all support types, but only for rebels. Rebel groups are almost always at a disadvantage in numbers and capabilities, and intelligence provided from an external actor can greatly increase their ability to fight the stronger government forces. In an asymmetric conflict the added information given by an outside supporter could greatly improve the ability of the rebels to identify targets where their forces can be put to good use.

The results for the number of troops an actor controls, as well as the number of troops on the opposing side, controls for the baseline level of capabilities that the actors have. This allows the effect of the external support variables to be interpreted while also accounting for the size of the two forces involved. The results of these variables show that large rebel armies kill large numbers of government soldiers, while large government armies kill fewer rebels than smaller government armies. The variable for the size of the opposing troops indicates the size of the enemy forces that the actor is trying to kill. The coefficient for the government indicates that when the government is facing a larger rebel army they inflict more battle deaths on them. On the other hand, rebels fighting large government armies kill fewer soldiers.

The number of deaths an actor suffers in a year is significant and positive for both actors. This term controls for the strategy of an actor's opponent, as the number of deaths an actor suffers is largely the result of decisions made by their opponent. When an opponent chooses an aggressive strategy that results in a larger number of deaths for an actor, we would also expect that actor to kill large numbers of their opponent's soldiers. By controlling for this interaction between actors it addresses the possibility that when one actor receives support could alter the behavior of their opponent.

3.5 Conclusion

The strategic interactions between rebels and governments result in an asymmetric result of external support. Support to rebel groups greatly increases conflict intensity, while most support to governments appears to have little effect on intensity. Foreign support directly affects capabilities, however it also affects the strategic decisions of actors. When rebels are the beneficiaries of support from a foreign government they not only are able to generate more force, but they are able to come out of the shadows of insurgency and put their strength to use in more direct attacks against government forces. They have an incentive to use their new capabilities to demonstrate their effectiveness to their foreign supporter.

The effect of different types of support differs for governments and rebels. This is because of the different needs of the two types of actors, as well as the political situation surrounding them. Foreign states that assist a government can provide troops and cooperation between the two militaries in an open manner that is rare when supporting rebel groups. This open, and large scale support allows for governments to fight much more intensely, and gives the external supporter a large influence in how the war is conducted. Outside actors that want to see a rebel group defeated are able to increase the intensity of fighting by becoming deeply involved in the conflict.

Rebels have very different needs, given their weaker military position in most conflicts. Intelligence assistance can be easily given in a covert manner, and allows rebels to drastically improve their attacks against state forces.

Financial assistance also improves rebels ability to fight, and provides them with an incentive to demonstrate their value to their benefactor. By increasing the rate and intensity of attacks, rebel groups can make a strong argument to their supporter that the financial assistance they are receiving is being put to good use, and should continue.

The academic literature on civil conflict has largely focused on conflict onset, duration, and termination, with little attention paid to the dynamics within a war. The focus on these factors is justified by the policy interest in preventing future wars and ending current ones, however without a full understanding of how actors behave within wars, it is difficult to fully understand how to end them. This paper adds to the understanding of how foreign states affect the strategic decisions of actors within wars. Rebels and government forces respond to support by altering how they wage war. Understanding how actors make strategic decisions about how to fight will aid in understanding how actors decide to end wars.

The findings in this paper point to the effect of capabilities and incentives on intensity. External support increases conflict intensity, even when controlling for the size of the forces on both sides of the conflict. This indicates that the effect is not purely based on the capabilities of the forces, but that support also affects the way those forces are used, and the incentives the actors have to engage in conflict behavior that results in large numbers of battle deaths.

Foreign intervention into civil conflicts is a political decision, and this research helps understand the impact of these decisions. With the exception

of training rebels, all other forms of support either have no effect or increase conflict intensity. There are a number of justifications given by states when they decide to intervene in a civil conflict. One of those justifications is a desire to reduce violence, either by supporting a government so they can end the rebellion, or by strengthening the rebels so that they can force a peace. The findings of this paper show that the support will actually increase the number of people dying in conflict, rather than reducing the number of deaths.

3.6 Appendix

This appendix contains a series of robustness checks, to verify the results reported in the main analysis. The first section repeats the main analysis of the effect of external support on battle deaths, while controlling for battle deaths in the previous year. The Next two sections use matching, and weighting based on the covariate balancing propensity score, to ensure that the results are not the results of outliers, or unlikely cases of external support. The following three sections provide extra detail on the effect of different types of external support, and on the different effects support has to rebels and governments.

3.6.1 Lagged Dependent Variable

To control for the possibility that large conflicts, with many battle deaths, are more likely to attract external support than less violent conflicts, I ran models that include a variable for the number of battle deaths in the previous year. These models show that although battle deaths in the previous year are a very good predictor of battle deaths in the current year, rebel support and rebel troops remain highly significant as well, showing that the effect of external support to rebels increasing the number of battle deaths is not a result of large conflicts attracting the interest of foreign states.

The random intercepts by country from the multilevel model with lagged battle deaths are shown in Figure 3.5. The intercepts have been exponentiated, to represent the baseline number of battle deaths represented by the intercept

Table 3.6: Negative Binomial Controlling for Previous Year's Battle Deaths

	Dependent variable:			
	Battle Deaths			
	(1)	(2)	(3)	(4)
Gov Support	0.197*	0.158	0.080	1.549**
	(0.086)	(0.088)	(0.081)	(0.601)
Reb Support	0.716***	0.615***	0.310***	−0.882
	(0.088)	(0.088)	(0.081)	(0.481)
ln(Gov Troops)			−0.189***	−0.121
			(0.056)	(0.064)
ln(Reb Troops)			0.502***	0.439***
			(0.031)	(0.039)
Gov Support*Gov Troops				−0.123*
				(0.049)
Reb Support*Reb Troops				0.151*
				(0.060)
Polity		−0.033***	−0.023**	−0.020*
		(0.008)	(0.008)	(0.008)
ln(Population)		−0.004	0.104	0.089
		(0.030)	(0.058)	(0.058)
ln(GDP/capita)		0.035	0.108**	0.107*
		(0.038)	(0.042)	(0.042)
lagged_deaths	0.001***	0.001***	0.0005***	0.0004***
	(0.00003)	(0.00003)	(0.00002)	(0.00003)
Constant	5.258***	5.155***	1.145	1.041
	(0.072)	(0.650)	(0.757)	(0.804)
Observations	861	861	861	861
Log Likelihood	−5,921.841	−5,912.714	−5,802.745	−5,796.825
θ	0.646*** (0.026)	0.655*** (0.027)	0.791*** (0.033)	0.799*** (0.033)
Akaike Inf. Crit.	11,851.680	11,839.430	11,623.490	11,615.650
Note:				*p<0.05; **p<0.01; ***p<0.001

Table 3.7: Controlling for Previous Year's Battle Deaths, with Random Intercepts

	Dependent variable:		
	Battle Deaths		
	(1)	(2)	(3)
Gov Support	0.333***	0.175	0.714
	(0.097)	(0.092)	(0.626)
Reb Support	0.387***	0.275**	−0.537
	(0.104)	(0.098)	(0.510)
ln(Gov Troops)		−0.150*	−0.120
		(0.074)	(0.081)
ln(Reb Troops)		0.512***	0.467***
		(0.042)	(0.047)
Gov Support*Gov Troops			−0.046
			(0.051)
Reb Support*Reb Troops			0.107
			(0.064)
Polity		−0.009	−0.010
		(0.012)	(0.011)
ln(Population)		0.076	0.073
		(0.080)	(0.079)
ln(GDP/capita)		−0.026	−0.024
		(0.063)	(0.063)
lagged_deaths	0.0002***	0.0001***	0.0001***
	(0.00004)	(0.00004)	(0.00004)
Constant	4.704***	1.574	1.577
	(0.107)	(1.081)	(1.090)
Observations	861	861	861
Log Likelihood	−5,711.300	−5,640.287	−5,638.613
Akaike Inf. Crit.	11,434.600	11,302.580	11,303.230
Bayesian Inf. Crit.	11,463.150	11,354.910	11,365.080
Note:			*p<0.05; **p<0.01; ***p<0.001

of the regression equation. This number is not meaningful in itself, since there are no cases with zeros for all of the independent variables, however it provides an indication of the unexplained variance by country. Many of the countries have large confidence intervals around their intercepts, indicating that the difference between most pairs of countries is not significant, however comparisons of countries with the lowest and highest intercepts does appear to be statistically significant. This indicates that there are statistically significant country-level factors that affect conflict intensity that are not included in the analysis.

Most of the countries with large intercepts have experienced large conflicts, such as Sri Lanka and Angola, although Russia has the largest intercept, despite having an average intensity only slightly above the above the median. This is probably a result of the large government army in Russia. Government troops have a negative effect on predicted intensity, and the large number of Russian troops would, without a random intercept, indicate that they should have a smaller number of battle deaths than is observed.

All of the countries with small intercepts have experienced low intensity conflicts. Civil conflicts in Iran have averaged only 51 deaths per year, and Bangladesh and Egypt average 36 and 103 deaths per year. Myanmar has the second highest number of dyad-year observations, however most of them are very low intensity, producing an average of only 133 battle deaths per year, which is just slightly above their intercept of 80.

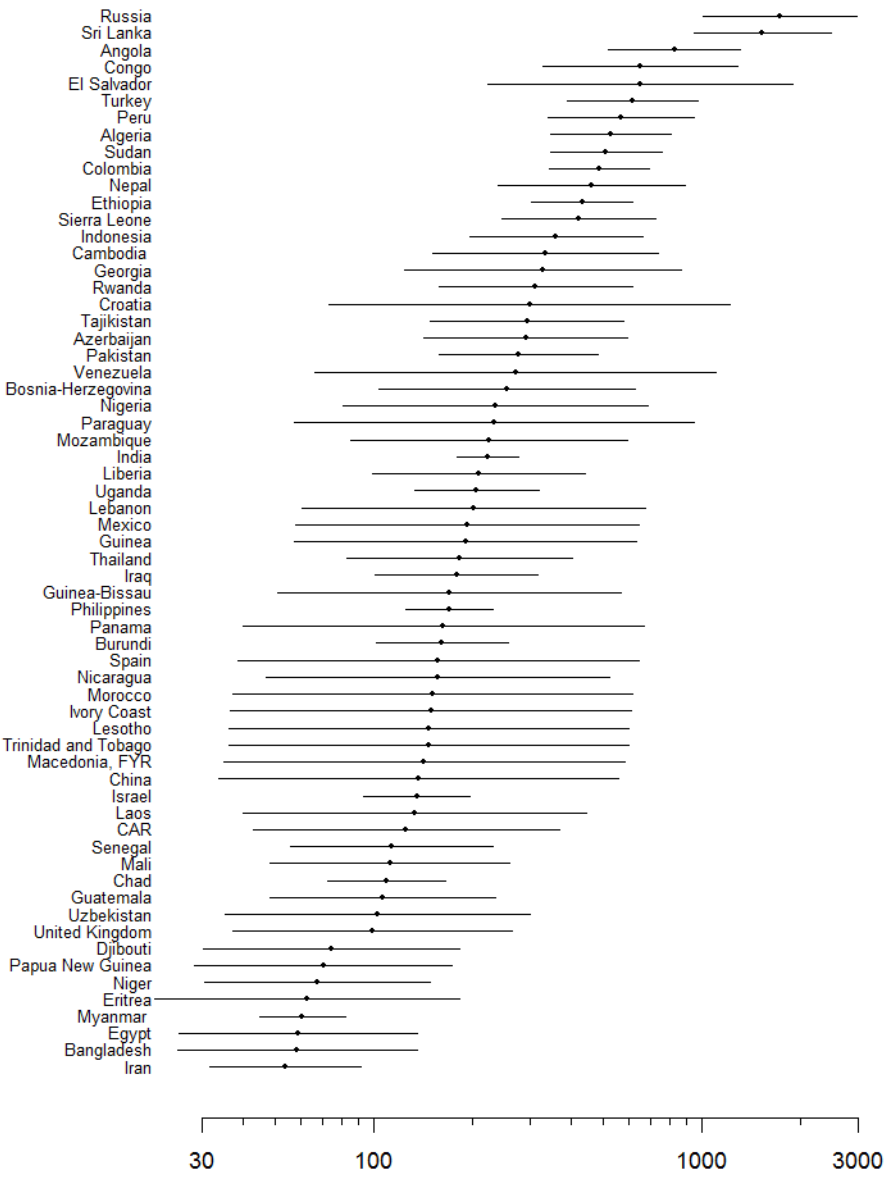

Figure 3.5: Conflict Baseline by Country (Exponentiated Random Intercepts)

3.6.2 Matching

As a robustness check, the regressions from Table 3.3, showing negative binomial regressions of external support on battle deaths for governments and rebels, are repeated here, after matching cases of support and no support for rebels. Matching reprocesses the data so that the treatment group is as similar as possible to the control group (Ho, Imai, King and Stuart, 2007). By matching cases without rebel support to the cases with rebel support that have the most similar values on other variables, the results of rebel support are less likely to be driven by outliers of covariates. There are more dyad-year observations with rebel support than there are without it, so the matching process drops 157 cases with support, and keeps all 355 cases without support, as well as the most similar 355 cases with support.

Having balanced the dataset, I then reran the previously reported regressions. The results of the repeated regressions using the matched data are shown in Table 3.8. The results are largely unchanged after matching. Rebel support remains significant in all models, as does the number of rebel troops. The interaction term for rebel troops and rebel support is also highly significant after matching. The government variables are not significant in any of the models.

Table 3.8: Negative Binomial Regressions of Support on Battle Deaths with Matching

	Dependent variable:			
	Battle Deaths			
	(1)	(2)	(3)	(4)
Gov Support	0.196	0.186	0.102	0.812
	(0.106)	(0.109)	(0.097)	(0.738)
Reb Support	1.044***	1.016***	0.576***	−1.957***
	(0.105)	(0.104)	(0.092)	(0.575)
ln(Gov Troops)			−0.096	−0.094
			(0.065)	(0.075)
ln(Reb Troops)			0.652***	0.488***
			(0.036)	(0.052)
Gov Support*Gov Troops				−0.062
				(0.061)
Reb Support*Reb Troops				0.316***
				(0.070)
Polity		−0.038***	−0.010	−0.009
		(0.010)	(0.010)	(0.010)
ln(Population)		0.052	0.004	0.037
		(0.038)	(0.067)	(0.067)
ln(GDP/capita)		0.062	0.099*	0.128**
		(0.046)	(0.049)	(0.049)
Constant	5.709***	4.417***	0.774	1.269
	(0.096)	(0.804)	(0.888)	(0.962)
Observations	710	710	710	710
Log Likelihood	−5,079.330	−5,073.134	−4,945.453	−4,935.510
θ	0.515*** (0.023)	0.521*** (0.023)	0.673*** (0.030)	0.686*** (0.031)
Akaike Inf. Crit.	10,164.660	10,158.270	9,906.906	9,891.020
Note:				*p<0.05; **p<0.01; ***p<0.001

3.6.3 Covariate Balancing Propensity Score

As an additional robustness check, I also reestimated Table 3.3, weighted by the covariate balancing propensity score. This method models treatment assignment, while also correcting for the balance of covariates in an observational sample. This corrects for both the likelihood that a particular observation would be exposed to the treatment, which in this case is external support to rebels, while also accounting for the balance of values of other covariates. Balancing the covariates and estimating the propensity score for rebel support are calculated simultaneously. This methodology has been shown to improve on propensity score matching and weighting methods (Imai and Ratkovic, 2014).

Table 3.9 shows the results of the negative binomial regressions using the covariate balancing propensity score. The results show that, after weighting observations the results remain consistent with the results shown in the main analysis and the results from the analysis using matching. The effect of support to rebel groups is significant in all models, including when interacted with the number of rebels troops. The coefficients for rebel support increase slightly. Government support remains insignificant in all models.

Table 3.9: Negative binomial regressions with weighting by covariate balancing propensity score

	Dependent variable:			
	Battle Deaths			
	(1)	(2)	(3)	(4)
Gov Support	0.091	0.107	0.072	1.097
	(0.148)	(0.150)	(0.136)	(1.032)
Reb Support	1.277***	1.288***	0.697***	−1.805*
	(0.146)	(0.147)	(0.136)	(0.845)
ln(Gov Troops)			−0.120	−0.092
			(0.090)	(0.105)
ln(Reb Troops)			0.596***	0.464***
			(0.051)	(0.070)
Gov Support*Gov Troops				−0.089
				(0.086)
Reb Support*Reb Troops				0.304**
				(0.101)
Polity		−0.032*	−0.010	−0.006
		(0.014)	(0.014)	(0.014)
ln(Population)		0.154**	0.104	0.114
		(0.053)	(0.093)	(0.093)
ln(GDP/capita)		0.018	0.073	0.095
		(0.064)	(0.069)	(0.069)
Constant	5.757***	2.978**	−0.025	0.353
	(0.129)	(1.095)	(1.230)	(1.344)
Observations	867	867	867	867
Log Likelihood	−2,565.717	−2,561.321	−2,509.792	−2,505.151
θ	0.533*** (0.033)	0.543*** (0.034)	0.667*** (0.043)	0.680*** (0.044)
Akaike Inf. Crit.	5,137.434	5,134.643	5,035.584	5,030.303
Note:				*p<0.05; **p<0.01; ***p<0.001

3.6.4 Disaggregated Support

As a robustness check for the hierarchical model of support by actor type, Table 3.10 includes all types of support at the lowest level possible given the UCDP external support data, at the dyad level. This shows that support to governments in the form of troops from an external supporter that fight as a secondary warring party increase intensity, as does cooperation in the form of the government being integrated into the military and intelligence system of the external supporter. This cooperation variable indicates not just assistance, such as the supporter providing intelligence or logistics, but integration of the civil war actor into the military and intelligence system of the supporting state. In both of these cases the effect of external support is positive, as external actors who cooperate with state militaries are interested in increasing the tempo of conflict, in order to bring a conflict to a resolution. The behavior of governments that might otherwise be inclined to contain conflicts and minimize fighting is changed by the actions of foreign states. An outside actor that offers cooperation to a government will likely be interested in defeating a rebel threat that somehow also affects the supporting state. In this case the change in intensity is due to a political agreement between the state fighting the war, and the outside state that is supporting it.

It is also interesting to note that materiel support to governments appears to be significant when analyzed without controlling for capabilities, however when the level of government troops is included the effect of materiel support falls out of significance. This indicates that while the fighting capacity of state

Table 3.10: Support Disaggregated to Lowest Level Groups

	Battle Deaths		
Gov Troops	0.485	0.969***	0.895**
	(0.306)	(0.279)	(0.279)
Gov Cooperation	0.446*	0.359*	0.362*
	(0.187)	(0.166)	(0.166)
Gov Territory	0.601	0.318	0.382
	(0.458)	(0.407)	(0.407)
Gov Weapons	0.299	−0.227	−0.210
	(0.204)	(0.186)	(0.189)
Gov Materiel	−0.552**	−0.171	−0.197
	(0.204)	(0.183)	(0.184)
Gov Training	0.166	0.129	0.169
	(0.121)	(0.109)	(0.115)
Gov Funding	−0.063	0.030	−0.035
	(0.141)	(0.128)	(0.140)
Gov Intelligence	0.054	−0.089	−0.134
	(0.191)	(0.171)	(0.172)
Gov Other	−0.104	−0.185	−0.160
	(0.927)	(0.824)	(0.825)
Gov Unknown	−5.487***	−4.859***	−4.804***
	(1.423)	(1.266)	(1.264)
Reb Troops	0.761	0.916*	0.796
	(0.508)	(0.452)	(0.453)
Reb Cooperation	0.053	−0.190	−0.152
	(0.151)	(0.135)	(0.135)
Reb Territory	0.284*	0.041	0.007
	(0.119)	(0.106)	(0.106)
Reb Weapons	0.156	0.017	0.056
	(0.165)	(0.146)	(0.148)
Reb Materiel	0.359	0.233	0.251
	(0.199)	(0.179)	(0.179)
Reb Training	−0.218	−0.275*	−0.306*
	(0.143)	(0.128)	(0.129)
Reb Funding	0.960***	0.778***	0.747***
	(0.126)	(0.113)	(0.115)
Reb Intelligence	1.284**	1.021**	1.127**
	(0.409)	(0.363)	(0.366)
Reb Other	0.624*	−0.087	−0.089
	(0.271)	(0.243)	(0.243)
Reb Unknown	0.014	0.520	0.481
	(0.493)	(0.438)	(0.438)
ln(Gov Forces)		−0.071**	−0.103
		(0.027)	(0.061)
ln(Reb Forces)		0.605***	0.610***
		(0.031)	(0.032)
Polity			−0.001
			(0.009)
ln(Population)			0.011
			(0.061)
ln(GDP/capita)			0.085
			(0.045)
Constant	5.691***	1.773***	1.348
	(0.067)	(0.418)	(0.773)
Observations	861	861	861
Log Likelihood	−5,963.472	−5,821.462	−5,819.644
θ	0.602*** (0.025)	0.766*** (0.032)	0.768*** (0.032)
Akaike Inf. Crit.	11,968.940	11,688.920	11,691.290
Note:			*p<0.05; **p<0.01; ***p<0.001

militaries is significant, the effect of external support that increases capabilities is reflected in the troop level variable. The effect of materiel support and the effect of government troops levels are both negative, indicating that more capable government armies decrease the intensity of conflict.

For rebel groups the findings are very different. Troops as a secondary warring party is only significant in the second model in Table 3.10, and co-operation is insignificant in all models. The provision of territory in a foreign state to a rebel group is significant in the first model, but is not robust to controls for rebel capabilities. The variables that do have a significant effect are training, funding, and intelligence. None of these were significant for governments, indicating that the determinants of conflict intensity operate very differently for rebels and governments.

Surprisingly, when a foreign state trains rebel troops it results in a decrease in battle deaths. This could possibly indicate a short term decline, as troops are removed from the battle field, and the rebel group alters their strategy to take a long-term view of the conflict, as training requires a longer time scale to affect the outcome of the conflict than other more direct effects.

Funding and intelligence provided to rebel groups are highly significant in all models, and have large positive effects on intensity. Funding more than doubles the intensity of a conflict, while providing intelligence to a rebel group can triple conflict intensity. The provision of money to rebel groups likely allows those groups to fund increased operations, which increases the effectiveness of the troops that they have under their control, as well as incentivizing them

to take action in order to demonstrate effectiveness to their supporter, in an effort to ensure continued funding.

Providing intelligence to a rebel group increases intensity by filling a need that that group faces, and improving their ability to fight, as well as through political interactions between the rebels and the external supporter. The practical effects of intelligence are especially large given that most rebel groups are much weaker than the states they are fighting, and this weakness requires them to rely on guerrilla tactics. Intelligence assistance will greatly improve their ability to locate exploitable targets, providing them with more, and better, opportunities to fight the government on terms that are favorable to them.

The large effect of intelligence on rebels is also likely the result of political effects from the interaction of the rebels and the government. The external actor has an interest in helping that rebel group, and often that interest is really an interest in inflicting harm on the government. The outside actor will provide information to the rebels that allows the rebels to do damage to the state in such a way that the supporting state benefits. The rebels must exploit this intelligence, by launching attacks, or they risk loosing the support of their benefactor. This encourages a rebel group to take action against the government, to demonstrate their effectiveness and value to the foreign state that is supporting them. Support in the form of intelligence therefore incentivizes a rebel group to take more action in order to demonstrate their effectiveness, while also making them more effective when they do take action. These factors combine to result in a tripling of intensity when outside actors

support rebels.

3.6.5 Separate Analysis for Rebels and Governments

Although the total number of battle deaths in a conflict is the result of the interaction of rebel and government strategies, external support given to one actor only affects the capabilities of that particular actor. To be sure that the external support to an actor is altering their behavior, the battle deaths from a conflict can be divided into deaths suffered by the government and by the rebels. This allows for estimation of the effect of support on the lethality of the actor the support is given to.

Because we cannot directly observe the behavior of individual actors in a conflict, but instead only see the deaths resulting from combat between actors, the best measure of the capability of a particular actor is the number of battle deaths sustained by the opposing side in the conflict. This means that support to rebels should alter rebel behavior, which in turn should result in a change in the number of battle deaths sustained by the government. Conversely, support to the government should affect the number of battle deaths inflicted on the rebels.

In order to model the effect of external support to one side on the battle deaths of the other side while also accounting for both actors' strategic decisions, it is important to take into account the actions of both sides. To do this, I include the number of battle deaths sustained by the side receiving the support, such that deaths for both actors are included in the equation, with one

as the dependent variable, and the other as one of the independent variables. This technique allows for the battle deaths of one side to be estimated based on the capabilities of both actors, as well as the behavior of their opponent. An additional benefit is the ability to estimate the response in lethality of one side as a reaction to a change in the lethality of the other.

Including the number of battle deaths for the opposing side brings into the analysis a measure of overall intensity, as well as the reciprocity that is inherent in the strategic behavior of war, while allowing for an understanding of how support to a single actor affects their capabilities.

Table 3.11 shows the effect that support to rebel groups has on the number of government deaths. The earlier finding, that training rebels decreases total battle deaths, while funding and intelligence increases total battle deaths holds true when looking only at government battle deaths. This supports the theory, since the increase in total deaths due to intelligence and funding, is shown to be the result of the rebels increase in capabilities causing an increase in government deaths.

Looking only at government deaths, the variable for cooperation between rebels and foreign supporters becomes significant and negative. When rebel armies are integrated into the military and intelligence infrastructure of an external supporter the number of government troops killed declines. This is possibly the result of the political influence of the external supporter restraining the rebels, causing them to launch fewer, or less deadly, attacks. It could also be the result of external supporters choosing to cooperate with rebel

Table 3.11: Negative Binomial Regressions Using Deaths for Both Sides

	Dependent variable:	
	Government Deaths	
	(1)	(2)
Reb Troops	−0.259	0.675
	(0.554)	(0.498)
Reb Cooperation	−0.493**	−0.423**
	(0.175)	(0.158)
Reb Territory	−0.029	0.021
	(0.137)	(0.124)
Reb Weapons	0.341	0.350*
	(0.193)	(0.174)
Reb Materiel	0.195	−0.023
	(0.231)	(0.208)
Reb Training	−0.308	−0.349*
	(0.167)	(0.151)
Reb Funding	0.738***	0.386**
	(0.148)	(0.133)
Reb Intelligence	3.261***	4.525***
	(0.465)	(0.421)
Reb Other	−1.264***	−1.095***
	(0.310)	(0.279)
Reb Unknown	−0.316	−0.225
	(0.572)	(0.514)
ln(Reb Deaths)		0.391***
		(0.024)
ln(Gov Forces)	−0.076	−0.016
	(0.075)	(0.068)
ln(Reb Forces)	0.649***	0.438***
	(0.041)	(0.038)
Polity	−0.014	−0.034***
	(0.011)	(0.010)
ln(Population)	0.120	0.145*
	(0.077)	(0.070)
ln(GDP/capita)	0.124*	−0.016
	(0.057)	(0.052)
Constant	−2.901**	−2.988***
	(0.996)	(0.901)
Observations	861	861
Log Likelihood	−4,437.084	−4,328.628
θ	0.450*** (0.020)	0.559*** (0.026)
Akaike Inf. Crit.	8,906.169	8,691.256
Note:	*p<0.05; **p<0.01; ***p<0.001	

groups who are less deadly. The regression includes controls for the size of the rebel army, so if this finding results from selection, it would be because the external supporter was selecting rebel groups that kill relatively few government soldiers given the size of the rebel force. Most cases of integration of rebel forces with external supporters consist of cases of cooperation between rebel groups in neighboring states. The cross-border nature of this cooperation could indicate that rebels are operating in border areas, and spending time interacting with their rebel-allies rather than focusing on direct combat operations.

Even after accounting for external support, the size of the rebel groups remains significant, with larger rebel groups killing more government forces. Interestingly, the size of the government army is not significant, despite it defining the upper limit of the dependent variable. This demonstrates that the rate of government deaths is not simply based on the number of government soldiers available to be killed, but instead based on the strategic relationship between the rebels and government forces.

Table 3.12 shows how external support to governments affects the number of rebel soldiers who die in a dyad-year. Funding from an external supporter has a very large effect, increasing the number of rebel battle deaths by 2.5 times. Other and unknown support have slightly significant, but very large negative effects. The size of the government army does not have a significant effect on the number of rebel deaths, however the size of the rebel army does. This supports the theory that rebel capabilities are the primary determinant of

Table 3.12: Negative Binomial Regressions Using Deaths for Both Sides

	Dependent variable:	
	Rebel Deaths	
	(1)	(2)
Gov Troops	0.423	0.048
	(0.406)	(0.360)
Gov Cooperation	0.250	0.091
	(0.237)	(0.211)
Gov Territory	0.923	0.185
	(0.587)	(0.520)
Gov Weapons	−0.280	−0.216
	(0.275)	(0.244)
Gov Materiel	−0.539*	−0.282
	(0.266)	(0.236)
Gov Training	0.175	−0.172
	(0.164)	(0.146)
Gov Funding	0.485*	0.928***
	(0.203)	(0.181)
Gov Intelligence	−0.008	−0.104
	(0.249)	(0.221)
Gov Other	−2.320	−2.315*
	(1.216)	(1.063)
Gov Unknown	−4.748**	−3.637*
	(1.778)	(1.596)
ln(Gov Deaths)		0.540***
		(0.030)
ln(Gov Forces)	−0.161	−0.070
	(0.087)	(0.078)
ln(Reb Forces)	0.597***	0.203***
	(0.044)	(0.043)
Polity	0.039**	−0.004
	(0.013)	(0.011)
ln(Population)	0.028	0.012
	(0.087)	(0.078)
ln(GDP/capita)	0.146*	0.026
	(0.064)	(0.057)
Constant	0.746	1.712
	(1.124)	(1.005)
Observations	861	861
Log Likelihood	−4,826.414	−4,697.439
θ	0.359*** (0.015)	0.459*** (0.020)
Akaike Inf. Crit.	9,684.828	9,428.877
Note:	*p<0.05; **p<0.01; ***p<0.001	

both rebel and government strategy. Absent strategic decisions, large government armies should be able to kill large numbers of rebels. However, instead we see that the size of the rebel force is responsible for increasing the intensity with which the government pursues the rebels.

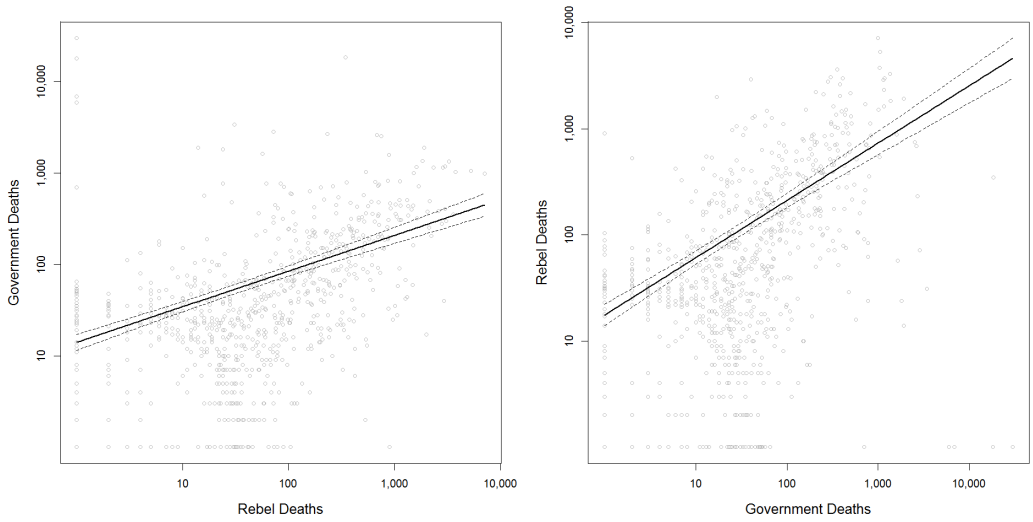

Figure 3.6: Predicted Effect of Increased Deaths for One Actor on Battle Deaths of the Other

In both sets of regression above, the number of battle deaths for one side is a significant and positive predictor of the number of battle deaths for the other. In both cases the coefficient is below one, indicating that for every additional soldier on that side who dies in combat, there are fewer than one additional battle deaths from the other side. This estimate is made while holding the size of the rebel and government forces constant, and accounting for the level of external support. This situation models a change in the tactics used by an actor, while holding the capabilities constant, and indicates that there are

diminishing returns to aggressive tactics.

Figure 3.6 shows the predicted number of deaths for one side given any number of deaths by the other. The two graphs are the results of the models in Tables 3.11 and 3.12. In both cases, the lines have positive slopes that are less than one, indicating that, when holding the size of the two forces constant, increasing the number of deaths from one side does not increase the number of deaths from the other side by an equal amount. Holding capabilities of one actor constant and increasing the number of deaths that that side experiences models a change in tactics. At low levels of battle deaths the actor whose capabilities are being modeled has an advantage in terms of the ratio of their deaths to those of their opponent. However, as the number of deaths increases, the ratio changes, giving the advantage to their opponent.

This finding shows that a force, either rebel or government, that takes an aggressive strategy, without increasing their capabilities, will face diminishing returns in terms of the ratio of losses in combat. The effect is particularly severe for rebels. Rebel groups that make aggressive tactical choices that result in more deaths for their own forces, will not see a commensurate increase in the number of government troops killed. This finding supports the argument that rebel strategy is based largely on their capabilities, as adopting a more aggressive strategy with fixed capabilities will deplete rebel force faster than the government force. This dynamic is made even more dangerous given the fact that rebel forces are usually much smaller than those of the government.

3.6.6 Differential Effects by Actor Type

External support increases the capabilities of one actor, as well as encouraging them to use their capabilities in an increasingly aggressive manner. The combined effect should be to increase conflict intensity, however to be sure that the increased capabilities are resulting in the supported actor fighting harder, I test the effect of external support to one actor on the number of battle deaths inflicted on the other actor. This helps to demonstrate more effectively that the effect of the support is to increase the lethality of the actor that receives the support, by showing that that actor kills a larger number of enemy combatants when they receive support.

Table 3.13 shows the results of regressions on the total number of battle deaths, followed by the same regressions on the number of government deaths and then rebel deaths. These regressions use the same specification as in Table 3.3, in the main text, with different dependent variables, as well as the addition of the number of battle deaths on the side not measured in the dependent variable. This allows for a comparison of the number of deaths caused by external support on total battle deaths to the number of deaths inflicted on the enemy, while also correcting for the overall intensity, by including the number of deaths suffered by the supported side.

When looking at the presence or absence of support for rebels, the number of government deaths does not increase when rebels receive support. However, the number rebel deaths does increase. This indicates that contrary to the idea that support will improve the rebels' ability to fight and kill government

soldiers, the support appears to be causing more rebel troops to die. This could be the result of rebels increasing their efforts, in response to pressure from their external sponsor, and selecting into more combat events, including non-advantageous ones. The overall conflict intensity increases, however it is largely the result of more rebels dying. For governments, the provision of support appears to have no effect on either the number of rebels or government soldiers who die.

To further disaggregate the effects of support to one actor on the number of deaths suffered by their opponent, Figure 3.7 shows the result of a hierarchical model in which the effect of support to one actor, disaggregated into six categories, predicts the number of deaths suffered by the opponent. Values for variables in this analysis reflect the value for the labeled side, with the exception of the variable 'Opposing Troops,' which reflects the number of troops for the opponent. The dependent variable is the number of deaths inflicted on the opposing side, such that the results labeled as 'Rebels' are predicting the number of government deaths.

The coefficients for the types of support show that giving weapons to rebels increases the number of government soldiers killed, however the provision of training decreases the number of government soldiers killed, as does direct support, in the form of foreign troops or direct cooperation between rebels and the external supporter. Larger rebel groups kill more government soldiers, while the size of the government army reduces the number of government soldiers that are expected to die.

Table 3.13: OLS Regressions Using Deaths for Both Sides

	Dependent variable:				
	ln(Total Deaths)	ln(Government Deaths)		ln(Rebel Deaths)	
	(1)	(2)	(3)	(4)	(5)
ln(Reb Deaths)			0.463***		
			(0.027)		
ln(Gov Deaths)					0.568***
					(0.033)
Gov Support	0.119	0.161	0.120	0.089	−0.002
	(0.094)	(0.124)	(0.106)	(0.137)	(0.118)
Reb Support	0.446***	0.215	−0.021	0.511***	0.389***
	(0.094)	(0.123)	(0.107)	(0.137)	(0.118)
ln(Gov Troops)	−0.165*	−0.225**	−0.054	−0.370***	−0.242**
	(0.065)	(0.085)	(0.074)	(0.095)	(0.082)
ln(Reb Troops)	0.511***	0.600***	0.391***	0.451***	0.110*
	(0.034)	(0.045)	(0.041)	(0.050)	(0.047)
Polity	0.008	0.018	−0.014	0.068***	0.058***
	(0.010)	(0.013)	(0.011)	(0.014)	(0.012)
ln(Population)	0.094	0.301***	0.170*	0.282**	0.111
	(0.067)	(0.088)	(0.076)	(0.098)	(0.085)
ln(GDP/capita)	0.066	0.122	−0.032	0.332***	0.263***
	(0.049)	(0.064)	(0.056)	(0.071)	(0.061)
Constant	0.608	−5.071***	−3.615***	−3.145*	−0.263
	(0.878)	(1.157)	(0.997)	(1.282)	(1.113)
Observations	861	861	861	861	861
R^2	0.258	0.193	0.405	0.177	0.393
Adjusted R^2	0.252	0.187	0.400	0.170	0.388
Residual Std. Error	1.310	1.726	1.482	1.912	1.642
F Statistic	42.343***	29.196***	72.620***	26.163***	69.022***
Note:					*p<0.05; **p<0.01; ***p<0.001

For the government, direct support from a foreign actor, as well as financial support, both increase the number of rebels killed, while all other support reduces the number of rebels killed by the government. Larger government armies kill fewer rebels, as is expected according to the deterrent theory of government troop size, while governments fighting large rebel groups are expected to kill more rebels.

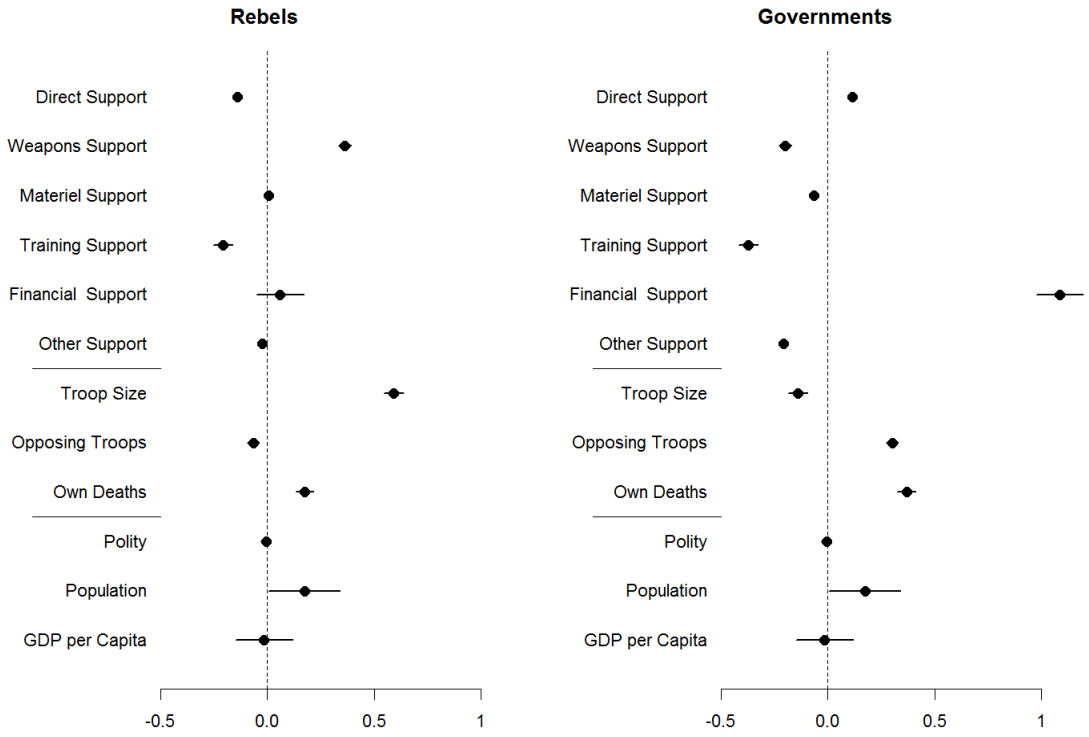

Figure 3.7: Coefficients of Effect on Deaths Inflicted on Opponent, by Actor Type

Chapter 4

The Dynamics of Duration: How Conflict Intensity Prevents Conflict Resolution

Abstract

Civil war duration has been explained as a function of wealth, inequality, ethnic divisions, foreign intervention, relative strength of rebels and governments, and even the presence of mountains. Existing studies do not, however, account for the way that wars are fought. Conflict intensity is a basic descriptor of conflict dynamics, and yet it is absent from most studies of civil war duration. By estimating the effect of conflict intensity on conflict duration, this paper improves the understanding of how the fighting within a conflict determines how long the conflict will go on. The number of battle deaths in a particular year has a strong negative effect on the likelihood of a conflict ending, with a doubling of the number of deaths causing a 28% reduction in the probability of termination.

Civil wars vary greatly in both intensity and duration. Some conflicts last less than one year, while others drag on for decades. Some kill dozens of people each year, while others kill tens of thousands. Although previous studies have sought to explain the variation in conflict duration, and others have examined the causes of intensity, there is no existing work on the effect of intensity on duration. Early quantitative studies of civil conflict looked primarily at structural variables of the country in which the conflict occurred. Newer work on conflict duration has increasingly looked within conflicts to identify aspects of rebel groups that affect how long conflicts last. This paper adds to this effort by addressing the effect of conflict intensity on duration.

Studies of conflict duration have not fully addressed the dynamics of conflicts. There have been many studies of conflict duration, but in many, observations are considered equivalent over time, despite the fact that many conflicts go through periods of both high and low intensity. Some conflicts start out at a high level of intensity and then slowly decrease until ending at a low level, while others start out small and gradually increase. Many conflicts see years of low level conflict, with one or two spikes when the fighting rises to a higher level, increasing the number of battle deaths. This variation is unaddressed in the existing literature, and this paper will help to encourage further research into the effect of conflict dynamics by demonstrating the effect of intensity on conflict duration.

Quantitative studies of civil wars often fail to address the vast differences between the many small civil conflicts that are ongoing throughout the world,

and the few large civil wars. Datasets on civil conflict are dominated by observations of small conflicts, although large wars are much more prominent in examples and theories. Testing data that is primarily composed of small conflicts, while discussing large wars presents a concern that our understanding of the most important cases for policy decisions may in fact only be valid for small conflicts. By addressing the effect of conflict intensity I seek to improve the understanding of how conflicts of varying size differ, and what implications this has for dealing with ongoing conflicts and wars.

The long duration of many civil conflicts is assumed to result from the failure of the two sides to reach an agreement on the distribution of the good in contention. I argue that conflicts end when the rebels realize, through the experience of fighting, that they will be unable to defeat the state. During a high intensity conflict both sides are unwilling to negotiate a settlement, because they are hoping to win a military victory. When conflict intensity is lower it becomes apparent to the rebels that they are unlikely to win militarily against the government, prompting them to consider reaching a political agreement. For the government, negotiating a settlement often requires giving amnesty to rebel fighters and leaders, which is politically difficult in many high intensity conflicts, when the public sees rebels as having blood on their hands. The government must also worry about these highly-capable rebels returning to conflict. In a low intensity conflict the government can avoid the cost of routing out the last elements of a hidden rebel group with fewer domestic political obstacles, and less worry about the rebels returning to conflict.

The nature of civil conflicts is such that the state is in power and has, at least notionally, control over the country. Rebels seek to gain control over territory, or to change the government itself. This puts the rebels in the position of the aggressor, while the government is in a defensive position, and seeks to prevent the rebels from taking power away from the government. In addition to this asymmetry, rebel forces are usually much weaker, and less numerous, than government armies. Governments have large numbers of military personnel and facilities to defend, as well as potential civilian targets. Many small rebel groups operate without any clearly identifiable locations for the government to target, allowing them, if they wish, to stop fighting and go into hiding, or return to civilian life. The government cannot simply stop fighting, without giving up control to the rebels.

This paper finds that as the number of battle deaths in a conflict increases, the probability of that conflict ending drops substantially. A conflict with an intensity that produces 1000 battle deaths per year has only an 8% chance of ending in any particular year. When the intensity drops to a level of 100 battle deaths per year the probability of termination more than doubles, to 18%. These results demonstrate that efforts to reduce the intensity of conflict not only save lives while the war is going on, but also increase the likelihood that a conflict will be brought to a conclusion.

4.1 Literature

There is little existing research examining the effect of conflict intensity on conflict duration. The literature has payed too much attention to how wars start and end, and not enough to how they are fought. In particular, termination cannot be understood without understanding what happens during a war. Wars are treated as homogeneous, especially in studies of conflict duration, where each additional year of conflict is seen as equivalent across conflicts, despite substantial qualitative differences in how wars are fought.

The most notable investigation on this subject is by Balcells and Kalyvas (2014), who evaluate the effect of different 'technologies of rebellion' on conflict duration. They define technologies of rebellion as conventional war, irregular war, and symmetric nonconventional (SNC) war. Although these three types of conflict are not expressly defined by the intensity of the fighting that they produce, the average intensity of conventional wars was three times that of irregular wars, which was in turn several times more than symmetrical nonconventional conflicts (Balcells and Kalyvas, 2014). Additionally, they argue that the relative balance of power between rebels and the government is what determines the war fighting strategy of both sides, and therefore the type of conflict (Kalyvas and Balcells, 2010).

Technologies of rebellion are an understudied element of conflicts, and need to be taken into account in order to understand how wars are fought. A better understanding of how wars are fought will provide a better understanding of how they can be ended. Irregular conflicts last longer than other conflicts and

although they are less intense than conventional wars, Balcells and Kalyvas (2014) find that they have higher levels of overall battlefield violence, in terms of the total number of battle deaths and civilian deaths, due to their longer durations. Conventional conflicts are shorter than irregular wars, and have higher intensity, but fewer overall deaths. SNC wars are the shortest of all, and the least intense, producing many fewer battle deaths.

Although Balcells and Kalyvas (2014) find that conventional conflicts are more intense than insurgencies, and that they are shorter, they do not differentiate between whether technology of rebellion causes a certain level of intensity, which in turn determines the duration of conflict, or whether intensity is the cause of both the technology adopted by the rebels as well as the duration of the conflict. By modeling the effect of conflict intensity directly, this paper will help to clarify this point.

The finding that irregular wars are the least deadly appears to indicate that there is a nonlinear effect of conflict intensity on duration, with high intensity conventional conflicts and low intensity symmetrical nonconventional conflicts being the shortest, while irregular conflicts have a medium level of intensity as well as the longest duration. This paper will test whether the effect of intensity on duration, which is implied by Balcells and Kalyvas (2014), is found when the effect of intensity on duration is tested directly.

Although conflict intensity is studied far less than onset and duration, there are a number of studies that have evaluated why conflicts vary in intensity. This paper will build on the existing literature on the causes of intensity by

evaluating how intensity then affects duration. The first quantitative study attempting to explain conflict intensity was Lacina and Gleditsch (2005). The creation of a dataset with annual counts of battle deaths led to a number of studies evaluating the effect of regime type (Lacina, 2006; Heger and Salehyan, 2007; Eck and Hultman, 2007), foreign intervention (Lacina, 2006; Lacina, Gleditsch and Russett, 2006), sanctions, arms embargoes and peacekeepers (Hultman and Peksen, 2015; Hultman, Kathman and Shannon, 2014), lootable resources (Wood, 2010; Lujala, 2009), and the type of rebellion (Heger and Salehyan, 2007; Eck and Hultman, 2007). The findings produced by these papers help to explain why some conflicts are more intense than others. The next step is to see how intensity affects the length of conflicts.

Conflict duration has been modeled theoretically using the bargaining model of war (Fearon, 2004). Some reasons that conflicts are thought to be difficult to end, based on bargaining failures, include when the government has an enduring economic or political interest in territory that rebels seek to gain autonomy over, or when income from lootable resources reduces the cost of conflict for rebels (Fearon, 2004). Civil wars with multiple actors are harder to end because multiple veto players must all agree, increasing information problems, and shrinking the bargaining space (Cunningham, 2006). After a long and costly war, states are less likely to go to war again, and any subsequent wars are likely to be shorter (Smith and Stam, 2004)

Another viewpoint on conflict termination argues that actors are most likely to end a conflict when they are engaged in a hurting stalemate. Actors

are receptive to negotiated settlements only after their hope for a military victory has passed, and they find themselves paying high costs to continue fighting a war that they are unlikely to win (Zartman, 2000).

The literature on conflict duration has generated many findings which may interact with conflict intensity, including the level of economic development, economic inequality, and primary commodity prices. Additionally, levels of ethnic division affect duration, and sons of the soil conflicts have been shown to last longer than others (Collier, Hoeffler and Soderbom, 2004; Fearon, 2004).

Existing studies of conflict duration have examined the effect of numerous variables, such as foreign intervention, without also including a measure of conflict intensity. By not including conflict intensity their findings may be suffering from omitted variable bias. External support to rebel groups has been shown to increase conflict intensity in Chapter 3, and it is possible that the effect of external support on duration may be working through the effect of support on intensity.

There are mixed findings on the effect of intervention into civil wars. Foreign interventions into civil conflicts have been shown to increase conflict duration[1] (Regan, 2002). It has also been shown that one-sided interventions in support of the government increase conflict duration, and interventions in support of both sides increase duration even more (Balch-Lindsay and Enterline, 2000). External support for rebels has been shown to shorten civil

[1]This finding is commonly cited as showing that biased interventions shorten wars. It actually shows that wars with biased interventions are shorter than wars with neutral interventions. There is no evidence that biased interventions shorten wars relative to wars with no intervention.

conflicts (Collier, Hoeffler and Soderbom, 2004).

External support can have different intentions. Parties to a conflict cannot credibly commit to abide by a negotiated settlement, without outside enforcement. In these cases an outside actor can help to end a conflict (Walter, 1997). This theory helps explain why diplomatic interventions have been shown to decrease duration, while military and economic interventions often increase duration (Regan and Aydin, 2006). UN peace operations have been shown to increase the success in peace building after a conflict ends (Doyle and Sambanis, 2000).

These studies evaluate the effect of foreign interventions on conflict duration, but do not take account of the intensity of the conflicts. As a result, they are including both large wars and small conflicts which share little in common, and assuming that the effect of intervention is constant across all conflicts, regardless of intensity. In Chapter 3 I demonstrated that external support increases conflict intensity, when the support is given to rebel groups. Because support affects intensity, and intensity affects duration, the effect of external support on duration cannot be properly estimated without including a measure of conflict intensity.

Studies of relative strength between rebels and governments have a similar problem. One effort to improve the study of how wars are fought comes from the nonstate actor (NSA) dataset, which was created to allow for empirical studies of how rebel group characteristics affect conflicts (Cunningham, Gleditsch and Salehyan, 2009). They include an ordinal measure of the relative

strength of rebels, compared to the government, finding that civil wars fought with relatively strong rebel groups tend to be shorter than wars with relatively weak rebels (Cunningham, Gleditsch and Salehyan, 2009). The strength of rebel groups has been shown to have a large effect on conflict intensity, raising the question of whether the effect of relative rebel strength on duration is in fact finding that relative strength affects intensity, which in turn affects duration.

Both the number of troops and the presence of external support are included in Sawyer, Cunningham and Reed (2017). They show that fungible sources of support, such as financial support and arms transfers increase the duration of conflicts, while also controlling for the number of soldiers in both the state and rebel armies. They find that larger rebel armies fight longer wars, and that both external support and troop size are determinants of conflict duration, however they do not include a measure of conflict intensity. This paper will test the effect of support and troop size, as well as the effect of intensity.

Although there is no existing literature explicitly testing the effect of battle deaths on conflict duration, intensity has been included as a control variable. Cunningham (2010), while modeling how the intentions of foreign states intervening in a conflict affects duration, found that as the number of battle deaths in a conflict increases the likelihood of the conflict ending decreases. This measure of conflict intensity was included as a control variable, and was not explicitly theorized, beyond a baseline expectation that more intense conflicts were expected to be shorter. That study was done at the conflict level, grouping

multiple rebel groups together against a single state. Conflicts with multiple actors appear more intense than conflicts at the dyadic level. When there are multiple veto players in a civil war there are fewer acceptable agreements, more information asymmetries, and shifting alliances and incentives to hold out for a better deal make agreement more difficult to achieve (Cunningham, 2006). This could cause multiparty wars to both be more intense and last longer. Testing this effect at the dyadic level will provide another test of the effect of conflict intensity on duration, and allow for a more granular estimate of how individual rebel groups behave.

4.2 Theory

Conflicts end either through negotiated settlements, through a military victory by one side or the other, or by a rebel group unilaterally ceasing to fight. A military conclusion to a conflict is most likely when there is a dynamic military interaction between the two sides, presenting opportunities for one side to defeat the other with a decisive victory. Negotiated settlements are most likely when both actors in the conflict see a military conclusion as unlikely. The other possible conclusion to a conflict occurs when a rebel group slowly fades away, launching fewer attacks, and killing fewer people, over a long period of time. These conflicts end with low levels of battle deaths, after a period of several years of low deaths.

Bargaining models have been used to explain conflict onset (Fearon, 1995),

as well as duration (Fearon, 2004). According to bargaining model explanations of conflict duration, more intense civil conflicts should have higher costs for both the government and the rebels, which will increase the size of the bargaining range, increasing the number of possible bargains that both sides would prefer to continued fighting (Filson and Werner, 2002; Powell, 2004; Walter, 2009). Additionally, intense fighting should increased the amount of information both actors have about the capabilities of the other side, as well as their own abilities. This is argued to reduce the information problem which has been argued to contribute to bargaining failures.

I argue that high intensity does not solve the information problem, but instead increases uncertainty. In a high intensity conflict the fortunes on the battlefield can be hard to predict. A single battle can sometimes shift the outlook of a war, such that actors are uncertain about what will happen if they continue to fight. Even after a series of lost battles, the losing actor may be able to succeed, and achieve victory. This uncertainty about their probability of victory, combined with the problems associated with negotiating settlements in a civil conflict, makes it more difficult for actors in an intense civil war to reach an agreement to end a conflict.

Conversely, when conflict intensity is low, the information available to actors is much better. Small rebel groups that are fighting low intensity conflicts know with a high level of confidence that they will not be able to defeat the government, at least not without investing many years of effort into developing a larger military force. Small rebel groups therefore have higher levels of

information about their poor military position, and have a clear view of the high cost that they will have to bear, in the form of a multi-year effort to grow their organization, before they will be able to present a credible challenge to the government. Small rebel groups that understand their poor position will therefore be more likely to accept a peace deal, or to unilaterally decide to give up the fight rather than continue to struggle for a goal that is highly unlikely to be attainable.

Dynamic military interactions leading to decisive victory are characterized by situations of intense combat, producing large numbers of battle deaths. In these cases, it is possible for both the rebels and the government to decide to continue fighting based on a reasonable belief that they may be able to defeat their opponent if the conflict continues.

Rebels who are fighting high intensity conflicts against the government can hope that the military situation will change suddenly, through a surprise victory on the battlefield. If the conflict is attracting outside attention they can hope for external support that will provide them with new capabilities. They can also hope for a shift in public opinion among their potential supporters, which could turn the tide in their favor. They can also hope that the government will change. A new elected government, or a collapse of the government due to some other factor, can change the willingness of the government to continue paying the costs of conflict. In all of these cases a rebel group that is involved in intense fighting will avoid making a settlement with the government because their level of uncertainty regarding the outcome of the military

contest is high. As long as there is hope that they could win outright, settling for a partial victory is an unattractive prospect.

Similarly, the government has little incentive to settle with a rebel group when conflict intensity is high. Governments often interpret high levels of battle deaths as progress in the fight to eliminate rebels. Politically, the public is often unwilling to accept a negotiated settlement with a rebel group if that agreement involves amnesty for the rebels. If the agreement does not include amnesty, it is unlikely that the rebels would be willing to agree to it.

When intensity is high the capability of the rebels to fight is clearly apparent, and it is difficult for the rebels to credibly commit to not return to conflict after reaching an agreement. Rebels that have high capabilities, and have demonstrated their ability to use them to wage costly combat against the government, will be unwilling to disarm, and the government, and the public they represent, will be unlikely to allow a dangerous armed group to remain armed.

Actors are unlikely to agree to a negotiated bargain to a conflict that they believe they could win outright. If, on the other hand, they have been fighting for a long period of time, and recognize that there is little chance for an outright victory, they are more likely to settle for a negotiated bargain. High intensity therefore prevents conflicts from ending, by allowing for a belief that victory is possible. Conversely, when intensity is low, the rebels have little hope of a military breakthrough, and can therefore make a bargain to end the conflict. Although small-scale insurgencies are unlikely to overthrow governments, they

are also very difficult for many governments to defeat completely. The cost for a government of settling a low-intensity conflict with a small rebel group is often much lower than continuing to fight.

Rebel groups that are involved in a low intensity conflict may also decide to stop fighting without reaching an agreement with the government. When the probability of the rebels winning becomes too low, they are unable to make any agreement with the government, as the bargaining range goes into the negative range. Ceasing to fight, without an agreement with the state, is equivalent to a bargain where the government receives the entire good in question. This situation equates to a corner solution to the bargaining model (Cunningham, 2016).

Hypothesis 9 *High levels of conflict intensity make conflict termination less likely*

Are low intensity conflicts more likely to end quickly, or are conflicts with small rebel groups more likely to end quickly? It has been argued that conventional conflicts, with rebels who are capable of directly confronting the government are likely to be shorter (Balcells and Kalyvas, 2014). It has also been argued that relative strength between rebels and governments decreases conflict duration (Cunningham, Gleditsch and Salehyan, 2009). However, in Chapter 2 I showed that the size of rebel groups affects conflict intensity, which opens the possibility that these previous studies conflated the strength of rebels with the intensity of conflict. Larger rebel armies should increase the intensity of a conflict, reducing the probability of conflict termination.

Conversely, when the government army is large, it should decrease intensity, making conflict termination more likely.

Hypothesis 10 *Larger rebel armies makes conflict termination less likely*

Hypothesis 11 *Larger government armies makes conflict termination more likely*

Another factor commonly associated with increased conflict duration is external support. Previous studies have looked at the effect of external support outside of the mechanism through which the support affects conflict intensity, and have shown that external support to rebel groups increases conflict duration (Regan, 2002; Cunningham, 2010). Chapter 3 shows that external support increases the intensity of conflicts, which will decrease the probability of termination, and in turn lead to longer conflicts.

Hypothesis 12 *External support to rebel groups makes conflict termination less likely*

4.3 Data

To test the effect of conflict on external support I use data from the Uppsala Conflict Data Program (UCDP). UCDP records data on the use of armed force, including both small and large conflicts. This allows for a comparison of high intensity dyads, such as the Government of Ethiopia fighting the Eritrean

People's Liberation Front, which killed 30,633 people in 1990, with low intensity dyads, such as the Government of Ethiopia fighting the Ogaden National Liberation Front, which has averaged only 53 deaths per year, over 23 years of fighting. To be included in UCDP a dyad must produce at least 25 battle deaths within a calendar year, and must include an organized opposition group fighting against a government, with the goal of altering the government or gaining control over territory (Wallensteen and Sollenberg, 2001).

In order to have the most precise conflict intensity data available at the dyadic level, I used the UCDP Georeferenced Event Data (GED), which records individual conflict events, including the location and date of an event, as well as the number of people killed. GED records deaths in one of three categories: battle deaths, one-sided violence, and non-state violence. Of primary interest to this analysis is battle deaths, which are deaths resulting from armed combat between two actors. Battle deaths includes combatants who die in fighting, as well as civilians who are killed as a byproduct of fighting between actors. Despite the detailed temporal data, because all the control variables are recorded annually, I have aggregated the GED data to the yearly level. GED begins in 1989, and ends in 2016, with global coverage (Sundberg and Melander, 2013).

UCDP GED only includes dyads that at some point produce more than 25 deaths in a calendar year. If they reach this threshold, deaths are recorded in other years, even if they are below the 25 death threshold. This allows for an improved duration analysis, as very low intensity periods are still coded as active conflict periods, rather than as termination. This avoids conflating

conflicts that have fallen below an arbitrary threshold, and may flare up again in subsequent years, with conflicts which have ended completely.

To ensure that including dyad-years with fewer than 25 deaths are not determining the results, I have also run the analysis including only years listed in the UCDP Conflict Termination Dataset (Kreutz, 2010). The termination dataset codes a dyad as terminating whenever the following year does not produce at least 25 battle deaths. Because it ignores dyad-years with less than 25 battle deaths, it codes more observations as conflict termination, and includes fewer observations of non-termination.

The number of annual battle deaths is highly skewed. Some dyad-years have extremely large battle death counts, with a maximum of 30,633, however the mean is only 445 battle deaths, and over half of all observations are less than 100. Because of the highly skewed nature of battle deaths, the variable is logged in all analyses.

Table 4.1: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Battle Deaths	1,946	441.091	1,465.832	1	30,633
Gov Support	1,497	0.530	0.499	0.000	1.000
Reb Support	1,497	0.317	0.465	0.000	1.000
Gov Troops	1,882	576,274.900	816,424.500	0.000	3,047,000.000
Rebel Troops	1,807	6,247.049	11,099.390	30.000	97,000.000
Polity	1,946	2.091	5.852	−9	10
Population	1,946	198,771,476.000	379,577,547.000	390,643	1,324,655,000
GDP/capita	1,946	4,417.160	8,370.420	57.477	51,722.100

In order to determine whether the effects of conflict intensity on duration

are direct effects, or if the effect of intensity is actually the result of underlying factors, I also include controls for the size of the rebel and government forces, as well as for external support. Additionally, I include regime type, population, and GDP per capita, as they have all been shown to be significant in other studies.

Data on the size of the rebel forces comes from Aronson and Huth (2017). The data consists of dyad-year observations of the number of soldiers on each side. The distribution of both variables is skewed, with rebel groups averaging 7,711 fighters, despite a maximum 97,000, while governments average 619,686, with a maximum 3,047,000. The troop size variables for both government and rebels are logged in all analyses.

In the observed data, troop levels are relatively stable for most governments and rebel groups. When troop numbers change, they usually make incremental changes over several years. In many cases troop levels remain stable for many years. There also was a high degree of missing values, accounting for 40% of all cases for rebels and 23% for government forces. The predictability, and slow rate of change in troop levels allows for a high level of confidence in imputed values. Missing observations are estimated by linear interpolation from the previous value to the next value. Missing observations before the first observation, or after the last observation, are assumed to be equal to the first or last observation, respectively. The only missing values that remain for troop numbers are for seven governments and 39 rebel groups, who have

no non-missing observations[2]. Government troop values were imputed for 389 observations, while rebel forces were imputed for 642 observations

To control for assistance given to the rebels or the government I use the UCDP External Support Dataset. It provides data on whether the government or rebels received external support in a particular year, from 1975 to 2009 (Høgbladh, Pettersson and Themnér, 2011). Rebel groups receive external support in 32% of the observations, while governments receive external support in 53% of the observations

The data covers the years 1989 to 2016, with the exception of regressions including external support, which ends in 2009. In total there are 343 dyads in the dataset, consisting of 316 rebel groups, and 83 governments.

There is large variation in the duration of conflicts. There are 68 dyads that only include a single year, while 5 dyads experience conflict throughout the entire time span of this study. In the first year of the dataset there are 68 dyads, many of which are left-censored cases that began before 1989, and were ongoing when this dataset began. Additionally, there are 76 right-censored dyads that are ongoing in 2016, and therefore do not experience termination. Additionally, there are 230 dyads that last 5 years or less, which accounts for 548 of the observations in the dataset. There are only 39 dyads that last at least 15 years, however these long conflicts account for 830 dyad-years.

[2]The seven countries are Comoros, DR Congo, Jordan, Kenya, Romania, Serbia, Solomon Islands, and Yemen. The 39 rebel groups account for 195 observations.

4.4 Analysis

The central focus of this analysis is the effect of conflict intensity on conflict termination, however, a secondary focus is determining whether intensity itself it causing some wars to be long, and others to be short, or if the underlying causes of intensity are also determining the length of conflicts. The size of the rebel and government armies, which has been shown to determine conflict intensity in Chapter 2, as well as the presence of external support, which is discussed in Chapter 3, have been included in order to test this.

To estimate the effect of conflict intensity on conflict termination, while also accounting for the effect of time, I have used logistic regressions with linear, squared and cubic time variables included. The time variables count the number of years since the beginning of the conflict, and by squaring and cubing time, it allows for an estimate of the effect of intensity on termination while also controlling for the effect of time itself. This corrects for the possibility of correlation between intensity and time. Intensity often changes over time, with many conflicts starting out large, and then slowly decreasing in intensity over time. The probability of termination has been shown to decrease over time (Cunningham, Gleditsch and Salehyan, 2009), which could lead to a spurious finding that low-intensity conflicts are less likely to end, when really that finding would be determined by the fact that longer conflicts have many low-intensity years.

Table 4.2 shows the results of logistic regressions predicting the probability of conflict termination by dyad-year. Model 1 shows that the logged count

of battle deaths has a statistically significant effect on termination, with a negative effect, supporting Hypothesis 9. The odds ratio from the coefficient is 0.76, meaning that a one unit increase in logged battle deaths reduces the probability of conflict termination by 24%, however, because battle deaths are logged, the effect of each additional death on the probability of termination is hard to estimate from the odds ratio itself.

This analysis was repeated using the UCDP Conflict Termination Dataset, which uses a higher threshold for conflict termination of 25 battle deaths, resulting in more conflict terminations, and shorter durations. The results of this analysis are shown in the appendix, in Table 4.4, and show similar results. Battle deaths remain highly significant, and the only meaningful difference is an increased significance for the number of rebel troops, which becomes significant in all models.

To better illustrate the substantive effect, figure 4.1 shows the predicted probability of conflict termination at all levels of conflict intensity observed in the data, using the estimates from model five, which includes all variables except those for external support, which were omitted because they limit the time frame of the analysis. Battle deaths are graphed on a logarithmic scale, but labeled with actual counts. Very low numbers of battle deaths are highly correlated with termination. Dyad-years with 25 deaths have a 0.27 probability of terminating that year. At 100 battle deaths the probability drops to 0.18, at 1,000 it is 0.08, and for the highest dyad-years, at 10,000 battle deaths the probability of termination is only 0.03. The differences between all of those

Table 4.2: Logit Models of Conflict Termination

	Dependent variable:				
	Termination				
	(1)	(2)	(3)	(4)	(5)
ln(Battle Deaths)	−0.273***	−0.296***	−0.321***	−0.332***	−0.394***
	(0.030)	(0.044)	(0.045)	(0.046)	(0.038)
ln(Gov Troops)		−0.294***	−0.044	−0.028	−0.052
		(0.042)	(0.088)	(0.089)	(0.056)
ln(Reb Troops)		0.044	−0.047	−0.034	−0.025
		(0.049)	(0.053)	(0.053)	(0.045)
Gov Support		−0.102	−0.058	−0.057	
		(0.134)	(0.140)	(0.141)	
Reb Support		−0.294	−0.341*	−0.355*	
		(0.169)	(0.172)	(0.173)	
Polity			−0.018	−0.015	−0.014
			(0.014)	(0.014)	(0.013)
ln(GDP/capita)			−0.231*	−0.222*	−0.176**
			(0.093)	(0.093)	(0.066)
ln(Population)			−0.296***	−0.284***	−0.228***
			(0.068)	(0.068)	(0.055)
t				0.067	−0.062
				(0.107)	(0.070)
t2				−0.015	0.002
				(0.013)	(0.007)
t3				0.001	−0.00001
				(0.0004)	(0.0002)
Constant	−0.074	3.320***	7.211***	6.815***	6.225***
	(0.120)	(0.632)	(1.314)	(1.332)	(1.085)
Observations	1,946	1,411	1,411	1,411	1,785
Log Likelihood	−1,036.448	−713.045	−694.419	−691.314	−888.853
Note:					*p<0.05; **p<0.01; ***p<0.001

estimates are statistically significant. These results indicate that the intensity of fighting in a particular dyad-year has a very large impact on the probability that a conflict will in fact end that year. When the two actors in a dyad fight intensely, the probability of termination is low, in that particular year. It is unlikely that actors will go from intense combat directly to peace, and far more likely that an intense year of combat will be followed by more combat, and the conflict will end after combat has been reduced to a lower level of intensity.

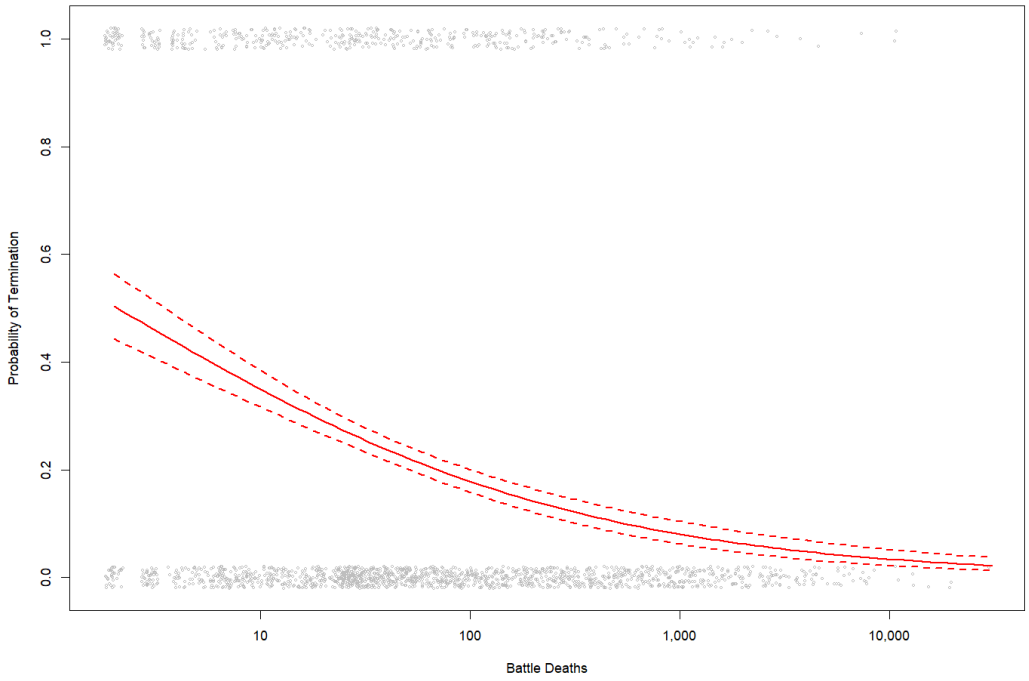

Figure 4.1: Estimated Probability of Conflict Termination by Conflict Intensity

The number of annual battle deaths negatively affects the probability of

conflict termination, so that larger conflicts are less likely to end even when controlling for lagged battle deaths. In unreported regressions, when controlling for lagged battle deaths, with up to 5 lags, only the present year is significant at predicting the end of a conflict. When the current year is omitted from the regression, the first lag is significant, indicating that the most recent information available about conflict intensity is the most meaningful for predicting conflict termination, rather than the level of intensity at earlier points.

To further investigate the time dependence within conflicts, a nonlinear effect of duration on termination can be estimated. Many conflicts last just one or two years, while those that go beyond that point often have much longer durations. This creates a duration effect on the probability of conflict termination. The probability of termination in the first year of a conflict is 0.26, while a conflict that has been ongoing for 20 years has a probability of termination of 0.17. The effect of time is statistically significant (p=0.019), as estimated from an asymptotic likelihood ratio test comparing model five to an otherwise identical model that omitted the time polynomial terms. The effect of duration on the probability of a conflict ending in a given year, as estimated by the time polynomial in model five, is shown in figure 4.2. The graph shows that although decreasing over time, the effect is relatively modest, and the statistically significant finding is limited to comparing conflicts that are one or two years old to conflicts that have been ongoing for more than a decade. There is no discernible difference in the probability of termination for

conflicts that have been ongoing for more than a few years. By including a control for time in the regression of intensity on termination the possibility of a spurious finding resulting from a correlation between the age of a conflict and the intensity of the fighting is avoided.

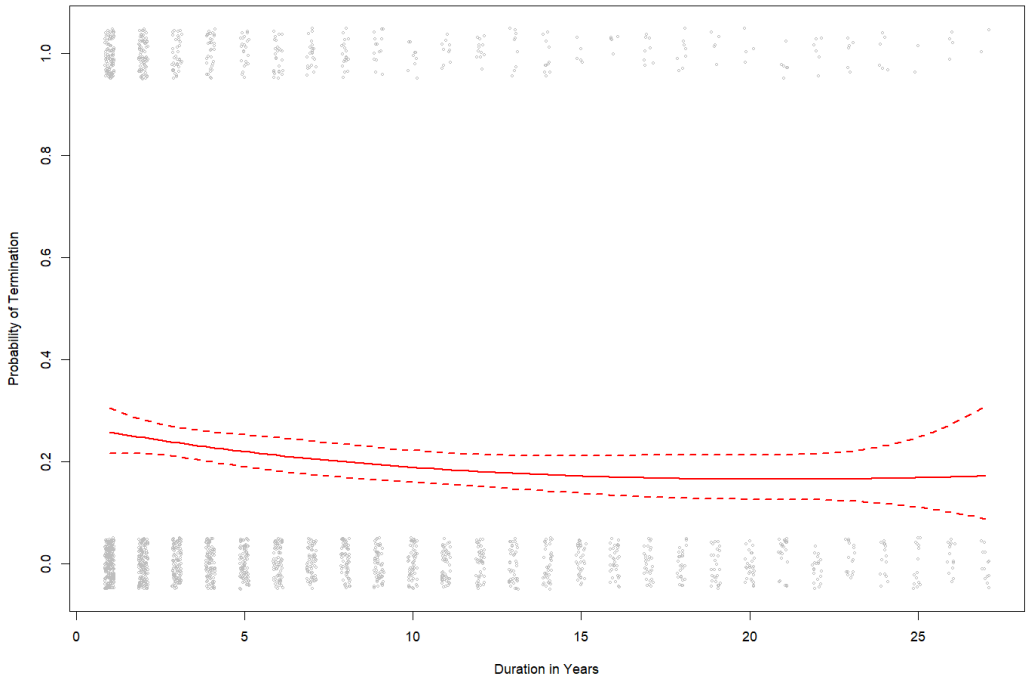

Figure 4.2: Predicted Probability of Conflict Termination Over Time

In order to determine whether conflict intensity is directly affecting termination, or whether it is a spurious relationship caused by the determinants of intensity, I have included variables for troop size and external support. Conflict intensity is highly related to the number of soldiers involved in the conflict, and in particular to the number of rebel soldiers. External support has also

been shown to increase conflict intensity. By including the number of soldiers in both the rebel and government armies, as well as a binary variable indicating whether either side received external support, I have controlled for the primary determinants of conflict intensity. The remaining effect of intensity on termination shows that the number of battle deaths is still significant.

The size of rebel forces has been shown to have a large effect on the number of battle deaths in a dyad, as discussed in Chapter 2, and external support to rebel groups also increases intensity, as shown in Chapter 3. Regressing the size of the government and rebel armies against conflict termination, without other independent variables, shows that large government armies make conflict termination less likely, while the size of rebel armies is only significant at the 0.1 level, although also negative. This indicates that without controlling for other factors, larger militaries should fight longer wars. When these variables are included, along with the number of battle deaths, in a regression on conflict termination, both battle deaths and the number of government troops are significant, although the effect of government troops is not robust to the inclusion of other control variables, and appears to be picking up the effect of the population of the state, since the size of the government army and the population of the country are closely related. This result appears to indicate that the intensity of the fighting is what matters, rather than the size of the armies. Therefore, it should be equally likely for two large armies fighting at a relatively low intensity, given their size, to reach a resolution to their conflict as it is for two smaller forces that are at the same absolute intensity, even

though they are at a higher intensity relative to the size of their forces.

External support to rebel groups is significant in most models, with the exception of the restricted model only including battle deaths, troops size, and support. It is negative across all models. Battle deaths are also significant in all models, indicating that external support may prolong conflicts both by increasing conflict intensity, as well as through a separate mechanism. Including external support to rebels does not weaken the effect of intensity on duration, but does provide another significant indicator of why some conflicts are so hard to end. In model four the effect of external support to a rebel group reduces the probability of termination by 30%, in addition to the effect of conflict intensity.

The control variables, for regime type, GDP per capita, and population of the country, do not appear to have any effect on the effect of battle deaths on termination. Although GDP per capita and population are both significant, the only discernible effect of including these controls is that the effect of government troops falls out of significance. In unreported regressions, the inclusion of both population and GDP per capita is necessary to cause the effect of government troops to fall out of significance. Government troops is robust to the inclusion of either of those variables individually.

In a regression of control variables on conflict termination, without other independent variables, logged population and logged GDP per capita are highly significant and negative, indicating that larger countries, and richer countries, are less likely to experience conflict termination, and should therefore experi-

ence longer wars. Regime type is only significant in unreported models that omit GDP per capita. The two variables for external support are not significant predictors of conflict termination, when tested without other independent variables.

4.4.1 Cox Duration Analysis

Cox models examine the effect of independent variables on duration directly, rather than analyzing the effect of variables on the probability of termination in a given year. The Cox model is a proportional hazards model, meaning that it estimates a baseline hazard rate, as well as how that hazard rate varies as a result of covariates. At each value of time the model estimates the effect of covariates on conflict termination, comparing dyads that are at the same duration. Hence, the effect of conflict intensity on termination is estimated for all conflicts in their first year, as well as all conflicts in their second year, and so on. Values of covariates cause proportionate scaling of the baseline hazard rate (Box-Steffensmeier and Jones, 2004).

Table 4.3 reports the results of cox regressions. The results are similar to those for the previously reported logistic regressions. Battle deaths are a highly significant predictor of conflict duration in all models. Government troops remain significant in model 7, but not in models that include country-level control variables. The cox models do show significant results for the number of rebel troops, which were not significant in the logistic models. Rebel troop size continues to have a negative value, indicating that larger rebel armies do

lead to longer conflicts, even when accounting for the intensity of the conflict, which is in large part a function of rebel troop size. Regime type shows marginal significance, when accounting for external support, with more democratic countries experiencing longer wars. GDP per capita and population size continue to be significant negative predictors of conflict termination.

The reported coefficients can be substantively interpreted by converting them to hazard ratios. A hazard ratio is the ratio of hazards for two observations which differ by a one unit difference on that variable, when all other covariates are held constant, and is calculated by exponentiating the Cox coefficient. Battle deaths in model 9 have a hazard ratio of 0.81, indicating that a one unit increase in the logged number of battle deaths decreases the probability of termination in any particular year by 19%.

The cumulative effect of this annual effect can be seen in Figure 4.3, which shows the probability of a conflict continuing for a given number of years. The graph shows the different probabilities over time for low intensity conflicts and high intensity conflicts. The low intensity predictions are estimates of conflict survival with a conflict intensity at the first quartile, with 34 deaths per year[3], while the high intensity predictions are based on conflicts at the third quartile of average conflict intensity, with 330 deaths per year[4].

The predictions for low intensity conflicts are consistently lower than for

[3]Conflicts with an average of 34 deaths per year include the government of Iran fighting the Democratic Party of Iranian Kurdistan (DPIK), or the Government of Papua New Guinea against the Bougainville Revolutionary Army (BRA).

[4]This level of intensity corresponds to the conflict between the Government of Algeria and Al-Qaeda in the Islamic Maghreb (AQIM), or between the Government of Uganda and the Lord's Resistance Army (LRA).

Table 4.3: Cox Survival Model of Conflict Duration

	Dependent variable:			
	Termination			
	(6)	(7)	(8)	(9)
ln(Battle Deaths)	-0.137^{***}	-0.174^{***}	-0.196^{***}	-0.205^{***}
	(0.025)	(0.038)	(0.039)	(0.030)
ln(Gov Troops)		-0.371^{***}	-0.102	-0.079
		(0.036)	(0.073)	(0.058)
ln(Reb Troops)		-0.010	-0.110^{*}	-0.080^{*}
		(0.041)	(0.044)	(0.038)
Gov Support		-0.124	-0.021	
		(0.113)	(0.115)	
Reb Support		-0.109	-0.168	
		(0.152)	(0.150)	
Polity			-0.024^{*}	-0.018
			(0.012)	(0.011)
ln(GDP/capita)			-0.262^{**}	-0.267^{***}
			(0.080)	(0.066)
ln(Population)			-0.338^{***}	-0.329^{***}
			(0.058)	(0.051)
Observations	1,946	1,411	1,411	1,785
R^2	0.016	0.092	0.139	0.120
Max. Possible R^2	0.964	0.953	0.953	0.960
Log Likelihood	$-3,214.102$	$-2,085.400$	$-2,048.209$	$-2,767.674$
Note:				*p<0.05; **p<0.01; ***p<0.001

high intensity conflicts, and statistically significant in all but the first year and the last two years of the period, when the confidence intervals increase. The lower probability of conflict termination for low intensity conflicts means that after ten years 80% of high intensity conflicts are ongoing, while only 74% of low intensity conflict continue past ten years. 56% of high intensity conflicts last for 25 years, while only 45% of smaller conflicts will last 25 years.

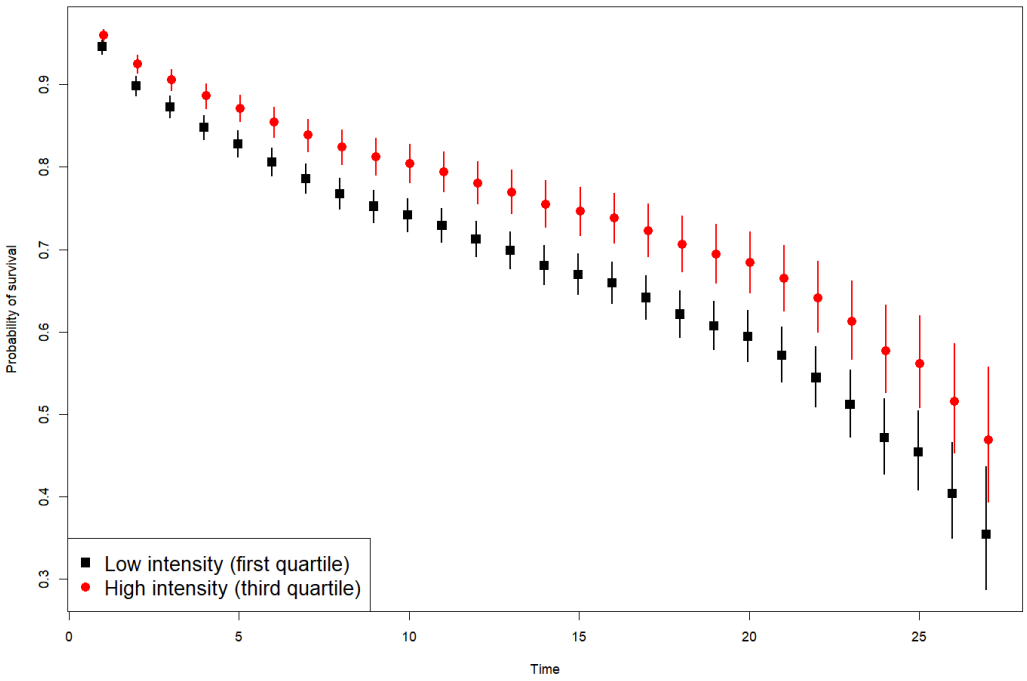

Figure 4.3: Probability of Survival, by Conflict Intensity

4.5 Examples

The Lord's Resistance Army (LRA) terrorized much of Uganda for over two decades, starting in 1987. Although much of the violence of the LRA was targeted towards civilians, they also fought against the Ugandan government, with battle deaths routinely passing 1000 deaths per year. There was a first attempt at negotiations in 1994, and then a short unilateral ceasefire declared by the LRA in 1996 around an election that they were hoping would unseat President Museveni. Conflict intensity peaked in 2004, at 1610 battle deaths. The next year it fell to 695, and the next it fell to 221. That year the LRA, which had largely been pushed out of Uganda and increasingly realized they would not be able to defeat the government, agreed to enter negotiations. From 2006 to 2008 there were several meetings between the government and the LRA, meeting in what is now South Sudan. A truce was established, and the LRA moved their forces to two bases in DRC, as a preliminary step towards a peace agreement and eventual demobilization. The negotiations failed however, and the governments of Uganda, DRC, and South Sudan later attacked those camps in late 2008.

By 2012 the LRA had fallen to just a few hundred fighters, and the Ugandan government led an African Union force of 5,000 troops to search for the remnants of the LRA over the territory of four countries. From 2010 to 2016 the fighting between the government and the LRA averaged only 33.8 battle deaths per year. In 2017 the Government of Uganda declared that they were no longer looking for the LRA. Although Joseph Kony was still at large, the

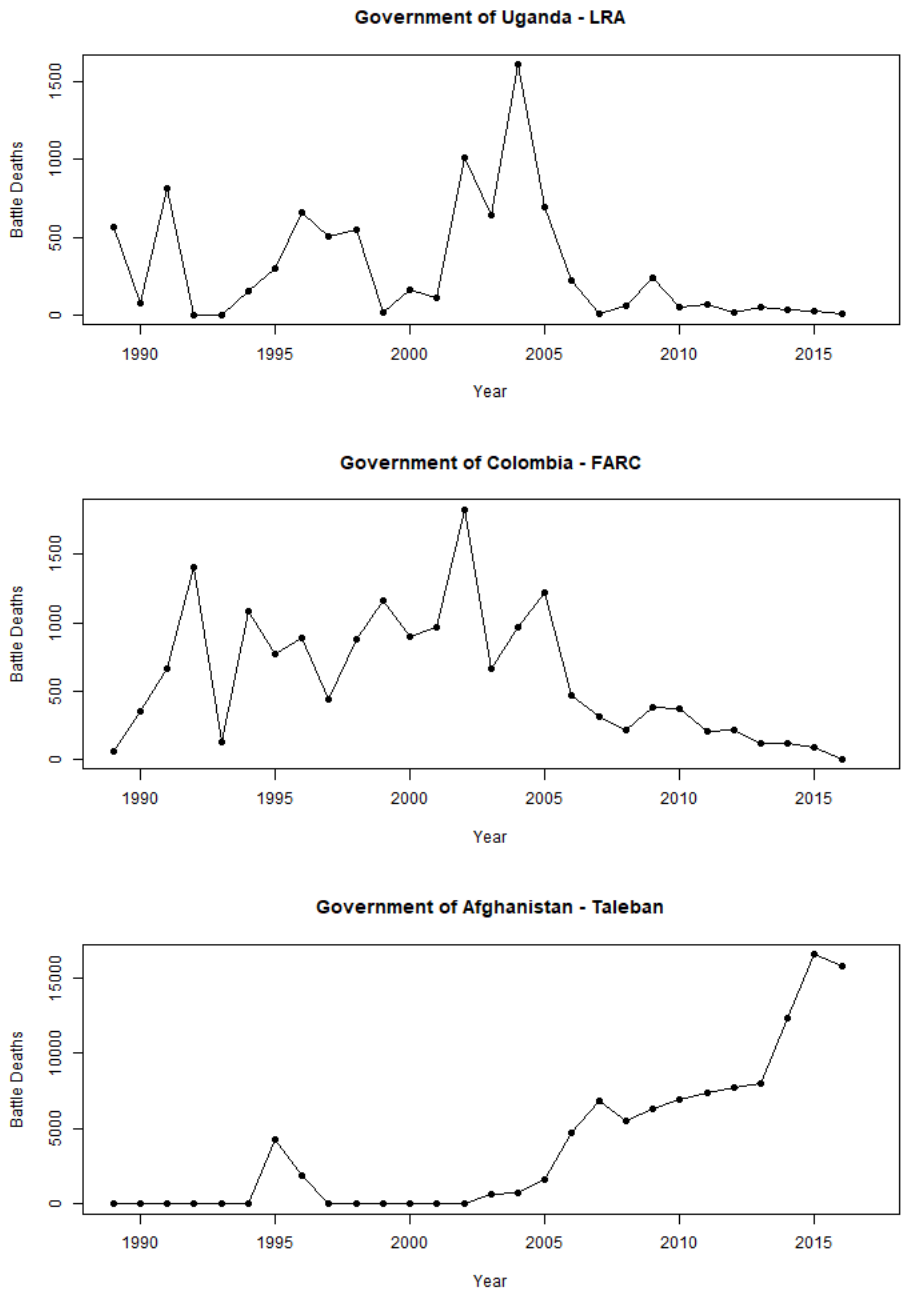

Figure 4.4: Examples of Conflict Deescalation Leading to Termination

LRA was no longer operating in Uganda, and had grown so small and weak that the government of Uganda considered the conflict over. This example serves to show that a conflict like that between Uganda and the LRA could not end over the decades when the LRA was a capable fighting force, but instead ended after several years of very low intensity conflict, when the LRA decided to flee to safe havens in the DRC and Central African Republic rather than attempt to fight the government of Uganda directly.

The Revolutionary Armed Forces of Colombia (FARC) present an example of a powerful rebel group that only made peace with the government after the intensity of the conflict fell to a low level. Although the FARC had operated for over 50 years in Colombia, with battle deaths frequently passing 1000 per year, in the last 10 years it averaged only 200, and fell steadily from 468 in 2006 to just 84 in 2015. This steady decline in their military fortunes forced the FARC to accept that they no longer had the capability to confront the state militarily, and instead had to negotiate an end to the conflict. In 2016 the FARC agreed to a ceasefire, and in 2017 they officially ended their armed struggle against the government and engaged in legal political activity

In Afghanistan, the conflict with the Taliban has gradually increased over time. In the early years after the Taliban was removed from power there were hundreds of deaths per year attributed to fighting between the government and the Taliban. That number increased steadily until by 2015 it had passed 15,000 battle deaths per year. The Taliban today continues to control large portions of Afghanistan and maintains a large fighting force capable of engaging in large

scale combat against the government. There have been attempts to negotiate an end to the conflict. In 2009 President Hamid Karzai called for negotiations, and in 2013 the Taliban established an office in Qatar to facilitate negotiations with the Afghan government, as well as the United States. There is, however, no evidence that a negotiated settlement will be reached while the Taliban is still strong enough to pose a real threat to the government in Kabul.

4.6 Conclusion

Conflict intensity has a strong effect on conflict duration. When intensity doubles, the probability of a conflict ending decreases by 28%. Small conflicts, with less than 100 battle deaths per year have high probabilities of ending, of over 20% per year. Large conflicts, with more than 1000 annual deaths are very unlikely to end, with an annual likelihood of less than 8%. This is an important finding for quantitative research on conflict duration, as the effect of conflict intensity has been understudied, and many studies are reaching conclusions about conflicts generally, when the research may be more correctly framed as a discussion of either small conflicts or large wars.

Omitting conflict intensity, and thereby comparing many qualitatively different conflicts to each other, may have prevented many studies of conflict duration from producing important results. Many effects may be predicted to have different effects for small conflicts and large wars. A theory that is constructed with large civil wars in mind, but tested on a dataset of primarily

small conflicts, may reach incorrect conclusions, or fail to find any significant results. By including conflict intensity in both theoretical and empirical efforts, future studies of conflict duration will be improved.

This paper also has important substantive findings. Conflicts do not go from intense combat directly to peace. Efforts to reduce the intensity of fighting will help to reduce the death toll of war in the short term, but will also reduce the length of conflicts. By reducing the harm of a conflict, and bringing it to peace more quickly, the overall harm caused by conflicts can be reduced. Peacekeeping and other conflict mitigation techniques are therefore not only useful in reducing deaths in the short term, but may cause conflicts to end earlier.

4.7 Appendix

The results shown in the main analysis are repeated here, using the UCDP Conflict Termination Dataset to define when a conflict ends. This analysis produces similar results to the analysis reported in the body of the paper. UCDP defines termination as a dyad-year with at least 25 battle deaths that is followed by a dyad-year with less than 25 battle deaths. This contrasts with the definition used in the body of the paper, where termination was defined as a dyad-year with a positive number of battle deaths, followed by a year with zero battle deaths.

Table 4.4 shows that the effect of battle deaths on termination remains significant and negative for all models, as shown in the body of the paper. The magnitude of the effect increases slightly for all models. The effect of government troops remains significant for model two, but not for the models that include population. A notable difference using the UCDP termination data is that the size of the rebel forces has a significant effect across all models, whereas it is not significant in any of the models using zero deaths to indicate termination. This presents the possibility that, although battle deaths have a large effect, the size of the rebel army may also matter, with the least likely case for termination being a high intensity conflict with a large rebel army. When compared with the main analysis, this means that small rebel groups that fight intense conflicts are more likely to reach termination than a larger group that produces the same number of deaths from combat.

External support to rebel groups is significant across all models, while gov-

ernment support remains insignificant in all models. This is largely consistent with the findings in the original analysis, with the exception of increased significance in model two. This shows that while conflict intensity is a strong factor in determining the duration of a conflict, the characteristics of the rebel group that have been shown to affect intensity also have a separate effect on duration, outside of their effect on intensity.

Figure 4.5 shows the predicted probability of termination given varying levels of battle deaths. The results are largely consistent with the results shown in Figure 4.1, with the noticeable difference that Figure 4.5 starts at 25 battle deaths, due to the restriction from the UCDP termination dataset. Additionally, the predicted probabilities reported here are slightly higher than the original predictions, at all values, do to the increased number of terminations in the UCDP termination dataset, which reports a higher number of conflict periods, as a result of their higher threshold for the number of deaths necessary for a conflict period to continue.

Model 5 predicts that a dyad-year with 25 battle deaths has a 46% probability of ending that year, which drops to 33% at 100 battle deaths, 16% at 1,000 battle deaths, and just 7% for dyad-years with 10,000 battle deaths. The estimates at each of these levels are statistically significant when compared to each other.

Figure 4.6 presents similar results to those shown in the main analysis in Figure 4.2, however with a somewhat larger effect. The predicted probability of termination for the first 4 years is significantly higher than the probability of

Table 4.4: Logit models of conflict termination, using UCDP termination

	Dependent variable:				
	UCDP Termination				
	(1)	(2)	(3)	(4)	(5)
ln(Battle Deaths)	-0.431^{***}	-0.349^{***}	-0.340^{***}	-0.335^{***}	-0.404^{***}
	(0.048)	(0.059)	(0.060)	(0.060)	(0.057)
ln(Gov Troops)		-0.225^{***}	0.017	0.029	-0.067
		(0.047)	(0.099)	(0.100)	(0.074)
ln(Reb Troops)		-0.176^{**}	-0.235^{***}	-0.192^{**}	-0.171^{**}
		(0.058)	(0.061)	(0.063)	(0.057)
Gov Support		-0.130	-0.142	-0.111	
		(0.150)	(0.153)	(0.155)	
Reb Support		-0.312^{*}	-0.338^{*}	-0.357^{*}	
		(0.152)	(0.153)	(0.155)	
Polity			-0.0003	0.006	-0.003
			(0.016)	(0.016)	(0.015)
ln(GDP/capita)			-0.256^{*}	-0.227^{*}	-0.120
			(0.103)	(0.104)	(0.084)
ln(Population)			-0.142^{*}	-0.126	-0.063
			(0.073)	(0.073)	(0.065)
t				-0.019	-0.111
				(0.136)	(0.099)
t2				-0.010	0.001
				(0.019)	(0.012)
t3				0.0004	0.0001
				(0.001)	(0.0004)
Constant	1.398^{***}	5.222^{***}	8.181^{***}	7.332^{***}	6.367^{***}
	(0.238)	(0.749)	(1.439)	(1.465)	(1.296)
Observations	1,219	985	985	985	1,137
Log Likelihood	-721.981	-559.555	-554.701	-546.268	-635.827

Note: *p<0.05; **p<0.01; ***p<0.001

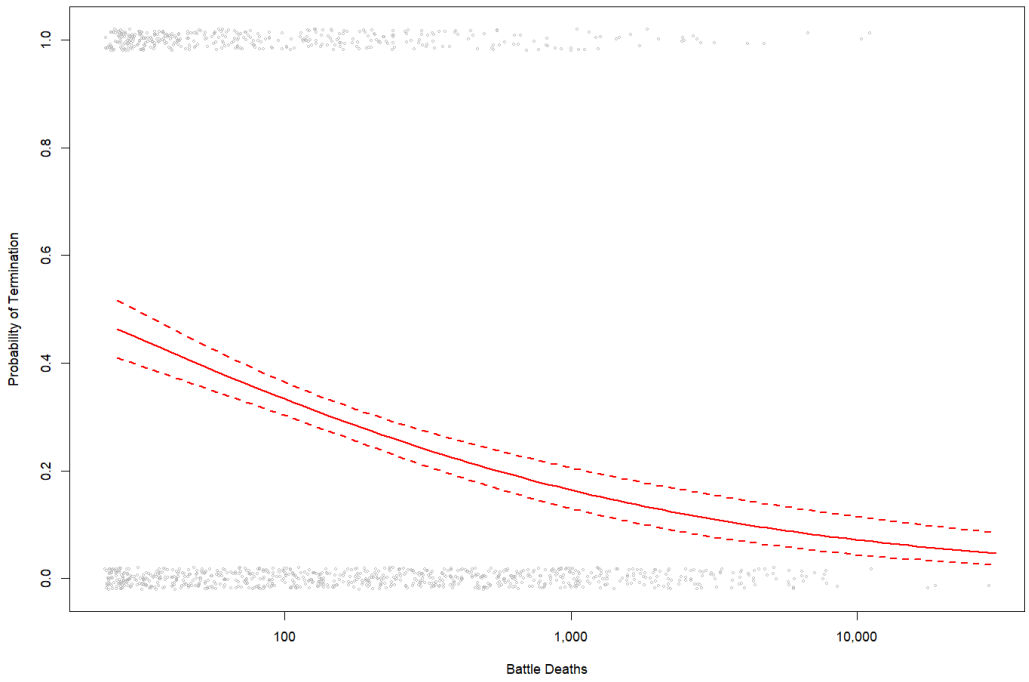

Figure 4.5: Estimated Probability of Conflict Termination by Conflict Intensity, using UCDP termination

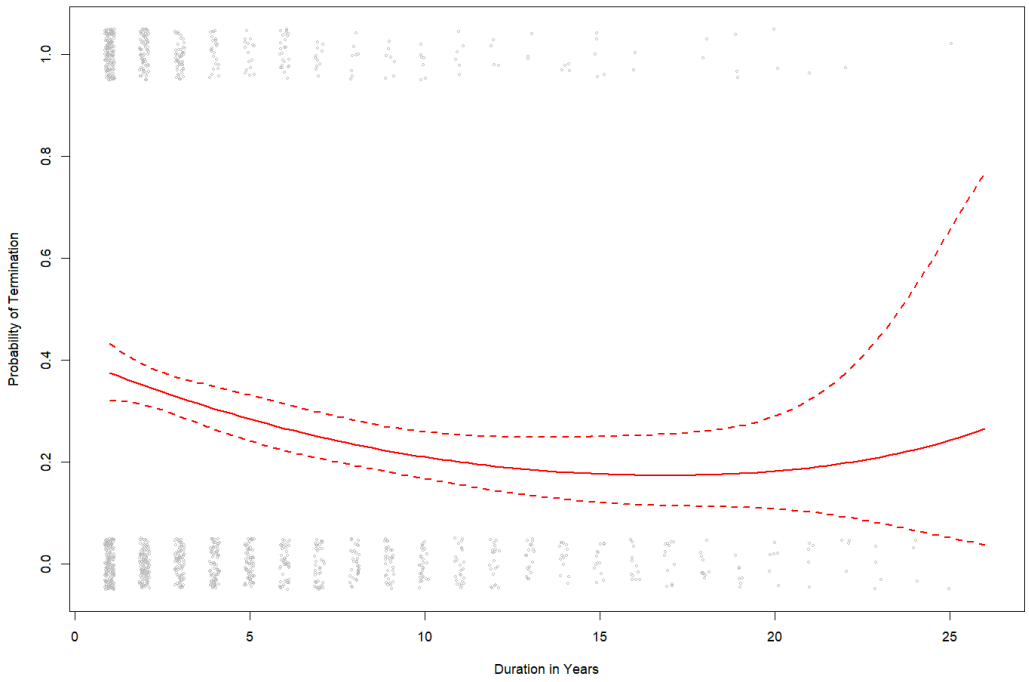

Figure 4.6: Predicted Probability of Conflict Termination Over Time, using UCDP termination

termination for conflicts which have been ongoing for more than 10 years. The UCDP termination data results in many conflicts being coded as shorter than they were in the original analysis, resulting in fewer cases of long duration. It also reduces the sample size considerably. These two factors together result in very low confidence for the few cases of conflicts lasting over 20 years.

Chapter 5

Conclusion

Understanding how civil wars are fought is a fundamental aspect of conflict studies. Without an understanding of what is going on within wars, it is difficult to explain why and how they begin and end. Rebels thinking of starting a war make their decision about whether or not to fight based on how they think the conflict will progress. During a war, rebels and governments both look at the military progress of a conflict when they make decisions about whether to continue to fight, and how to fight. In any peace negotiations, a major part of the decision of whether to negotiate, and what settlement actors are willing to accept, is based on their understanding of the military progress that is being made in the conflict. The fundamental role of fighting in civil wars makes understanding the determinants of conflict intensity a necessity. If we are to understand how wars end, we must understand how they are fought.

Conflict intensity is a key indicator of how a war is being fought. Most

civil conflicts are fought at very low levels of intensity, while a few reach high levels of intensity. The types of fighting observed in conflicts at different levels of intensity are qualitatively different, with many small insurgencies relying on guerrilla tactics to launch occasional attacks against government targets, while large rebel armies fight against government armies using conventional military tactics. In a guerrilla war the rebels rely on concealment and surprise, and only attack government forces when they can identify a particularly advantageous target. In a conventional war rebels and governments adopt the same tactics, and both sides are capable of launching large scale offensives against each other. These two types of conflict represent two extremes on a spectrum, with many conflicts falling in between, when rebels adopt a mixture of tactics appropriate to the situation.

5.0.1 Results

The choice of tactics adopted by the actors in a civil conflict affects how deadly the conflict will be, and the choice is based on the capabilities of the two sides. Weak rebels facing large government armies must adopt guerrilla tactics, and be very careful to avoid most combat situations. Strong rebels attempting to overthrow a weak government can be much more forceful and direct in their efforts, resulting in a substantially higher death toll from the conflict. I demonstrated this effect in Chapter 2, showing that the effect of rebel force size is large and positive, with a doubling of the number of rebel troops increasing the number of annual battle deaths by more than 50%. Given

the small number of fighters in many rebel groups a doubling (or halving) of the number of troops is feasible, and happens in most conflicts that last more than one year.

Although rebel troop levels appear to be the primary determinant of conflict intensity, the government also plays a role. Large government armies are able to deter rebels, and suppress violence. Government armies are almost always much larger than rebel forces, and although rebel tactics can give the rebels an asymmetric advantage, increasing the size of the government army can reduce the number of battle deaths in a conflict. Government armies vary in size much less than rebel forces, and are rarely doubled in size, however a 10% increase in the size of a government force will, on average, reduce battle deaths by about 1.4%.

In Chapter 3, the theory of conflict intensity is expanded to include the effect of foreign intervention. Foreign powers often intervene in conflicts, providing support to one side in order to help them win, or to increase the harm to their opponent. By helping one of the actors, the external supporter not only increases the capabilities of that actor, but also alters how the supported actor uses the resources available to them. Without a behavioral change, the increased capabilities would be expected to increase conflict intensity when given to the rebels, and decrease intensity when provided to the government. This is altered by the behavioral changes resulting from pressure from the external supporter on the supported party. A foreign power providing support wants to see those new resources put to good use, and the receiving party has

an interest in demonstrating that they are using those resources by increasing their combat efforts beyond the level that they would choose if the capabilities were unattached to an external party. This leads to external support to rebels having a large positive impact on conflict intensity, and, on average, external support to rebels increases conflict intensity by over 60%, even when accounting for the size of the rebel force.

External support to governments has a smaller effect, and is only significant when the support is in the form of foreign troops directly assisting the state, or when a foreign state provides the supported state with direct access to military and intelligence infrastructure. Close cooperation and integration of the military forces of two governments can increase the conflict intensity considerably, with an average increase of over 80%. Examples of this type of government cooperation include foreign troops from 31 different countries which fought alongside the government of Iraq in Iraq's conflicts with four different rebel groups, as well as cooperation given by Turkey to Iran to fight the Kurdistan Free Life Party (PJAK), which was in turn allied with the Kurdistan Workers' Party (PKK) in Turkey.

Understanding how capabilities and external support affect conflict intensity allows for a better understanding of how conflict intensity affects conflict duration. Chapter 4 tests the effect of conflict intensity on the probability of conflict termination, and shows that intense fighting reduces the likelihood of a conflict ending in a particular year. The effect of battle deaths on the probability of conflict termination is drastic, in part because of the large range

of intensity. Conflicts with only 100 annual battle deaths have an 18% probability of ending each year, while conflicts with 1000 battle deaths have only an 8% probability of termination. Further increases in intensity make it even less likely that a conflict will end, with conflicts over 10,000 deaths per year having only a 3% probability of ending in a given year.

The effect of intensity on termination is robust to the inclusion of variables for the number of troops on both sides. The capabilities of the actors in a conflict are therefore less important than how those capabilities are used, as expressed in the number of combatants who are killed in combat. Hence, a war that is particularly violent, given a small number of fighters, will be harder to end than a war with the same number of troops, but a lower level of intensity.

External support to rebels, which has already been shown to increase intensity, has an effect on termination in addition to the effect of intensity. Support to rebels reduces the probability of conflict termination by 30%, after controlling for conflict intensity, indicating that support does not just make wars hard to end because of changes to the dynamics within the conflict, but that the party providing the external support plays a role in preventing peace between the two warring parties, separate from the effect of the support they are giving.

5.0.2 Additions to the Existing Literature

The results from this paper expand the limited existing literature on conflict intensity, and help tie this new knowledge about conflict dynamics to the

existing literature on external support and conflict duration. The existing literature on conflict duration does not account for conflict intensity, and lacks a good understanding of how the fighting within a civil conflict affects the length of a conflict. Because of this, the existing literature on the effect of external support on conflict termination does not correctly reflect the effect of support on how actors act within a conflict.

The existing literature on conflict intensity is limited, and has primarily focused on structural variables, such as regime type and the nature of the dispute between the rebels and the government, and the effect of lootable resources (Heger and Salehyan, 2007; Eck and Hultman, 2007; Lujala, 2009; Weinstein, 2007; Wood, 2010). The only attempt to link the capabilities of the actors to the intensity of a conflict was limited to examining government capabilities, and failed to find a relationship between government strength and conflict intensity (Lacina, 2006). I have added to the emerging literature on conflict intensity by examining a fundamental determinant of intensity, and providing a theoretical framework and empirical results explaining much of the variation in conflict intensity. After accounting for actor capabilities, future studies can incorporate further aspects of conflict that will improve our understanding of how warring parties choose to fight.

The effect of foreign intervention on conflict intensity has received only a cursory examination in previous studies. External support has been argued to increase intensity, although tests of its effect have been limited to comparing the intensity of conflicts during the Cold War to conflicts after the Cold War

ended, and have not distinguished between support to rebels and support to governments (Hultman, Kathman and Shannon, 2014; Hultman and Peksen, 2015; Lacina, 2006; Lacina, Gleditsch and Russett, 2006; Balcells and Kalyvas, 2014). By adding the effect of external support to the theoretical framework of the effect of capabilities on intensity, and then testing that theory on more precise data than previous work, I have added to the literature by showing that support has different effects when given to rebels and governments, and that the effect also varies with the type of support that is given.

My findings on the effect of rebel and government troop levels adds to the existing literature on the relative strength of rebels and governments. Some research has theorized about and measured the relative strength of rebels and governments (Cunningham, Gleditsch and Salehyan, 2009), and discussed the effects of the balance of power between rebels and governments on the tactics used in the conflict (Kalyvas and Balcells, 2010). Relative strength is an important part of my theory of conflict intensity, and therefore also has an effect of duration, however I have gone further than using the ratio of rebel to government forces, and my analysis, using the total size of both rebels and governments, has created a better understanding of how rebels and governments fight than more limited studies that look only at relative strength.

The effect of external support on duration has been studied extensively. Many of the existing studies have looked at the interests of the foreign party, with diplomatic interventions, and interventions meant to help one side defeat the other, both reducing conflict duration (Regan, 2002; Regan and Aydin,

2006). The number of actors in a conflict, and the interests of outside actors, have also been shown to affect duration (Cunningham, 2006; Cunningham, 2010). My theory of external support is based around the decisions of the actors within the conflict, and how those actors respond to the new capabilities provided to them, as well as how they respond to the political influence of the group providing the support.

My research also goes into more detail than existing studies on the effect of different types of support, and the different effects of support to the rebels and governments. Most studies of external support look simply at whether there is an external party providing support to either of the actors in the conflict. Some studies have looked at the difference between support to rebels and support to governments (Collier, Hoeffler and Soderbom, 2004; Balch-Lindsay and Enterline, 2000). Newer research on the effect of external support has begun to look at the effect of different types of support on duration (Sawyer, Cunningham and Reed, 2017). By examining the effect of support on intensity I have created the possibility for future research on the effects of external support to better understand how support affects conflict dynamics.

Sawyer, Cunningham and Reed (2017) find that the number of rebel troops, and whether the rebels receive external support, both affect conflict duration. I have expanded on this finding by showing that troop levels and support are determinants of conflict intensity, and that intensity increases duration. Once intensity is included in the analysis, troop levels are no longer significant, and the effect of external support is reduced. My research adds to the findings

in Sawyer, Cunningham and Reed (2017), by demonstrating that the means by which the number of rebel troops affects duration is through its effect on intensity.

5.0.3 Policy Implications

Efforts to reduce the harm caused by civil wars can focus on ending conflicts, and on mitigating the amount of harm done while those conflicts are ongoing. Reducing conflict intensity reduces the number of people who die in war, and by improving our understanding of why some conflicts are more intense than others, I have helped to identify how to reduce the number of deaths in conflict. The number of troops in a rebel army is an important determinant of the number of people killed in a conflict. Efforts to reduce the size of rebel groups should help to reduce the number of deaths from conflict.

Although reducing the size of a group may be difficult, my findings can also be used to encourage outside actors to not intervene in a way that will increase the size and capabilities of rebels. External support to rebel groups can have disastrous effects on the intensity of conflict. Although outside actors often are intervening for purely self interested reasons, in which case the intervenor may be unconcerned with the effect of their actions on the combatants, some interventions in support of rebels are justified by a desire to end conflicts. My results make me skeptical of claims that supporting a rebel group will lead to a reduction in violence.

Supporting rebels will also cause the increased death toll to accumulate

over a longer time period. Any actor interested in ending wars should seek to reduce the intensity of a conflict, in order to make it easier for the actors to see that a military victory is unlikely, and encourage them to reach an agreement to end the fighting. By reducing the size of rebel groups, and denying them external support, conflicts should be less deadly in the short term, and they should end sooner.

The qualities of the government appear to have less effect on conflict dynamics than factors related to the rebels. I do however provide some evidence that strong governments are able to reduce conflict intensity, and that lower intensity in turn reduces duration. Efforts to strengthen governments may therefore help to mitigate conflict, depending on the nature of the intervention. When foreign governments directly intervene in conflicts, to support governments with troops and direct cooperation and assistance, it increases conflict intensity. Other forms of support appear to be less significant in affecting conflict.

International efforts to reduce conflict intensity should be promoted in an effort to resolve conflicts. There is some indication in the existing literature that arms embargoes and peacekeepers can reduce intensity (Hultman, Kathman and Shannon, 2014; Hultman and Peksen, 2015). This is encouraging not only because it reduces the number of people dying in the short term, but also in light of my finding that reducing intensity also makes it more likely that a conflict will end quickly. Outside efforts to reduce intensity should be further investigated, in order to find the best ways to suppress, and eventually end,

civil conflicts.

5.0.4 Future Research

My findings could be further improved by investigating several additional aspects of conflict dynamics. To better understand the causes of intensity, more research could be done to identify the capabilities of rebel groups, beyond simply the number of fighters they possess, as well as to better understand the link between the capabilities of conflict actors and the tactics they use. To better understand conflict duration, additional work could look at how wars end, as well as looking further into patterns of intensity, and theorizing more specifically about how the factors which change intensity also affect the likelihood of termination.

I have found a relationship between the number of fighters in rebel groups and the level of intensity of conflicts. The number of people fighting is a major factor determining the strength of a group, however it is a simplification to assume that all fighters are equally capable. The productivity of soldiers, in terms of their ability to fight, varies greatly, and is likely to be determined by both material and organizational factors. Organizations that are well equipped and organized, and capable of training their troops well, are likely to make much more use out of each individual than a less well organized group will.

Studies of state armies have identified some organizational determinants of military capabilities. Traditional military tactics changed greatly with the advent of modern weaponry, creating a distinction between traditional and

modern forces. Modern forces consist of specialized units that rely on mechanized transportation and modern communication to conduct coordinated maneuvers (Biddle, 2004). Organizational factors within a fighting force affect command and control, the effective use of intelligence, and the skill and level of training of forces (Talmadge, 2013). These concepts have been developed to describe state armies, but can potentially provide insight into the capabilities and organization of rebel forces as well.

Future work could also provide more insight into the tactics used by rebels, as well as by states. I have theorized that the capabilities of rebel groups and the governments they oppose determine the choice of tactics by rebels, and that the rebels choose a mix of tactics somewhere between guerrilla warfare, and conventional warfare. Existing work by Kalyvas and Balcells (2010) also uses those two categories, as well as the third category of symmetric nonconventional warfare. A more detailed study of the full range of tactics used by rebels, as well as the factors that drive them to choose certain tactics, would improve the fundamental understanding of why some conflicts are more intense than others.

My findings on conflict termination show that intense conflicts are longer, however more work could be done to explore why that is. Work to examine how wars ends would allow for a better understanding of how intensity is affecting them. I argue that intense conflicts make negotiation harder, whereas low-intensity conflicts are easier to end through negotiation. Not all wars end with a negotiated settlement however. In some cases one side is able to

achieve a military victory over the other. In other cases intensity drops to the point where the rebels simply stop fighting, without a negotiated ending. In particular, high intensity conflicts would seem to increase the probability of a decisive victory by one side or the other. Further work could evaluate whether intensity makes different types of conflict termination more or less likely.

Another aspect of termination that could be explored would look at changes in intensity over time, to see if the patterns in intensity over time are linked to termination. Some conflicts start off at low levels of intensity, and then grow more intense over time, before eventually ending. Other conflicts start off at a high intensity and then slowly decrease in intensity over time, until they finally fizzle out. A better understanding of what causes these patterns in the change of intensity over time could also help to explain why and when conflicts end.

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