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Humanitarian Aid and the Duration and Outcome of Civil Wars
Based on Rebel Group Motivation

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An abstract of
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Abstract

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Rebel groups can be differentiated based on whether their primary motivation is a desire for economic opportunism and personal greed or whether they are motivated by a desire for political change or policy reform. Based on this distinction, these rebel groups will interact with humanitarian aid in different ways. In theory, the presence of humanitarian aid will be damaging to rebel groups that are primarily motivated by grievances while the presence of humanitarian aid will be beneficial to rebel groups that are primarily motivated by greed. An instrumental variable probit with cubic time splines and a competing risks model are used to evaluate the impact of humanitarian aid on civil war duration and outcomes based on rebel group motivations. There is empirical evidence to support the hypotheses that the presence of humanitarian aid is associated with longer conflicts and that an increase in the amount of humanitarian aid is associated with an increase in the expected amount of time until a rebel victory.

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1 Introduction

Since World War II there has been a global shift away from interstate wars and toward more civil wars (Fearon and Laitin 2003). Scholars and policymakers have been focused on these conflicts and have noted that they tend to last longer and have more casualties (Sambanis 2004). There has also been a dramatic increase in the amount of foreign aid being distributed in recent decades. While these two topics are often studied by two different groups of political scientists with little overlap in theories or empirical research, recently there has been more and more research on the link between conflict and foreign aid. This paper focuses on the relationship between humanitarian aid and civil wars while taking into account two different types of rebel groups. The first type of rebel group is driven by some kind of grievance, and is using violence as a way to bring about political change. The second type of rebel group is motivated by greed and is using violence as a way to benefit themselves economically. Almost all rebel groups are some kind of hybrid combining both greed and grievance. I will refer to the different attributes of greed and grievance groups, and then for the empirical analysis I will classify rebel groups as being primarily motivated by either greed or grievance.

Previous research on civil wars has not given enough focus to that distinction and the important impact that rebel group motivation will have on civil war duration and outcomes. Taking into account the different motivations for these rebel groups can explain the different impacts that humanitarian aid can have in conflicts. This paper will examine the key differences between these rebel groups and then explain the different impacts that humanitarian aid will have on them. My central theory is that the presence of humanitarian aid will be damaging to rebel groups who are primarily motivated by grievances while the presence of humanitarian aid will be beneficial to rebel groups that are primarily motivated by greed.

A recent article by Nunn and Qian (2012) on the relationship between foreign aid and conflict noted a number of conflicts where foreign aid was potentially an important compo-

nent that explained some aspect of the fighting.[1] Some of these conflicts are better understood as economic looting disguised as civil war, such as the civil war in Somalia. While those cases were identified via qualitative work, large N analysis can be used to determine the impact of humanitarian aid across all conflicts, while controlling for other factors.

Older research viewed humanitarian aid as a way to increase stability and decrease the incentives for people to join rebel groups. Evidence shows that widespread famine causes instability and that starving people have an incentive to take up arms against their government (Bhaumik 2007; Ek and Karadawi 1991). Furthermore, governments which can help to deliver relief aid and assist people facing a humanitarian disaster can build support for the government (Baitenmann 1990). This suggests that the provision of humanitarian aid should help decrease the duration of conflict and decrease the support for rebel groups.

On the other hand, more recent research has challenged this assumption by pointing to instances where humanitarian supplies can be beneficial to rebel groups. This is because rebel groups can benefit economically from this aid by stealing it and reselling it for profit or by demanding a payment or tax on the aid to ensure its safe delivery (Findley et al. 2011; Nunn and Qian 2012; Polman 2011a).

There has been previous large N empirical and qualitative work that provides support for both of these theories and presents a puzzle about the impact of foreign aid in conflict zones. In this paper, I present an answer to this puzzle by showing that previous research has attempted to group together two distinct kinds of civil wars, which has confused the issue. There has been a problem in aggregating these greed and grievance civil wars together because the rebels have different motivations and are impacted by the concept of interest in different ways. Although rebel groups might all be concerned to some extent with both greed and grievance, determining their primary motivation allows for more sophisticated

[1] The conflicts where humanitarian aid played an important role were "Afghanistan (2001 - present), Western Sahara (1950s), the Democratic Republic of Congo (1971 - present), Ethiopia (1974-91), Eritrea (1972-74, 80-81), Israel (1950s), Iraq (1992), Liberia (1993-2003), Rwanda (1994-2008), Sierra Leone (1991-2002), Somalia (1991-present), Sri Lanka (1983-2009), Sudan (1983-2005) and the former Yugoslavia (1992-95)" (Nunn and Qian 2012, pg. 1).

analysis. The key difference is that war is costly for ideological groups who would prefer the war to end, but war is profitable for greedy rebels who would like to see it extended. This means that activist rebels have an incentive to achieve their goals and find an end to the conflict, while opportunistic rebels would like to avoid an end to the conflict so that they can continue to profit.

Ideological groups need funding to finance their efforts, but they are wary of looting resources because of the caliber of people it tends to attract and the incentives it creates for the group. This can interfere with these ideological groups being able to accomplish their primary goal (some type of political change). Greedy rebels, on the other hand, see an opportunity to loot humanitarian aid as just one of the options they have to enrich themselves during combat. In the analysis of this theory, I apply a key extension to the classical framework of greed and grievance by examining rebel groups directly. I point out some of the flaws in previous research that has attempted to answer questions about greed and grievance using state-level variables. Instead, I focus on rebel groups and explain how it is better to do analysis about rebel group motivation by examining variables that are unique to these rebel groups, when such data exists. In the analysis below, I use government-rebel group dyad years as the unit of analysis. While I sometime refer to the motivations or interests of individuals and how they are more or less likely to want to join a rebellion, this impact is then only seen at the level of a rebel group, with the expectation that this would make a rebel group more or less strong, respectively. While there has been some survey work regarding civil wars that is focused at the individual level (Humphreys and Weinstein 2008), I consider how this individual behavior will impact civil wars when aggregated at the level of a rebel group. For example, a situation which leads individuals to become more angry at the government would be utilized in this analysis with the assumption that this would benefit rebel groups that are fighting the government.

In Section 2, I discuss the relevant theory of conflict. Specifically, I consider previous arguments about greed and grievance, which would imply some specific predictions about

the likely impact of humanitarian aid on different kinds of rebel groups. Rebels groups that are motivated by greed and grievance have different priorities during conflict that influence how they view conflict. The classic bargaining model of war is used to understand the implications of humanitarian aid on conflict outcomes and duration. Section 3 contains a broad discussion of humanitarian aid, with a specific discussion of the determinants of humanitarian aid and how it should impact greed-based and grievance-based rebel groups. A second extension I make to the theory around greed and grievance is to take into account the unique properties of humanitarian aid. While previous research has discussed how natural resources can impact civil wars, I consider how humanitarian aid might have a distinct impact because of the unique properties of humanitarian aid.

Section 4 contains the hypotheses being considered in this paper. This paper challenges the idea that foreign aid might be able to stabilize governments or reduce conflict by noting that it can serve as a lootable resource for greedy rebel groups and provide an economic incentive that motivates civilians to take up arms. This suggests that, under certain circumstances, the presence of foreign aid should increase the duration of civil wars.

In Section 5, I present information about the data being used and the statistical results of the regression models. I discuss the empirical findings of the paper and how they relate to theories about the impact of humanitarian aid on greed and grievance rebel groups. Section 6 is the conclusion.

2 Greed and Grievance in Civil Wars and Theory of Conflict

The basic difference between greed and grievance as a motivation for rebel groups will be the foundation for this research. The distinction between the motivation of rebel groups as

either greed or grievance is a continuum, not a dichotomy. While there may be extreme cases (i.e. a rebel group that is exclusively seeking economic gain, or a rebel group that is purely interested in ideological change), most rebel groups exist somewhere on this spectrum. Because there is currently no data that exists which can accurately describe the exact location of rebel groups on this continuum, I use proxy measures which code rebel groups as being primarily motivated by one of these two concerns.

In this section, I will first explain how it is important to understand greed and grievances as motivation and to move beyond questions of feasibility or opportunity for rebel groups. While greed and grievance are a continuum, I discuss the ideal types for ease of understanding. Next, I discuss a few major flaws in the previous research around greed and grievance. Third, in the two sections below, I will lay out an understanding of greed and grievance which will lead to the empirical research in this paper.

While Collier and Hoeffler (2004) did not originate the idea of a distinction between rebels who are seeking out ideological goals versus those who are interested in economic-profiteering, the greed vs. grievance framework is associated with their work. In their paper, they conflated "greed" with "opportunity" and used proxy measures to operationalize "greed" which relate to how feasible it would be for rebel groups to mount an armed rebellion. While this question of "opportunity", "feasibility", or "viability" is an important one, it is an issue that applies to all rebel groups, regardless of their motivation. Because all rebel groups need some source of funding to sustain their rebellion, it is necessary to look beyond their concerns about feasibility to try to determine their underlying motivations. One of the difficulties facing researchers in this area is trying to distinguish between rebel groups who are using material resources to fund their rebellion as opposed to groups which are only interested in getting richer.[2] In the section below about greed, I will discuss some

[2]Samabanis, for exampled, noted that "we often cannot distinguish between 'war loot' that serves as a means to sustain the war effort, and 'loot' that is the ultimate aim of the war." (Sambanis 2002, pg. 224). This distinction is relevant to this project in that rebel groups motivated by grievance would be focused on war loot that is being used to sustain their fighting while rebel groups motivated by greed would be seeking out loot in order to enrich themselves.

of the other methods that scholars have used to try to capture the motivation of greedy rebel groups that move beyond just considering whether there are factors that might make armed rebellion more feasible.

One flaw in much of the previous research on greed and grievance as an explanatory framework for civil wars has been a focus on state-level attributes. This is problematic because civil wars are often regional in nature, because more than one rebel group often participates in a civil war, and because state-level variables that are being used can be spatially heterogenous in nature. This can be a problem because these state-level variables that are being used to differentiate between greed-based and grievance-based rebellions might not apply to all rebel groups equally. For example, a variable like the Gini coefficient, which measures the level of economic inequality within a group of people, might vary within a state between different regions or between different ethnic groups. For this reason, when determining the motivations of different rebel groups, it makes sense to examine the rebel groups themselves. There are certain characteristics that we might expect to see if a rebel group is motivated by greed or grievance and it will be more useful to examine rebel groups themselves to see what their motivations are, rather than looking at state-level characteristics and attempting to apply those state-level variables equally to all rebel groups operating in the country at that time. While data for some variables only exists at the state level, any variables which have been coded at the level of the rebel group are preferable to use.

Another flaw in the research regarding rebel motivations is that many of the variables being used to indicate greed or grievance are ambiguous in various ways. One problem is that some of the variables that are being used to indicate greed or grievance might apply to both of those concepts. One example of this is natural resources. Natural resources are often cited as a useful variable to distinguish greedy rebels, as these rebels might be profiting from these resources during the conflict, or they might seek to overthrow the government so they can begin profiting from rents once they are in control of the state. Ross (2004) did

not dispute that natural resources might be linked with greed, but he argued that they could also be an indication of grievance instead: “resource extraction creates grievances among the local population, because of land expropriation, environmental hazards, insufficient job opportunities, and the social disruptions caused by labor migration; these grievances, in turn, lead to civil war" (pg. 41). Others have made similar claims about natural resources being associated with grievance rather than greed, and so the mere presence of these natural resources is not necessarily a useful way to determine if a rebel group operating in that state is motivated by greed or grievance (Klare 2001, Gedicks 2001). Looking at the characteristics of rebel groups to determine whether they are motivated more by greed or grievance is a more efficient approach for understanding this dichotomy, rather than attempting to examine the ambiguous state-level variables which previous researchers have considered.

2.1 Economic Inequality and Grievance as a Motivation for Conflict

Scholars have speculated that grievance could motivate those who are challenging the state. This can influence both rebel groups as a whole when they decide to engage in conflict, and individuals who are deciding whether or not to participate in a conflict. I consider the literature regarding grievance and explain how it can apply to a subset of the rebel groups that participate in civil wars. While all citizens might have reasons to be upset with the government, “rebellion occurs when grievances are sufficiently acute that people want to engage in violent protest" (Collier and Hoeffler 2004, pg. 564) This understanding of grievance as a motivation for conflict will then be used to explain why humanitarian aid can have different impacts on civil wars based on the nature of the rebel group.

These issues were explored by Collier and Hoeffler (2004), who wrote that, “rebellion may be explained by atypically severe grievances, such as high inequality, a lack of political rights, or ethnic and religious divisions in society” (pg. 1). Collier and Hoeffler did not find

broad empirical support for the idea that economic inequality could explain the prevalence of civil wars. Some of the grievance issues mentioned by Collier and Hoeffler (and others) are related to socio-economic status, while others are not (Regan and Norton 2005). Ethnic and religious issues, for example, can be unrelated to questions regarding economic issues. If the grievances of a rebel group are unrelated to economic factors or deprivation, then providing humanitarian aid will not ameliorate those concerns.

The findings of Collier and Hoeffler were furthered by Reenock et al., who argued that it was not inequality that was a problem per se, but specific economic conditions. They found that "when needs deprivation exists in the face of enhanced economic development, citizens will not only notice deprivation more readily, but also, given the greater social surplus, deem it more unacceptable, provoking radical demands for redistributive justice." (Reenock et al. 2007, pg. 542). This sort of "needs deprivation" is operationalized by the authors as the daily food supply per capita, measured in calories. This suggests there would be a strong link between the populations that would most need humanitarian aid and the situations where we expect to see this grievance-based conflict breaking out.

This basic idea about deprivation being linked to violence has been explored by other researchers. In the broadest sense, scholars have examined how peasant rebellions are more likely in situations of unequal land distribution and that when exploitation reaches a certain point, violent conflict becomes more likely (Booth 1991; Moore 1976; Russett 1964; Scott 1976). Booth noted, regarding Latin America in the 1970s and 1980s, that "economic development trends worsened the region's historically extreme maldistribution of wealth and income, intensifying grievances among negatively affected class groups" and that when reforms were not approved, this led to "revolutionary coalitions that fought for control of the state" (pg. 34). With this previous research on issues of inequality, it can sometimes be difficult to tell whether violent revolts are motivated by grievance over the level of inequality, or about the deprivation that people are facing. While the provision of humanitarian aid would likely lessen concern stemming from either of these motivations,

it should have a larger impact in the latter situation.

Evidence from India provides support for the idea that a lack of access to adequate food can provoke this kind of conflict against the government. There were several factors that combined to build resentment among the people of Mizoram, a state in Northeastern India that eventually led to conflict with the government. The most important was the *mautam*, or cyclical famine, caused by an exploding rat population. A species of bamboo native to Mizoram flowers every 48 years, and this causes an increase in the supply of food for the rat population which quickly expands. When the bamboo food source runs out, this expanded rat population eats all of the locally stored grain causing a famine (Bhaumik, 2007). The creation of the major rebel group in Mizoram, the Mizo National Front, can be traced to one of these *mautam* episodes:

> Tribal elders in Mizoram remember the deadly Mautam of 1958-59, that led to a widespread famine in the Mizo Hills... "When it happened, our people just starved and hundreds of angry young Mizos like me picked up weapons to fight a government that showed no concern for us." The MNF started as the Mizo National Famine Front to provide relief to the starving people but then the word "Famine" was dropped and its leaders declared their intention to fight for freedom from India. The MNF guerrillas engaged Indian security forces in a bloody insurgency for 20 years until an agreement in 1986 brought the fighting to an end. Since then, peace has held in Mizoram (Bhaumik 2007, pg. 1).

If this analysis about the role of “needs deprivation” and grievance based conflict is correct, then the presence of humanitarian aid should have a calming effect. Providing food aid to people facing extreme circumstances should make them less likely to fight as the major grievance that is motivating them is removed. Therefore, we would expect that the provision of humanitarian food aid is linked with shorter conflicts for these particular kinds of conflicts.

Beyond the specific issue of how humanitarian disasters might cause anti-government sentiment, there is also the potential for famine conditions to increase the level of instability

within a region. Previous research indicates that famine conditions are associated with large scale refugee flows which can lead to political instability and conflict (Ek and Karadawi 1991) and that the price of staple food crops within a country is linked to the level of intra-state violence (Arezki and Brückner 2011, pg. 3).

There is still debate over the role of grievances in conflict, with some scholars attempting to dismiss its importance, as grievance, and specifically ethnic grievance is common, while it only develops into civil war on rare occasions (Kalyvas 2007; Skocpol 1979; Tilly 1978). Cederman and others dispute this, and say that both grievance and opportunity are important for understanding conflict, especially onset (Cederman et al 2010; Cederman et al 2011; Wimmer et al 2009).That we see civil wars in situations that are not economically profitable for rebel groups indicated that grievance is a sufficient motivation for conflict. The ability to characterize rebel groups as primarily motivated by grievance based on either the characteristics of the rebel group or the characteristics of the conflict suggests the importance of grievance for these rebel as distinct from rebel groups that are primarily motivated by economic opportunism.

The above research works to establish the important ways that grievance can serve as a motivating factor for conflict. This indicates that when rebel groups are primarily motivated by grievance, any factors which can serve to lessen the level of grievance should pacify these rebel groups and benefit the government. For these activist/ideological groups, fighting is costly and is a necessary evil they must engage in to achieve some political goal that they are working toward. They would prefer to end the conflict as soon as they can achieve victory, or be in a position to negotiate an agreement that is acceptable. Because these rebel groups are challenging the state, they almost all begin the conflict weaker than the government. Therefore, anything that is introduced into the conflict that would serve to weaken or disrupt the rebel group, strengthen the government, or lead civilians to lower their level of support for the rebels, should serve to shorten the duration of the conflict. The presence of humanitarian aid can have all these negative effects on activist rebel groups.

2.2 Greed as a Motivation for Conflict

Under the greed and grievance framework, greed is the second motivation of rebel groups that can be used to understand conflict. When rebels are motivated by greed, it allows for a simplification of the way we understand conflict. Surviving and being able to continue to fight is often the motivation for these rebels, as they are not seeking outright victory. In reporting from Africa, Jeffrey Gettleman has described this dynamic among rebel groups who see continued conflict as their primary goal, and not outright victory:

> There is a very simple reason why some of Africa's bloodiest, most brutal wars never seem to end: They are not really wars. Not in the traditional sense, at least. The combatants don't have much of an ideology; they don't have clear goals. They couldn't care less about taking over capitals or major cities - in fact, they prefer the deep bush, where it is far easier to commit crimes (Gettleman 2010, pg. 2).

War can be particularly beneficial to rebels who are motivated by greed, as conflict can mean that more lootable resources are available, and that it is easier for rebels to obtain them. Conflict often increases the amount of humanitarian aid flowing into the area (Polman 2010; 2011; Lancaster 2007). Once peace is restored, the power of the state makes aid looting harder for rebels as the state's monopoly on the use of force interferes with their efforts. Together, these incentives mean that rebel groups who are economically opportunistic would prefer to see conflict extended. This means that any variables which might strengthen these opportunistic rebel groups will extend the duration of the war. For rebel groups that are seeking economic gains that can only occur after the conflict is over (i.e. profits from offshore oil reserves), humanitarian aid can still work to extend the duration of the conflict. This is because these rebel groups start out weaker than the government, and their primary interest, at first, is preventing a quick defeat from the government (Mason and Fett 1996, pg. 552; DeRouen and Sobek 2004, pg. 307) The humanitarian aid which flows into a conflict zone when conflict breaks out can serve as a source of funding for these rebel groups and therefore serve as a source of strength when they are trying to prevent

being defeated by the stronger government.

Also, actions that might seem counter-productive make sense under the logic of these greedy rebels. One example of this is atrocities against civilians. For grievance based rebel groups, violence against civilians can be extremely, problematic as it can alienate the local population (Valentino, Huth and Balch-Lindsay 2004). Rebels who are seeking to overthrow the state understand the importance of cultivating the support of the general population because building this popular support is often essential to achieve a military victory. Greedy rebels, on the other hand, do not need mass support from the population in order to loot. To the contrary, the very act of looting often involves stealing from civilians, and this can require using violence against them. Evidence has been emerging that rebels will intentionally commit violence against civilians as a way to increase the amount of aid flowing into a region.[3] Previous efforts to study greed and grievance rebel groups have failed to adequately distinguish between these different types of groups and the way their underlying motivations can impact their actions.

The extent to which rebel groups might rely on looting of humanitarian aid is based in part on what other resources they might have access to, which can place constraints on them. Beardsley and McQuinn (2009) noted the difficulty faced by the Free Aceh Movement because of the lack of natural resources available to them and the lack of a diaspora population that could provide them with remittances. In that situation, the support of the local population became especially crucial. While looting humanitarian aid would be an option, it would come with a heavy price tag as it could alienated the local population. The Free Aceh Movement had to be cautious about the predation that they engaged in.

While rebel groups that are operating under a greed motivation are interested in looting humanitarian aid supplies, they also can benefit economically from whatever other resources might be available. For that reason, I control for the other major source of eco-

[3] In "War Games", Polman (2011) discussed decisions by rebels in Sierra Leone to commit atrocities against civilians to increase the amount of aid that was flowing in. Recent reporting from the Democratic Republic of the Congo (DRC) discussed the way rape can be used as a tool to increase the amount of aid being delivered (Heaton 2013).

nomic revenue during a conflict (i.e. natural resources, and outside economic support). A wider body of research has already examined how rebel groups will be impacted by the presence of these natural resources during a conflict (Ross 2004a; Ross 2004b; Ross 2006; Fearon 2004) and has noted that under some circumstances these lootable natural resources provide a source of funding and a motivation for fighting which can extend the duration of a civil war.

As noted above, for rebel groups that are motivated by grievance, anything that serves to lessen the grievance will harm the rebel groups and strengthen the government's position because it will make individuals less likely to engage in conflict against the government. For rebel groups that are motivated by greed, an increase in the source of lootable materials should extend the conflict, as it increases the motivation for these rebel groups to keep fighting.

2.3 Theory of Conflict for Duration

Expectations about the impact of humanitarian aid on civil war duration are based on an underlying theory of conflict. I rely on the existing bargaining model of war to show how humanitarian aid can impact war duration. This is a similar approach to Narang (2011) regarding how we should understand conflict duration, with one key difference. Narang argued that war can be viewed as a costly lottery, or more precisely, as a costly process, and that rebel groups and governments are motivated to find a way to end the conflict: "Despite the fact that the amount of humanitarian assistance administered during a conflict is never so large as to make war completely costless for the parties involved, the effect of mitigating the costs of war is to reduce the informational value of fighting and increase the number of battles needed to converge on reliable estimates of opponent's strength" (pg. 69). While Narang might be right about a lack of information playing a role in delaying the resolution

of conflict, I believe he fundamentally overstated the cost of conflict to rebel groups, and therefore failed to accurately analyze situations where war is not costly, but instead is beneficial to rebel groups. As explained by Gettleman (2010), in some circumstances, war can be profitable, both for rebel groups, and for individual rebels, and conflict can therefore be preferable to the peacetime alternative. When the assumption that war must be costly for rebel groups is removed, it allows for an extension of Narang's analysis that can explain why the presence of humanitarian aid will extend the duration of conflict for certain types of rebel groups.

A theory of conflict based on the bargaining model of war which allows for war to be basically costless (or in an even more extreme situation, economically beneficial for at least one side) therefore allows for a war of extended duration if this condition is met. But even if the rebels see war as beneficial, (i.e. because fighting is associated with dramatically increased amounts of humanitarian aid, and if the fighting stops the flows of aid might dry up), the government's incentive to end the conflict because of the costs that it pays means that there will still be a reason that the war could end. While the bargaining model of war suggests that governments will want to find an end to the conflict, Gettleman (2010) argued this is difficult because, "even if you could coax these men out of their jungle lairs and get them to the negotiating table, there is very little to offer them. They don't want ministries or tracts of land to govern. Their armies are often traumatized children, with experience and skills (if you can call them that) totally unsuited for civilian life. All they want is cash, guns, and a license to rampage. And they've already got all three. How do you negotiate with that?". The benefits to certain kinds of rebel groups that exist during conflict make it especially difficult for these wars to end.

There is also a question about rebel groups that are seeking economic concessions, or who are inspired by economic opportunism, but who can only realize those economic gains after the fighting has ceased. While groups that are interested in wartime looting obviously would prefer that the war continues, these other groups might see an advantage to the war

ending, and so it is less clear what impact strengthening these groups will have on conflict duration. Strengthening these groups might make it easier for them to keep fighting, which would extend the war, or strengthening those groups might make them more of a threat, and so the government would be more like to strike a deal and end the conflict. Regan (2002) argued that strengthening rebel groups that are economically motivated would be more likely to extent the conflict, even if these groups might be interested in seeing a peace deal reached. He cites two reasons for this. The first that is strengthening a rebel group is likely to bring them closer to parity which demands more concessions from the government and is likely to lead to a "hurting stalemate". Second, as the rebel groups take into account factors which strengthen their position, they become more likely to overestimate their likelihood of success, which makes a deal more difficult. Collier and Hoeffler (2000) make a similar point about how factors that increase the strength of these rebel groups are more likely to lead to "forecasting errors". Taken together, this logic indicates that for economically motivated rebel groups, factors which strengthen the group are likely to extend the duration of conflict. This applies both to groups which are explicitly interested in prolonging the conflict, and those groups which would see some kind of benefit after the fighting stops.

While the above argument explains how the bargaining model of war can predict an extended duration for conflicts involving economically motived opportunistic rebel groups, politically motivated rebel groups, on the other hand, will continue to view fighting as costly and hence will seek an end to the conflict (Fearon 1995; Powell 2004; Reiter 2003). This is based on the standard logic of the bargaining model of war, where both sides pay costs during the duration of the war, and they are seeking an end to the conflict so that they can reach an agreement that provides them with at least some of their demands.

The presence of humanitarian aid can serve to lessen the grievances of these rebel groups (i.e. what they are fighting to have rectified), and as their grievances decrease, it should lower the motivation to fight, for these rebels. Therefore, they will be more interested in seeking an end to the conflict. The costs that a rebel group is willing to bear in a

conflict is related to the level of grievance that they are facing. Also, the amount of time that a rebel group can engage in conflict against the state is based, in part, on how much support they are receiving from the population. When humanitarian aid is being provided it can undermine any grievances being caused by a lack of access to adequate amounts of food or other humanitarian concerns, and also make it harder for the rebels to recruit from this marginalized population. On the other hand, one of the cautions that previous scholars have raised about humanitarian aid is that it can help sustain warring parties during a conflict (Duffield 1994; Duffield 1998). When these two factors are considered together, the benefits of humanitarian aid might not be entirely on the government's side in civil wars that involve rebel groups that are primarily motivated by grievance.

2.4 Theory of Conflict for Outcomes

Just as the bargaining model can be used to provide a useful framework for understanding the impact between humanitarian aid and different types of rebel groups, the bargaining model of war can also be used to understand how humanitarian aid will impact civil war outcomes. First, I consider the impact of humanitarian aid on rebel groups that are primarily motivated by economic greed. Because humanitarian aid is helpful for these opportunistic rebel groups, this means that it will increase the likelihood of outcomes that these groups would prefer and decrease the likelihood of outcomes that the government would prefer. For the rebel groups that are benefitting from the existence of conflict itself, this means a continuation of fighting (which they prefer) will be correlated with the presence of humanitarian aid. It also means that a government victory will be less likely. The presence of humanitarian aid provides a source of funding for the rebel groups and it increases the incentive for them to fight. Both of these factors will make a government victory less likely. Even though the provision of humanitarian aid might be helpful for the government in terms of lowering the grievances of the general population, this does not have a large impact on opportunistic rebel groups, as these rebel groups are not necessarily trying to

win over mass support. Under the bargaining model of war, opportunistic rebel groups feel less pressure to make a bad bargain when humanitarian aid is being delivered, and this can allow for them to keep fighting until they can secure a better agreement. This is because the presence of this aid lowers the cost of fighting for them, and also makes it harder for the government to defeat them militarily.

For rebel groups that are primarily motivated by grievance, the presence of humanitarian aid will potentially be harmful to them, as explained above. In a worst case scenario for these rebel groups, the disbursement of humanitarian aid will lessen grievances that exist toward the government and make it harder for these rebel groups to recruit. This will make it easier for the government to defeat the rebels, and lead to worse outcomes for the rebels.

As rebel groups that are primarily motivated by grievance consider whether they should consider fighting or make a settlement, some of what they consider is their expected gains at the end of the conflict, their ongoing costs from fighting, and their current level of grievance. If the presence of humanitarian aid works to lessen the grievances of the affected population then they would be more likely to settle and would not think it is as important to keep fighting to achieve their goals. On the other hand, if the presence of humanitarian aid provided them with sustenance while they are fighting, it would make it easier for them to keep up the struggle. For this reason, just as with duration, the impact of humanitarian aid might be to increase the likelihood of outcomes that are favorable to the government, or it might have a mixed impact.

3 Humanitarian Aid and its Role in Conflict

Humanitarian aid is an important factor for understanding conflict. I first present a definition of humanitarian aid and offer some basic information about it, then I discuss the determinants of humanitarian aid, and finally I explain how it is likely to impact conflict for greed and grievance rebel groups.

3.1 The Basics of Humanitarian Aid

Humanitarian aid is a specific subset of foreign aid, and it is commonly distinguished from development aid and military aid. The Global Humanitarian Assistance Guide provides one definition of humanitarian assistance:

> Humanitarian aid is a sector of Official Development Assistance (ODA) that includes: disaster prevention and preparedness, reconstruction relief, relief coordination, protection and support services, emergency food aid and other emergency/distress relief. This strict definition of humanitarian aid, which is governed by the principles of neutrality and impartiality, marks it out from development aid, which can be subject to some conditionality (Global Humanitarian Assistance 2012).

Along with providing directly for the basic needs of people who are suffering from humanitarian crises, a report from the OECD Development Assistance Committee recognized that humanitarian aid can also help consolidate fragile peace processes by supporting "societal reconciliation, political development and physical reconstruction." (Development Assistance Committee 1997, pg. 9). These are often secondary goals for the providers of humanitarian aid, who are primarily seeking to alleviate humanitarian crises.

While development aid "is defined by its long-term objectives, humanitarian assistance and relief operations are seen as short-term aid which involves immediate, survival assistance to the victims of crises and violent conflicts" (Malmqvist 2000, pg. 3). This is the major distinction between the two types of aid: development aid often has the ability to focus on different types of needs than humanitarian aid, such as economic development, because of the longer time frame associated with it.

Data from 2008 showed that global humanitarian aid had surpassed $11 billion dollars per year. The largest donors of humanitarian aid have been the United States, the Netherlands, the United Kingdom, Sweden, Norway, Germany, and France, Canada, Japan, and Australia. The largest recipients of aid have been Africa (40%), Asia (35%), and Europe (19%) (Stromberg 2007, pg. 212). The best data on aid is from the OECD countries, who

supply the vast majority of humanitarian aid to needy recipients.

3.2 The Determinants of Humanitarian Aid

When humanitarian crises occur, states and multilateral organizations will respond in order to help those in need. An important consideration for the disbursement of this aid is that the "humanitarian imperative comes first" and "aid priorities are evaluated on the basis of need alone" (Development Assistance Committee 1997, pg. 35). More broadly, "the general humanitarian principles constitute the framework within which aid is delivered — impartiality, neutrality, access, and parties' responsibility" (Malmqvist 2000, pg. 3). In practice, these ideals are not always upheld, and there are some additional factors that can impact state decisions about aid giving.

Even when aid providers suspect that aid is being misused or stolen by rebel groups, they will continue to attempt to provide aid if people's lives are in danger as part of an ongoing humanitarian crisis (Bryer and Cairns 1997). This has caused controversy in the aid community when credible evidence has shown that aid was contributing to a conflict situation or being mis-used. A prominent example of this was the aid that was being delivered to Rwandans that were living in refugee camps in Zaire in the aftermath of the Rwanda genocide as this aid was then being used by rebel groups that were operating from within those camps (Barber 1997; Pottier 1996)

The provision of humanitarian aid is often linked with conflict zones (both active wars, and post-conflict situations). Messer et al (1998) identified 30 million people living in areas of active conflict where aid was being delivered and more than 10 million of those people were dependent on humanitarian assistance. Research has shown that conflict zones tend to attract large amounts of aid, as countries that are experiencing "complex crises" which are prolonged issues combining state capacity issues, conflict, and humanitarian problems

are major recipients of aid (Lancaster 2000, pg. 22). These complex crises "create large numbers of refugees and displaced people. . . are highly destructive of life and property. . . and continue for many decades" (Lancaster 2000, pg. 22).[4] This description of a complex crises corresponds well to many of the civil wars that make up the empirical data for this project.

While there is a theoretical commitment, described above, about targeting aid based on need, research has confirmed that this need-based allocation is actually being followed in practice for humanitarian aid (Nielsen 2010; Fink and Radaeli 2010; Hilhorst 2002, 2005). Beyond need as a primary motivation for humanitarian aid giving, there are a few other factors that have been found to correlate with donation levels. One of the single best predictors of humanitarian aid giving is the gross domestic product per capita of the recipient country, as wealthier countries receive less aid (Drury, Olson, and Van Belle 2005; Nielsen 2010).

Scholars disagree about the role that the level of democracy among recipient countries has on aid amounts. Alesina and Dollar (2000) argued that democratic governments would receive more aid because of the good governance associated with those countries, while others (Bueno de Mesquita and Smith 2009; Alesina and Weder 1999) have argued that more autocratic governments will receive more aid. Fink and Radaeli (2010) found no empirical relationship between government type and aid amounts. To complicate analysis related to regime type, the level of democracy of a country can predict both the willingness of countries to offer aid and the expected amount of aid needed by the country. States with a democratic government might be able to receive more aid based on donors favoring democratic regimes, but those regimes should be better motivated to meet the needs of the population and prevent the need for humanitarian aid donations ever to arise.

[4]The United Nation's Department of Humanitarian Affairs provides monitoring and aid in response to humanitarian crises. They echo similar language regarding the way a variety of factors can combine to exacerbate a humanitarian situation: "For the UN a complex emergency is a major humanitarian crisis which is multicausal. This can include the interaction of poverty, economic and environmental collapse, institutional decline and conflict, and requires an integrated response on behalf of the UN system, donor governments and associated NGOs." (Duffield 1996, pg. 187)

Other factors are based on the bilateral relationship between the donor and recipient country. One of the most prominent characteristics that has been found to relate to humanitarian aid giving is a former colonial tie between the donor and recipient country (Alesina and Dollar 2000; Stromberg 2007; Fink and Radaeli 2010). Similar to this, there is also a correlation between aid amounts and a shared language between donor and recipient (Fink and Radaeli 2010).

Previous research has attempted to determine whether bilateral giving is based on strategic motivations by the donor countries. The operationalization of strategic interest has varied between scholars, and the findings related to this strategic interest have been mixed. Nielsen (2010) found a strategic component to bilateral giving, while Duffield (1996) found that after the end of the Cold War, humanitarian aid giving was no longer strategic in nature. Ball and Johnson (1996) did a two decade study of United States humanitarian aid disbursements and found that aid appeared strategic in nature in the 1970's and based on genuine need in the 1980's. For humanitarian aid, the strategic considerations appear to be less of a factor than the other issues described above.

Because the humanitarian aid data being used for this paper is aggregated for recipient countries, it should ameliorate concerns about bilateral decisions related to aid. While individual donor countries might make decisions based on considerations other than need for some recipient countries, every other donor that is contributing aid to that country will be doing so based on need and so the total amount of aid being delivered should reflect the underlying humanitarian concern. Also, even if donor governments deliver some small portion of their aid for strategic reasons, the impact that humanitarian aid has on rebel groups occurs independently of the reason why the aid was delivered.

In the empirical section of this paper, I discuss the relationship between the various independent variables and control variables in this project, including whether different kinds of conflicts receive different amounts of humanitarian aid.

3.3 Strategic Decisions by Governments and Aid Providers around Humanitarian Aid

There is a potential concern that governments that are parties to civil wars or those who are disbursing aid might make strategic decisions. This could involve governments interfering with the provision of aid in various ways, such as by preventing it from getting to areas that are facing humanitarian disasters. For the providers of aid, they might make decisions about the amount of aid to be delivered to a certain area that is contingent upon the presence or absence of conflict, or the expected duration of the fighting. These kinds of strategic decisions might bias the results of any analysis about the relationship between aid and conflict. For example, a theory might be built around the idea that rebels can gain monetary value from looting humanitarian aid. But if aid is delivered to a country and then prevented by the government from reaching the area where rebels are operating, they will not have the opportunity to loot this aid. Therefore, it is worth determining, first, if aid is delivered to areas based on the need of the population, and not on other factors. Second, it will be necessary to determine if governments seem to engage in behaviors that might interfere with the distribution of this aid.

Regarding the provision of humanitarian aid, there are three reasons to believe that it is based on need and not other factors and that the potential for bias in the statistical analysis is not a concern. First, previous empirical analysis has determined that during conflict, the level of aid is correlated with factors related to need and uncorrelated with factors that are strategic in nature. Second, although there are theoretical reasons that aid might be artificially increased or decreased during conflict, there is not evidence that this is happening during civil wars. More importantly, even if any potential bias might exist from aid practitioners, this bias would come from observable factors that can be used as controls in the statistical analysis. Finally, there are a variety of first and second hand reports written by aid practitioners, or by those who have interviewed aid practitioners, and this evidence

indicates that during conflict humanitarian aid provision is based on need.

Analysis about the determinants of humanitarian aid, and the role of humanitarian need in determining the quantities of aid being delivered is outlined in section 3.2 above. Narang (2011) addressed this same concern in his research about the relationship between humanitarian aid and conflict. He found that "humanitarian assistance is in fact independent from many of the strategic interests found to effect development assistance" (pg. 46) and "With few exceptions, humanitarian assistance to ongoing civil wars appears to be positively associated with rising indicators of humanitarian need and generally uncorrelated with the strategic interests of the largest donors" (pg. 48). On the other hand, there is evidence that development aid is linked to strategic concerns, although that is outside the scope of this project.

There is also the possibility that aid providers might deliver aid based on their perceptions about conflict or conflict duration. On the one hand, aid deliveries could be more likely in situations where a conflict is perceived as being likely to be winding down or about to end. This is because the aid providers might think that aid would be more effective if it were thought to be going to an area that was transitioning toward peace, as it is easier to engage in successful development projects when conflict is not occurring. On the other hand, aid agencies might be more likely to send aid to conflict zones which are perceived to be ongoing or increasing in severity, as a continuing conflict is more likely to indicate an ongoing need for this aid. While either of these alternatives is possible, and while they would indicate an expected opposite bias in the results, there is not any evidence that aid providers are making predictions about the expected duration of conflict when they send humanitarian aid. The empirical evidence does show that aid increases after conflict begins, but there is reason to believe that this is based on the increase in need for humanitarian aid that is caused by the conflict, and not additional assumptions or bias from the aid providers unrelated to this increase in need. Even if the aid providers were not biasing their amount of aid that went to conflict zones based on strategic factors, the level of need for humani-

tarian aid might vary between conflicts, and hence different conflicts will receive different amounts of aid. It would still be possible to capture these same observable factors that aid providers use in a statistical analysis and control for them, which turns the endogeneity problem into a selection problem.[5] Although I attempt to use the appropriate control variables in the models in this paper, the added step of using an instrumental variable approach should further solve any possible endogeneity issues.

There are a variety of reports from those involved with the provision of humanitarian aid that the commitments around neutrality and impartiality are upheld when decisions about aid are made. If aid agencies are basing aid deliveries on need and if they are being neutral and impartial in these decisions then there is less concern about how their might be strategic or other factors that could bias where aid goes. Anderson (2004) defined these terms: "neutrality, which is the assurance given by humanitarian agencies that their efforts are not in military support of either side, and impartiality, which means such effort is rendered to the noncombatant population of each side without distinction and according to need" (pg. 41). This emphasis on neutrality and impartiality, when followed through on, indicates that it is humanitarian need which would be the determining factor for the amount of humanitarian aid that is provided to a specific conflict zone. There are a variety of reports from those who work in the aid community, those who formerly did that kind of

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In his research on the relationship between humanitarian aid and conflict, Narang (2011) outlined this concern and one potential solution: "Second, the level of humanitarian assistance may be selected based on other observable indicators of conflict that are themselves correlated with the duration of civil war... If these variables are then correlated with the duration of war, omitting them from the analysis would lead to underspecified models with biased estimates... Aid organizations can, however, treat conflicts more or less intensively based on beliefs about how likely a certain conflict will last or not, but these expectations must be formed indirectly based on observable indicators (or symptoms) that are correlated with the duration of civil war. If this is the case, the endogeneity problem essentially becomes a selection problem where the level of aid observed in any intra-war period is determined with respect to observable factors that are either known or unknown to be correlated with the duration of conflict. To limit bias from strategic selection in the estimates, the ideal statistical analysis would include any variables that are correlated with both the amount of humanitarian aid allocated to a conflict in a given year and the likelihood of the conflict continuing past that year."

work, and secondhand reports that all confirm that the principles of neutrality and impartiality are upheld. This includes numerous first-hand reports from those who are active in the aid community, or who have previously worked on humanitarian aid projects, including unilateral single-state organizations (Bjøreng, 2003), the International Committee of the Red Cross (ICRC 2008), a former aid worker from Save the Children and the United Nations (Labbe, 2013), the former Deputy Emergency Relief Coordinator and Deputy Head of the UN Office for the Coordination of Humanitarian Affairs (Labbe, 2013), and Doctors Without Borders (Doctors Without Borders, 2013). The commitment to delivering aid to people in need is so strong that these aid flows continue even in the face of obvious abuse. One of the notable examples of this was at Goma, where a refugee camp was set up for Hutu refugees who had fled from Rwanda to Zaire after the genocide. It was determined that aid was being sent to people who had participated in the genocide, and that the people receiving the aid were in the process of plotting additional attacks. Even in such an extreme case, while some humanitarian organizations stopped delivered aid, others stepped in to pick up the slack, even as this aid was being used to help fund ongoing violence.[6]

There are also reasons to believe that governments that are participating in civil wars are not interfering with the flow of aid to needy recipients. The three main reasons for this is that amounts of money involved, while potentially large for rebels, are small for governments, that it is a very serious crime for governments to block the flow of aid, and because there are very few reports of it happening from previous conflicts.

With humanitarian aid, the values involved are often quite small. This means that there is little monetary incentive for a government to try to intervene to seize the goods in order to benefit economically. In their recent analysis about aid and conflict Nunn and Qian (2012), found that throughout their data, the aid being delivered was valued at around

[6]See, for example: “The guerrillas in the camps in Zaire proved so noxious, however, that two of the most prominent relief organizations there - Doctors Without Borders and the International Rescue Committee - could not stomach the abuse of aid this time, and pulled out. Yet Bob Devecchi of the International Rescue Committee, who made the decision for his group, noted that U.N. officials immediately hired another NGO to administer the food handouts and other programs in the camps” (Gizelis and Kosek 2005)

.0016 of total GDP. Even in situations where the pure monetary value of the aid might be of practical value to a country (i.e. countries that received hundreds of millions of dollars of aid in a single year), the logistics of attempting to loot even a small portion of this aid become insurmountable.

Another deterrent that prevents governments from interfering with humanitarian aid is because doing so is a serious crime. There are a variety of international treaties and precedences that make interference with the provision of humanitarian aid by a government a war. Depending on the severity of the situation, and the level of interference from the government, there are a variety of potential crimes that a government can be charged with. This is discussed in the context of Sudan by Usmani (2007): "The following analysis will show how restrictions on humanitarian aid access in Sudan can be construed as genocide, crimes against humanity, and war crimes, thus allowing for the prosecution of those persons involved in such crimes." The legal basis for the argument that governments cannot interfere with the provision of humanitarian aid comes from international humanitarian law and human rights law (Stoffels 2004), the Statute of the ICC (Rottensteiner 2009), the Geneva Conventions, and prior case law from international tribunals, such as from the ICTY (Berber 2009). This threat of punishment provides a clear incentive for governments to avoid interfering with humanitarian aid. A decision to interfere with humanitarian aid only begins to make sense in the rare context of a civil war where the government is already committing crimes against humanity and hence already likely to face prosecution after the conflict.

Attention that has been focused on denial of humanitarian aid is mostly focused on a few unique cases, indicating that such behavior is quite rare in practice. As the above paragraph makes clear, there are potentially serious ramification if a country attempts to interfere with the delivery of humanitarian aid. This means that if this interference has been occurring, there is likely to be a discussion of this in the academic literature, as well as a response from various international institutions and courts. In fact, the vast majority of

the attention about denial of humanitarian aid is focused on Sudan and incidents from the former Yugoslavia. The bulk of the academic writing either addresses the issues in broad terms, and uses Sudan as an example (Diprizio 2007; Duffield 1997), or is written exclusively about Sudan (Reeves 2011; Middleton and O'Keefe 2007; Islam 2006). Similarly, United Nations Security Council Resolutions have been passed condemning the looting of aid in Sudan and Bosnia-Herzegovina (Lien 2009) and prior jurisprudence around this issue, as well as threats of prosecution, focus on those two conflicts (Rottensteiner 2009).

3.4 The Impacts of Humanitarian Aid on Conflict

With a framework for conflict that recognizes the differences between rebel groups that are motivated by greed and grievance, it is possible to consider what impact the presence of humanitarian aid will have on these civil wars.

3.4.1 Humanitarian Aid in Grievance Conflicts

When a civil war is motivated by grievance, the presence of humanitarian aid will strengthen the government by decreasing popular support for the rebels. A rebel group requires that some people will be upset enough with the government to join them in fighting the government, and that members of the population at large will also support them in other ways. The provision of humanitarian aid can directly decrease the grievances that people have with the government, and it can also lead to general feelings of goodwill from the population toward the government if the government is a partner in the provision of this humanitarian aid.

While humanitarian aid could technically be a source of income for these rebel groups, if they decide to loot this aid, that will also cause problems for them. As described by Weinstein (2007), there are some key differences between ideological/activist rebel groups, and rebel groups that are motivated by greed. Rebels who are motivated by a grievance seek to attract fighters with long time horizons, who are committed to the ideological goals, who

are not motivated by personal gain, and who are willing to follow orders. If a grievance rebel group decides to begin looting humanitarian aid it will attract people who do not necessarily have any of these characteristics and this will weaken the rebel group. Attempting to loot aid will also serve to alienate the very population that these rebel groups rely on for support. That is an important distinction between humanitarian aid and other kinds of natural resources. If a rebel group decides to profit from a natural resource, such as diamonds or rare earth minerals, this does not necessarily put them in direct conflict with the local population. With humanitarian aid, it is intended for the local population, and so looting this aid will be even more likely to cause a decrease in support among the local population.

For these reasons, when humanitarian aid is available in a conflict it will harm a grievance rebel group and decrease the duration of the fighting as the rebel group is more likely to be defeated or make a settlement with the government. It will also be more likely to lead to outcomes that are preferable to the government, rather than for the rebels.

It is also useful to consider situations where there is not a need for humanitarian aid until after a conflict has begun, or where the motivations of rebel groups are unrelated to any humanitarian issues. In that situation, providing humanitarian aid in a country might not directly impact the ability of rebel groups to attract support, as the original motivation for the conflict would still exist. For example, if a conflict was based entirely on friction between religious communities, the onset of violence could lead to an increase in the need for humanitarian aid in the country. The provision of this humanitarian aid would not impact the initial feelings of religion tension that led to the initiation of the conflict.

3.4.2 Humanitarian Aid in Greed Conflicts

Rebel groups motivated by greed have different motivations and incentives, so the presence of humanitarian aid will have a different impact on them. Humanitarian aid will serve as a lootable resource for these groups which means that it will increase their incentive to keep fighting, and it will provide additional funding for the rebel group. Both of these

factors will extend the duration of the conflict. These greedy rebel groups also do not need to worry about the support of the local population, so they can be less concerned about the impact of the humanitarian aid on civilians. Even if looting aid angers the people that the aid is intended for, these shortages only serve to increase the value of the aid and make more people interested in engaging in illicit wartime activities.

For these reasons, when humanitarian aid is available in a conflict it will benefit a greedy rebel group and this will increase the duration of the conflict and increase the likelihood of outcomes that are favorable to these rebel groups.

4 Hypotheses

The literature review and theoretical discussion above suggests hypotheses regarding civil war duration and outcome that can be tested empirically.

Hypothesis 1a: The presence of humanitarian aid will decrease the duration of civil wars among grievance rebel groups, or have no effect.

Hypothesis 1b: The presence of humanitarian aid will increase the duration of civil wars among greedy rebel groups.

Hypothesis 1c: An interaction between variables that indicate economically opportunistic rebel groups and humanitarian aid will lead to an increase in duration while the opposite will hold for politically motivated rebel groups.

Hypothesis 2a: The presence of humanitarian aid will decrease the likelihood of civil war outcomes that are favorable to grievance rebel groups, or have no effect.

Hypothesis 2b: The presence of humanitarian aid will increase the likelihood of civil war outcomes that are favorable to greedy rebel groups.

Hypothesis 2c: An interaction between variables that indicate economically opportunistic rebel groups and humanitarian aid will increase the likelihood of civil war outcomes that are favorable to these rebel groups while the opposite will hold for politically

motivated rebel groups..

5 Operationalization and Data

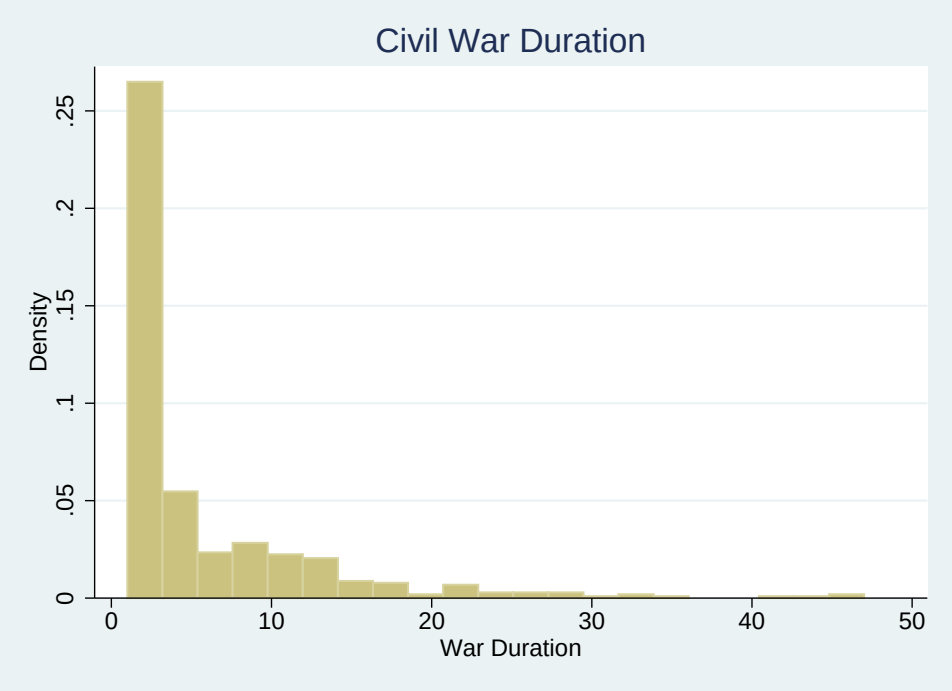
5.1 Civil War and Rebel Group Data

In order to produce an empirical test of the hypotheses in this paper, I use information on conflict from the *Non-State Actor Data* developed by David E. Cunningham, Kristian Skrede Gleditsch and Idean Salehyan. This data is described in their paper, "It Takes Two: A Dyadic Analysis of Civil War Duration and Outcome" (Cunningham et al 2009). The data itself has since been extended through 2010. Their data is an extension of the the *Uppsala Conflict Data Program (UCDP)/International Peace Research Institute, Oslo (PRIO) Armed Conflict Data*, which they have expanded by producing additional information about the non-state actors (rebel groups) that participate in civil wars.

The *Non-State Actor Data* covers 1945 to 2010 and includes 207 different civil wars in 103 different countries. UCDP/PRIO have adopted the following definition for civil war to determine which conflicts to include in the dataset: "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths" (2012, pg. 1). The duration of these conflicts ranges from a minimum of 1 year to a maximum of 47 years.

Because of the data about specific rebel groups, analysis can be done that uses rebel-government dyad years as the unit of analysis. This means that any civil war can have multiple actors coded as participating in the conflict. These rebel groups can enter and leave a conflict at different times. All rebel groups fighting in a country at the same time are not necessarily a part of the same civil war. While the modal number of rebel groups per civil war is 1, the largest number of rebel groups fighting in a single country at the

Figure 1: Histogram of Civil War Lengths



same time is 11 different rebel groups that were all involved in conflict in India at the same time.[7] This also allows the value of variables to vary between different rebel groups that are participating in the same conflict. For example, in 1991 there were multiple rebel groups righting in Uganda. The Uganda National Rescue Front had territorial control during the conflict while the Former Uganda National Army did not have territorial control during the conflict.

5.2 Greed and Grievance Rebel Groups

While rebel groups can be motivated by a mix of both both greed and grievance, because of the limitations of the data, it is necessary to group them into one category or the other when using the presence of a political wing as the defining factor for the first part of the empirical analysis. In order to do that, I create a dichotomous variable based on the primary

[7] In India in 1997, the following rebel groups were all active: All Tripura Tribal Front, National Liberation Front of Tripura, National Socialist Council of Nagaland, United Liberation Front of Assam, National Democratic Front of Bodoland, People's Liberation Army, United National Liberation Front, Kashmir Insurgents, Naxalites, the Maoist Communist Center, and the Kuki National Front (Gleditsch et al. 2012).

interest of the rebel group. Then, for a second round of tests, I interact humanitarian aid with a variety of variables that are associated with politically motivated or economically opportunistic rebel groups or which are likely to impact the relationship that humanitarian aid has on civil war duration.

As a method of classifying rebel groups, I use the existence of a political wing as a way to proxy for greed versus grievance rebel groups. The *Non-State Actor Data* has a variable that records if each rebel group has a political wing. Numerous researchers have considered the importance of a political wing when examining conflict dynamics and the motivations of rebel groups, although this research has largely been qualitative in nature. Ganguly (2004) noted how the Liberation Tigers of Tamil Eelam (LTTE) can best be understood only in light of the relationship they have with the Tamil National Alliance (TNA). The close link between the LTTE and TNA demonstrates the underlying grievance that served as motivation for the civil war. While in situations of violence, the rebel group often plays a more prominent role in achieving the group's goals than the political wing, in his study on terrorist violence, Post (2005) discussed how the Basque separatists in Spain were active in the political process and also had a military wing that engaged in violence. Additional work on the relationship between rebel groups and their political wings has considered Hamas and its conflict with Israel (Ayoob 2004), the National Resistance Council in Congo-Brazzaville (Englebert and Ron 2004), the Rwandan Patriot Front in Rwanda (Kuperman 1996), and the United Democratic Salvation Front in Sudan (Young 2003).

The existence of a political wing is considered a clear indication that a rebel group has political goals that it is trying to accomplish. There are 235 rebel-government dyads with the presence of a political wing and 325 rebel-government dyads without a political wing. While these grievance rebel groups are still in need of funding, they would prefer not to engage in the looting of humanitarian aid supplies for a couple of reasons. First, because it can alienate civilians, in a way that other sources of funding generally will not. Rebel groups that are trying to accomplish a political goal would prefer instead to get funding

from some external actor, such as a sympathetic patron, or from some other lootable resource, which would not put them in direct conflict with the civilian population. Second, looting humanitarian aid is a function of conflict, and rebel groups that are motivated by grievance are seeking an end to the conflict so that their political goals can be accomplished. While the presence of an allied political wing is a clear and strong indication that a rebel group is motivated by some kind of political grievance, the reverse is not always true. The absence of a polical wing is not a clear indication that a rebel group is primarily motivated by an interest in privately enriching themselves via conflict.

As a second type of robustness check, I consider the approach that many other scholars have adopted when examining the role of greed and grievance in rebel groups. Because any one rebel group might have a mixture of motivations, a classification scheme that attempts to separate them into one type or another might end up being accurate enough to be useful, or it might be overly simplistic. Another approach is to examine factors within the country that might indicate the presence of grievances or of economic opportunities which might be motivating rebel groups, such as illustrated by Collier and Hoeffler (2004). They considered proxies for opportunity and for objective grievance, to see which of these factors are predictive of war initiation. A similar approach can be adopted with characteristics that would be correlated with rebels groups that are more likely to be motivated by greed or grievance. Then, an interaction could be used with humanitarian aid amounts to determine if the impact of humanitarian aid on conflict differs between those two situations. The best way to capture greed is via the presence of various kinds of natural resources. While it is possible that these natural resources could be used as a funding mechanism for groups that are motivated by underlying political grievances, as opposed to greed, Weinstein argued that the crowding out effect would mean that these civil wars would soon see a shift toward opportunistic looting. In a situation where there was high levels of lootable natural resources, I then expect that there would be similar looting of humanitarian aid, which would serve to increase the strength of the rebel groups and prolong the fighting.

On the other hand, factors that can be linked to political grievances should have the opposite effect when interacted with humanitarian aid. As is explained above, the presence of humanitarian aid should have a harmful impact on rebel groups when the rebel groups are motivated by grievances against the government. Some of the measures of grievance that are used by Collier and Hoeffler (2004) are "ethnic or religious hatred, political repression, political exclusion, economic inequality" (pg. 570).

There two approaches all capture various aspects of the potential motivations for rebel groups, and can be used to confirm if the impact of humanitarian aid on conflicts is different between different types of rebel groups.

5.3 Humanitarian Aid Data

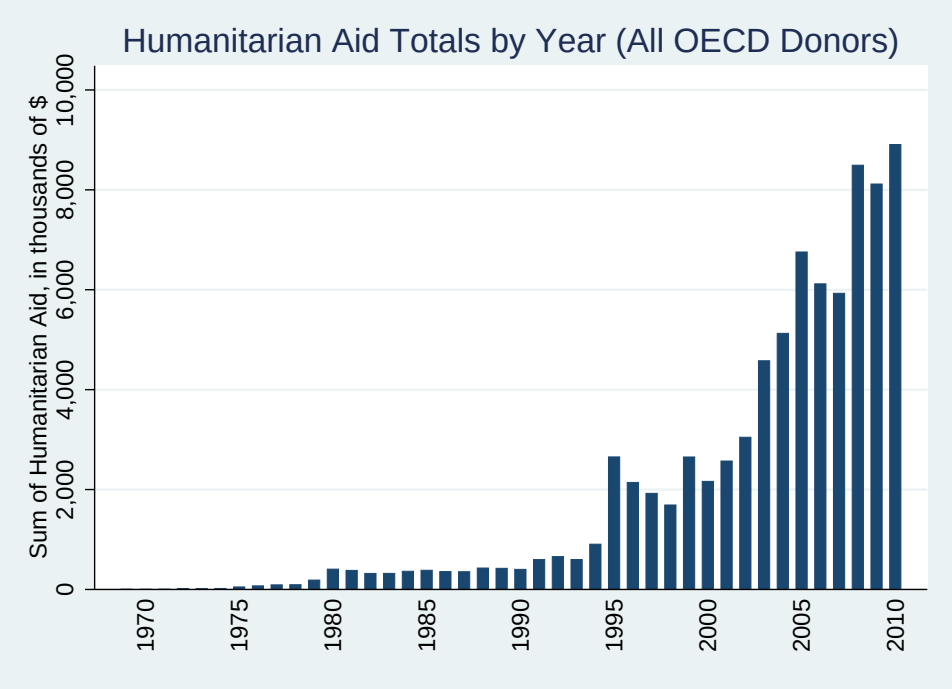
Along with the data on conflict, there is also data available on humanitarian aid which will be used as the key explanatory variable for this project. The OECD has a broad category of Official Development Assistance (ODA), and a subset of that is humanitarian aid, which is defined as "assistance designed to save lives, alleviate suffering and maintain and protect human dignity during and in the aftermath of emergencies." This includes, "relief coordination, protection, support services and material assistance like food and medical supplies." It is measured in thousands of US dollars (OECD 2012). This aggregated data includes:

1. "bilateral humanitarian aid disbursements from DAC member countries,
2. aggregated non-DAC member disbursements, and
3. aid activities financed through multilateral institutions' regular budgets and international NGOs." (OECD 2012)

The data extends from 1969 to 2009. The amount of humanitarian aid being distributed each year has been steadily increasing over time. Additional information about the humanitarian aid variable is provided in Table 1: Descriptive Statistics. Because of the skew for

the humanitarian aid variable, I transform the values by taking the square root.

Figure 2: Sum of Humanitarian Aid by Year



5.4 Control Variables

For control variables, I use data produced by Cunningham, Gleditsch, and Salehyan (2012), as well as the *World Development Indicators* from the World Bank (2012) and the *Quality of Government Dataset* from Teorell et al. (2012).

Gross Domestic Product per capita (logged): The log of the gross domestic product per capita is included as a control variable because of its potential explanatory impact on the duration of conflicts and its correlation with the amount of humanitarian aid that is being delivered. Economic growth is also used as a variable.

Democracy: This variable is created using the polity index, but modified to eliminate the component that is linked to political violence. The impact of democracy on civil war

duration is disputed among scholars (Hegre 2001; Muller and Weede 1994; Vreeland 2008; and Fearon and Laitin 2003). On the one hand, democratic governance should make conflict less likely by providing a non-violent alternative to resolve disputes. On the other hand, dictatorships are often willing to crack down on armed opposition groups more extensively than democracies do. Also, rebel groups can make use of the human rights protections offered under a democracy to help sustain their insurgency. Others suspect a curvilinear relationship with anocracies seeing the highest level of conflict. Democracy is included as a control variable because of its potential correlation with humanitarian aid, as donors may be more willing to assist democracies (Brown 2005). As a robustness check, I reran the analysis using the dichotomous measure of democracy developed by Cheibub, Gandhi and Vreeland (2009).

Population (logged): This variable is from the *World Development Indicators*. Population size is positively correlated with longer civil war durations and with increased need for humanitarian aid.

Territorial Control: This is a dichotomous variable that indicates whether or not a rebel group exercised control over specific territory in the state. The variable is from the Non-State Actor Data. The control of territory can be contrasted with an alternative rebel strategy, the use of guerrilla tactics. A definition for guerrilla tactics is provided by Valentino, Huth, and Balch-Lindsay (2004) who noted that it is characterized by the use of irregular forces, avoiding decisive set battles, and guerrilla forces "usually operate in territories under the military control of their opponents" (pg. 384). Previous work has established that territorial control is correlated with longer conflicts (as it provides a base for rebels to operate from) (Cunningham et al 2009), and there is reason to suspect that when rebels control territory they can more readily profit from humanitarian aid (Polman 2011).

Rebel Support: This variable measures whether rebels are receiving outside support from government or non-state actors. The data is from the *Non-State Actor Data*. This measure is a useful control variable because this outside support can mitigate the impact of

humanitarian aid, especially on greedy rebel groups. There is also a link between levels of outside support and expected war duration, as outside support of rebels is associated with longer civil wars (Cunningham et al 2009, Cunningham 2010). The variable is created by combining measure in the Non-State *Actor Data* which indicate if rebel groups received either military or non-military support from outside actors.

Government Support: This variable is similar to the Rebel Support variables except it is for government support instead. The theoretical relationship to civil war outcomes and duration, as well as the construction of the variable are the same as with the Rebel Support variable.

Battle Deaths (logged): Data on battle-related deaths can help control for the severity of the conflict. This could be related to both the duration of the conflict, and the need for humanitarian aid. The data is from the Uppsala Conflict Data Program (2012).

Ethnic Fractionalization: Another important variable to control for is the ethnic characteristics of the country. Ethnic conflicts, or ethnic groups engaging in conflict as a distinct rebel group, might have certain advantages, or make certain outcomes particularly likely. Ethnicity has been considered as a factor to understand group cohesion (Collier and Hoeffler 2004) the level of grievance (Collier 2001), intractability of conflicts (Kaufman 1996), or the idea that ethnic conflicts are somehow distinct (Sambanis 2001). Humanitarian aid provisions might also be linked to the ethnic component of a conflict (Esman and Herring 2003).[8] Fearon (2003) has data on the ethnic/linguistic fractionalization of a country. It measures the probability that two randomly selected individuals belong to different ethnic groups.

Official Development Assistance (logged): This variable has been collected by the OECD. It is defined as "Net official development assistance (ODA) consists of disburse-

[8]Specifically, the authors write, "When providing relief intended for the innocent victims of conflict, donors often confront a harsh dilemma, the ethnic salience of humanitarian assistance... Should donors work through the contending organizations to maximize the likelihood that at least some aid will reach the truly needy - and thus be charged with ethnic bias - or should they persist in withholding aid until they can be assured that it will be distributed impartially?" (Esman and Herring 2003, pg. 241)

ments of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients" (World Bank 2012). There is a potential correlation between amounts of ODA and civil war duration as well as between amounts of ODA amounts of humanitarian aid.

Mountainous Terrain/Forests: In theory, rough terrain provides a haven for rebel groups to engage in rebellion. Rough terrain could also be correlated with increased need for humanitarian aid because the state would have more difficulty providing services in that area. Alternatively, it could be harder for humanitarian aid agencies to deliver aid to areas with inhospitable terrain.

Diamonds/Gemstones: Previous research has found a link between conflict duration and the presence of surface or alluvial diamonds or gemstones (Fearon 2004, Buhaug et al 2009). Data from the Diadata (Gilmore et al. 2005) and Gemdata (Flöter, Lujala, and Rød 2007) databases are used to create a dummy variable that records whether production occurred during a conflict period. These resources could provide an alternative funding source to greedy rebel groups, whether or not humanitarian aid is present in a conflict zone.

Gini Coefficient: This variable measures the level of income inequality in a country. It can be tied to the expected level of grievances that populations might have regarding the distribution of wealth, but more importantly, it serves as a useful proxy for the opportunity cost in fighting. In states with high income inequality, looting of humanitarian aid will be a particularly appealing trade-off for people to make who are considering joining a rebellion. The data is from the World Bank's World Development Indicators.

Schooling: This variable measures the amount of schooling from males up to age 25. It primarily serves to measure the opportunity cost that exists for those considering joining a civil war. The data is from Barro and Lee (2000) in the Quality of Governance dataset.

Oil Rents: This variable has been used by a number of researchers, although prob-

lematically, it is used to operationalize different underlying concepts. In one instance, it is used to help indicate when state capture would be particularly valuable, as these rentier profits only accumulate to rebels who can seize the state. High levels of oil rents have also been associated with a diminished state capacity, as a result of a government that can fund itself via natural resource rents as imposed to taxation and a functioning state apparatus and bureaucracy (Collier and Hoeffler 2000; Fearon 2005). In rare circumstances, oil rents are used to indicate a dedicated stream of funding that can use to maintain a military presence that would preclude any efforts at armed rebellion. The data is from the World Bank's World Development Indicators.

Primary Commodity Exports: This variable represents a country's reliance on particularly valuable and lootable resources, which would indicate rebels particularly motivated by economic concerns. What Collier and Hoeffler (2002) described as "coffee, narcotics, diamonds and other gemstones", and which are likely to eclipse humanitarian aid in value to rebel groups. Fearon (2005) disputed the strength of the relationship between these commodity exports and conflict. The data is from the World Bank's World Development Indicators.

5.5 Descriptive Statistics

The descriptive statistics for each variable are included in Table 1.

6 Empirical Analysis on the Duration of Civil Wars

I use an instrumental variable probit model to account for possible endogeneity between civil war duration and levels of humanitarian aid. There are a couple of issues of concern. First, there may be a relationship between the amount of humanitarian aid that is being delivered and the expected duration of a conflict. This could be because aid providers are actively considering how long they expect a conflict to last, or because there is some

Table 1: Descriptive Statistics

Variable	**Mean**	**Std. Dvt.**	**Minimum**	**Maximum**
Humanitarian Aid	1.61	3.58	0	39.52
Rebel Political Wing	.45	.49	0	1
Rebel Grievance	.65	.49	0	1
Rainfall	-.67	2.01	-12.98	10.65
log GDP per capita	7.56	1.58	3.99	11.59
GDP growth (%)	2.17	6.77	-50.05	90.47
Democracy	3.04	2.59	-6	7
log Population	15.05	1.49	6.03	13.88
Territorial Control	.43	.49	0	1
Rebel Support	.66	.47	0	1
Government Support	.57	.49	0	1
Battle Deaths	7.31	1.79	2.56	12.02
Ethnic Fractionalization	.56	.23	.04	1
log Development Aid (% of GNI)	.53	1.87	-9.22	4.53
Mountainous Terrain (%)	35.22	26.89	0	100
Diamonds/Gemstones	.41	.62	0	4.50
Gini Coefficient	42.27	9.42	23.31	60.68
Schooling	3.85	2.24	.13	9.70
log Oil Rents	-2.19	4.67	-9	4.66
Commodity Exports	21.26	2.25	13.31	27.89

unobserved or unincluded variables that are related to both factors. Second, the level of humanitarian aid being delivered could be related to the type of conflict that is occurring. Aid donors might provide more aid to conflicts that involve rebel groups motivated by grievance rather than rebel groups motivated by greed because they are worried about the aid being looted. If either of these assumptions are true, then it would interfere with the empirical analysis.

To conduct the analysis for this project, I utilize an instrumental variable probit with cubic time polynomials. The dependent variable for the probit analysis is war termination. The instrumental variable is used to model the amount of humanitarian aid sent to a country while taking into account the relationship that might exist between conflict and humanitarian aid deliveries. The cubic time polynomials is an approach developed by Carter and Signorino (2010) to account for time in probit analysis.

6.1 Determinants of Humanitarian Aid and Instrumental Variable

In a previous section, I discussed the variables that other scholars have determined are useful predictors of humanitarian aid amounts. This includes the population of the country, the gross domestic product per capita, and the level of democracy. Because the humanitarian aid data is aggregated at the recipient level, I cannot examine variables based on dyadic characteristics, such as colonial ties between a donor and recipient. While these dyadic characteristics might be useful when examining the amount of humanitarian aid that a specific donor gives to a specific recipient, once aid data is aggregated at the recipient level it should mitigate these other factors. Instead, I focus on the recipient-country variables that are likely to affect humanitarian aid amounts, and which also might be linked to civil war duration.

Because the amount of humanitarian aid being delivered to a country might be related to the civil war which is occurring, it raises the question of endogeneity. In order to account for this, I used an instrumental variable to predict the amount of humanitarian aid for each

country. The use of an instrumental variable is useful for addressing two potential problems that might occur if there is an endogenous relationship for the variables of interest. The first problem is that a normal regression cannot be used if explanatory variables are not included in the model (i.e. omitted variable bias). The second problem is if variation in the dependent variable causes changes in the independent variable. If the exogeneity assumption does not hold, then estimates of the coefficients obtained using standard regression methods will be biased and inconsistent.

Previous research has focused on the relationship between rainfall and conflict, and a number of scholars have used rainfall as a an instrument because of its useful qualities, including its exogenous nature. The data on rainfall is from the Palmer Drought Severity Index (PDSI) and covers all countries from the years 1942 to 2010. With the PDSI, lower numbers mean less rain and higher numbers mean more rain, although the PDSI has been adjusted in various ways to account for domestic factors. The includes local temperatures and soil characteristics. I use "rainfall" for convenience sake throughout the paper, although in reality the PDSI data is more complex than that, as it is not a simple measure of the amount of rainfall in a country that year. Data on rainfall alone can be misleading because equivalent amounts of rain in different countries can have different impacts based on local characteristics. The PDSI data that I have extends from roughly -12 to 10. It has been normalized to zero, and so values below zero indicate that an area might be experiencing drought conditions. There should be an inverse correlation between the amount of rain and humanitarian aid, as less rain will be associated with drought, which is associated with a need for humanitarian aid.

Previous research has examined the possible relationship between rainfall and conflict, and others have made use of rainfall as an instrumental variable because of its exogenous quality. Buhaug (2010) found that climate (i.e. drought) was a poor predictor of civil conflict in Africa, while Bruckner and Ciccone (2009) found that there is not a significant link between rainfall and civil war onset. While Miguel, Satyanath, and Sergenti (2004)

found a link between conflict and rain, Bruckner and Ciccone (2009) argued that this was because they failed to control for relevant risk factors for conflict. Jensen and Gleditsch (2009) argued that Miguel, Satyanath, and Sergenti (2004) failed to account for spatial clustering in the rain data which biased their results. Witsenburg and Adano (2009) found no relationship between rain level and violent livestock raids in Kenya. Gray and Kevane (2008) found that rain was a weak explanatory factor for the violence in Darfur.

For my initial check, I ran a regression with rain data as the only regressor, and then a more expanded model including population size, GDP per capita, and level of democracy. Finally, I ran a full model that included all potential exogenous regressors that will be included in the baseline model for the analysis in my paper, as including all other exogenous regressors is the appropriate specification for the first stage of an instrumental variable analysis. In all regressions, the rainfall variable performed as expected (less rain is associated with a greater need for humanitarian aid, more rain with less humanitarian aid), and was statistically significant. Population and GDP also performed as expected in all the regressions (larger populations need more aid, and countries with higher GDP per capita need less aid). I also produce a simple scatter plot (in Appendix 1) including just the humanitarian aid data and rainfall data with a best fit line showing that as rainfall increases, the amount of humanitarian aid decreases.

With this regression, rainfall serves as a strong predictor of humanitarian aid. As a diagnostic, I also considered the F-statistic for the first stage model. Although this diagnostic cannot be calculated using the standard ivprovit method in STATA, it is possible to calculate it using ivreg2, which produces useful diagnostic results for the first stage equation (although the results for the second stage are meaningless because the dependent variable is dichotomous and are not reported). The F statistic for the first stage is 28.65, well above the suggested value, with a p value of $< .0001$.

In addition, gross domestic product per capita and population both performed as expected. The outcome for the democracy variable is not statistically significant. On the

Table 2: First Stage Regression of Rainfall and Humanitarian Aid for Instrumental Variable Probit

Variable	Coefficient	Std. Err.
Rainfall Data	-0.268**	0.040
Log GDP per capita	-0.561**	0.076
Log Population	0.148**	0.056
Democracy	-0.010	0.014
Territorial Control	-0.030	0.170
Rebel Political Wing	0.528**	0.154
Rebels Weaker	1.520**	0.575
Battle Deaths	0.016	0.052
Intercept	1.406	1.295
N	1322	
R^2	0.174	
$F_{(9,1112)}$	25.944	

Significance levels : † : 10% * : 5% ** : 1%

one hand, there have been arguments that democracies are more likely to receive aid from donors, who support their good governance, but on the other hand there are arguments that democracies are less likely to need aid in the first place because they are better able to respond to the crises that might presuppose a need for aid. I also confirm the suitability of rainfall as a good instrument by checking the p value on the chi squared value from the Wald test of exogeneity from the instrumental variable probit. This value fails to reach statistical significance. While this raises a question about the necessity of utilizing an instrumental variable, the point estimates from the instrumental variable are still consistent, although the standard probit regression is likely to have smaller standard errors (STATA Manual 2013, pg. 6)

Finally, although the exclusion restriction cannot be tested empirically or statistically, the above analysis about the lack of a strong relationship between rainfall and conflict indicates that the impact of rainfall on civil wars can be felt exclusively through the intermediary step of humanitarian aid, especially as it relates to the duration of conflict.

6.2 Instrumental Variable Probit for Duration Analysis

After a suitable instrument is found, an instrumental variable probit can be used to determine which variables have an impact on civil war duration. Because the probit analysis does not take into account the passage of time, it is necessary to account for that when determining the relationship between causal factors and the dependent variable, which is the end of a conflict.

6.2.1 Cubic Time Polynomials in Probit Analysis

One method that allows probit regressions to be used for duration analysis is to use cubic time polynomials. Carter and Signorino (2010) advocate this approach over time dummies or splines. While the number of time polynomials to use is arbitrary, Carter and Signorino suggest using three, as it captures the underlying mechanism common to a number of potential duration models (i.e. Weibull, log-logistic, log-normal, Cox proportional hazard model) and there is less concern about overfitting. The value for the time cubed polynomial is logged in order to adhere to the assumptions of the probit model.

6.2.2 Results of Instrumental Variable Probit

Calculating the relationship between various variables and civil war duration is a two step process. I have previously calculated the predicted amount of humanitarian aid expected for each country. Using the predicted humanitarian aid levels from the instrumental variable, I then use a probit, along with the cubic time polynomials, to calculate the relationship between the variables of interest and civil war termination. Standard errors are calculated by bootstrapping in STATA.

For the main variables of interest, humanitarian aid and the interaction effect, the result is not statistically significant. A number of other variables perform as expected in the instrumental variable probit. A rebel political wing is associated with a shorter conflict.

Table 3: Instrumental Variable Probit with Political Wing Interaction

Variable	**Coefficient**	**Std. Err.**
Humanitarian Aid (Predicted)	-0.020	0.118
Rebel Political Wing	0.621*	0.285
Political Wing*Aid Interaction	-0.167	0.123
Log GDP per capita	-0.163	0.099
Log Population	-0.114**	0.036
Altered Polity Score	-0.020*	0.009
Territorial Control	-0.377**	0.124
Rebels Weaker	-0.677*	0.321
Battle Deaths	-0.084**	0.032
Time	0.045	0.039
Time Squared	-0.001	0.001
Time Cubed	-0.099†	0.053
Intercept	3.627**	1.021
Humanitarian Aid + Interaction	-0.186	0.096
N	1122	
Log-likelihood	-3040.269	
$\chi^2_{(13)}$	107.903	

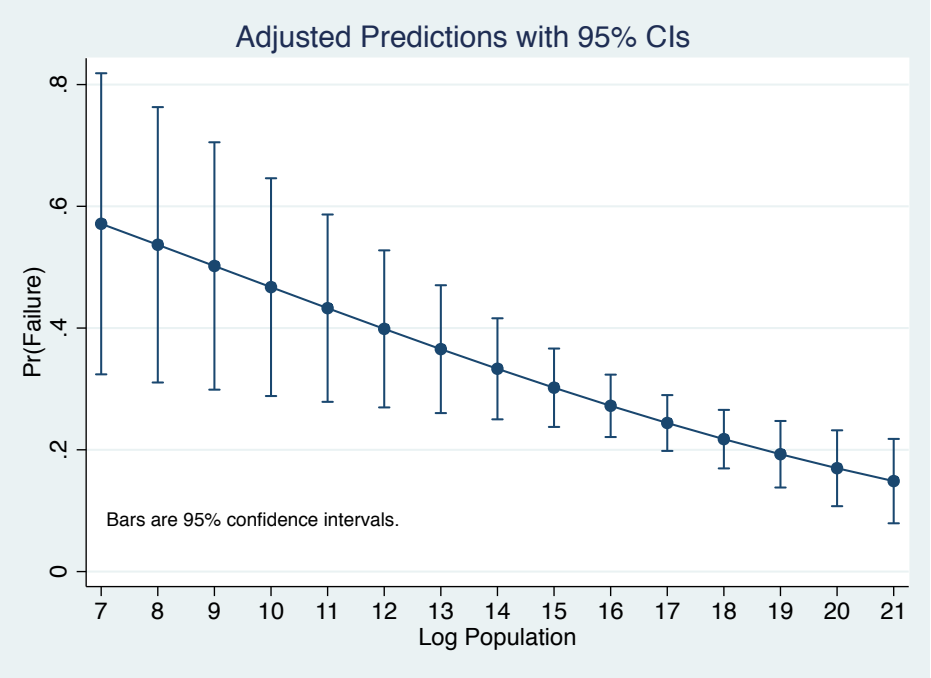
Significance levels : † : 10% ∗ : 5% ∗∗ : 1%

The theoretical underpinning for this is that the existence of a political wing can facilitate negotiations between the rebel group and government or make a rebel group more able and willing to shift from a focus on achieving their goals via violence to instead attempt to achieve their goals via the political process.

Larger populations are found to be associated with longer conflicts. This finding confirms previous research, which has discussed how a larger population means a larger base of people to recruit supporters from and to get assistance from (Cunningham et al 2009, Fearon 2004). Because the results of the regression are the coefficients from a probit, the size of the substantive impact cannot be interpreted directly from the results of the regression table. All that can be seen from the regression table is the sign of the coefficient, which indicates whether the variable makes failure more or less likely, where failure represents an end to the conflict. In order to see the impact of a specific variable, I set every other variable at the mean, the cubic time polynomials at 1, and then plot the likelihood of failure across the range of that variable. For population, the plot shows that as population increases, the

risk of failure (i.e. an end to the war) decreases.

Figure 3: Conflict Termination Rate Based on Population Size



I also produced a marginal effects plot to consider the impact of the interaction effect of the rebel political wing. Because of the insignificance of the variables, there is a large overlap within the confidence intervals for this graphical representation.

Additionally, the cubic time polynomials can also be plotted to show the role of time as it relates to civil war duration. This is done by estimating the model, generating means of the explanatory variables, predicting Y values from the regression, and plotting the relationship between time and outcome over the duration of the sample. The likelihood of civil war termination is highest in the first year of a conflict, and decreases over time. The longer a civil war has gone, the lower is the chance that it will end that year and not continue.

Next, I run the variables as interaction terms to see if signifiers of greed or grievance rebel groups change the impact of humanitarian aid. These additional regressions follow

Figure 4: Impact of Humanitarian Aid on Conflicts Based on Rebel Group Type

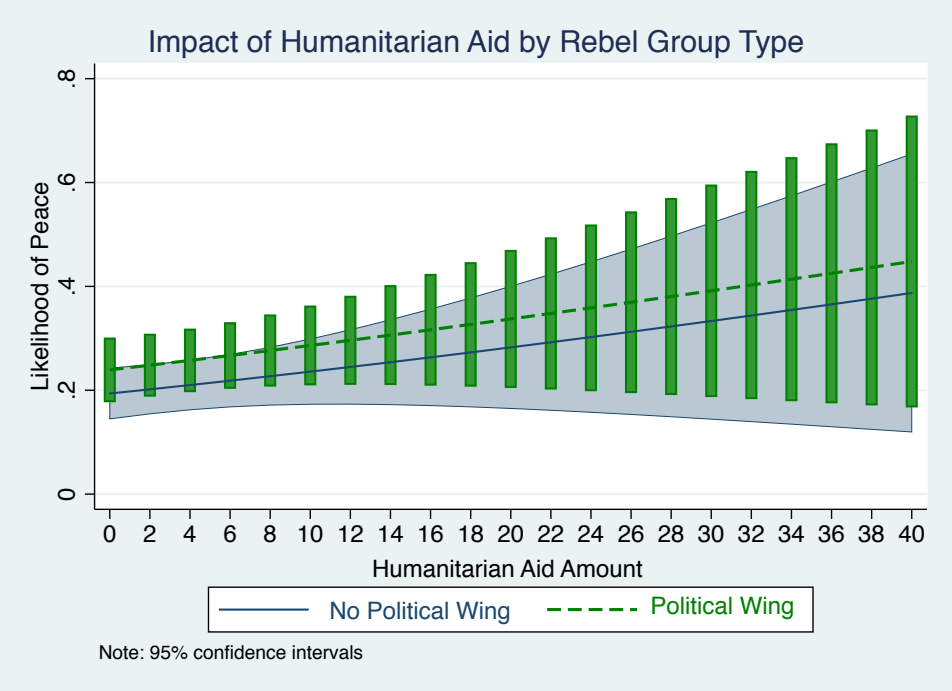
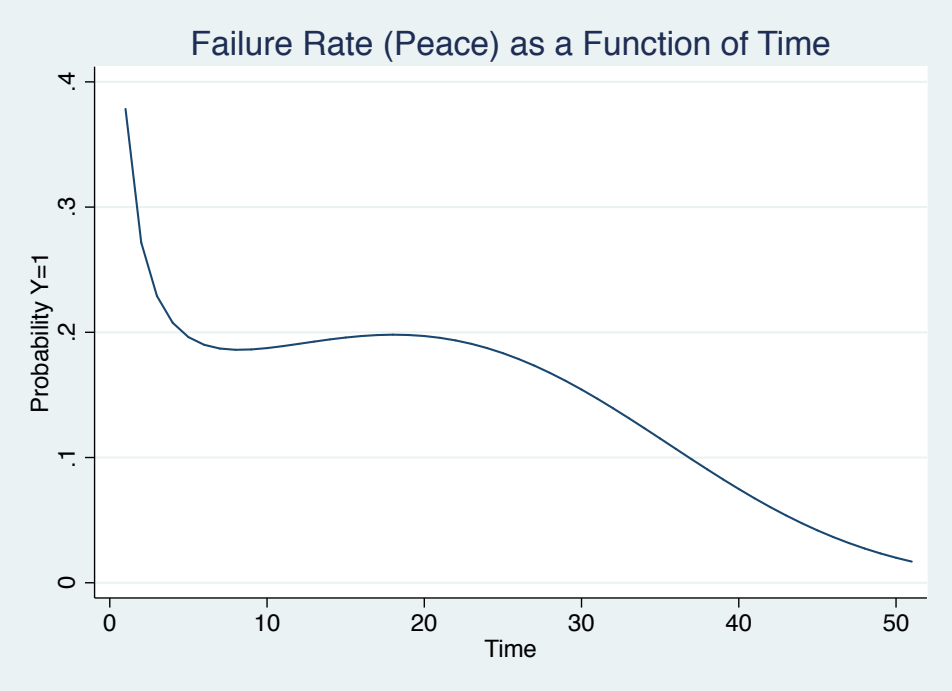


Figure 5: The Relationship Between Conflict and the Passage of Time



the approach of Collier and Hoeffler (2004) and others, who used country-level indicators that could be associated with either grievance or greed/opportunity. Because the impact of

humanitarian aid should differ between rebel groups (or instances of civil wars) that can be differentiated along that aspect, there would therefore be a significant affect when such variables are interacted with humanitarian aid. Because of the limitations on the data that is available for these different variables, and out of a concern with overfitting the model, a variety of these interaction models are run, and the results are presented together in Table 4. I calculate the combined impact of humanitarian aid and the interaction term using the linear combination of estimators option in STATA.

The use of interaction terms with continuous variable is described below, where Y equals the outcome for the regression (i.e. failure, or war termination), and the interaction term is the variable of interest in that particular equation. Each equation also contains a series of control variables and their corresponding beta values, as well as an error term

Y = α + β_1 Humanitarian Aid + β_2Interaction Variable + β_3(Humanitarian Aid * Interaction Variable) + β_n[Control Variables] + ε

Y = α + (β_1 +β_3* Interaction Variable)*Humanitarian Aid + β_2Interaction Variable + β_n[Control Variables] + ε

Y = α + β_1 Humanitarian Aid + (β_2+β_3*Humanitarian Aid)*Interaction Variable + β_n[Control Variables] + ε

A positive value for the effect of the interaction term means that the higher the interaction variable, the greater (more positive) the effect of humanitarian aid on the outcome is. Similarly, the higher the level of humanitarian aid is, the greater (more positive) the effect of the interaction variable on outcome is. The joint effect of both humanitarian aid and the interaction term is calculated using the linear combination estimator option in STATA, and included at the bottom of Table 4. Because these equations are a probit, a higher (positive) value means that a failure (war termination) is more likely, and hence the war is shorter. Each of the models shown in Table 4 contains all the control variables shown in Table 3, along with the additional variables and interaction terms. The interaction between political wing and humanitarian aid that is presented in Table 3 is no longer included as an

Table 4: IV Probit with Interactions

Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Humanitarian Aid	-0.09	-0.28**	-0.07	-0.38**	1.42†	-0.02	-0.34*
Standard Errors	(0.09)	(0.08)	(0.12)	(0.04)	(0.78)	0.09	0.04
Aid*GDP Growth	0.01*						
Standard Errors	(0.01)						
Aid*Mineral Rents		0.07					
Standard Errors		(0.09)					
Aid*Rebel Support		-0.02					
Standard Errors		(0.08)					
Aid*Gov. Support		0.23*					
Standard Errors		(0.25)					
Aid*Mountains			-0.01				
Standard Errors			(0.01)				
Aid*Forests			0.01				
Standard Errors			(0.01)				
Aid*Ethnic Frac.				0.57**			
Standard Errors				(.12)			
Aid*Ethnic Conflict				0.04**			
Standard Errors				(0.08)			
Aid*Gini Coeff.					-0.03*		
Standard Errors					(0.01)		
Aid*Schooling					-0.11		
Standard Errors					(0.10)		
Aid*Oil Rents						-0.01	
Standard Errors						(0.01)	
Aid*Commodities						-0.01	
Standard Errors						(0.01)	
Aid*Rebels Weaker							0.32†
Standard Errors							(0.18)
Observations	1109	958	954	1122	189	847	1122
Aid + Interaction	-0.08	-0.20†	-0.07	0.18†	1.39†	-0.04	-0.02
Aid + Interaction		-0.31**	-0.07	-0.11	.53	-0.03	
Aid + Interaction		-0.05					

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%, All regressions are run with a standard model that contains the basic control variables, as well as the additional variables of interest and the aid interaction term. The combined affect of humanitarian aid and the interaction term is reported below the main results. The order of these sums is based on the order of the interaction terms in the models.

interaction in the models in Table 4.

Model 1 in Table 4 considers the impact of humanitarian aid when it is interacted with economic growth. There are at least two reasons why levels of GDP growth might change the impact that humanitarian aid has on civil war duration. First, changes in the economy represent an opportunity cost for rebels, who must decide whether or not to participate in fighting. Collier and Hoeffler (2004) cite evidence from the Russian civil war where the peasant desertion rate from the army was much higher during the summer. That is because summer was growing season when there was much more income to be lost by farmers who might choose to fight instead (pg. 569). Second, positive growth rates could indicate a shift away from the wartime economy to the peacetime economy, which could either precipitate or indicate that humanitarian aid is providing better economic alternatives as a peacetime resource than it would serve as a lootable commodity as part of the wartime economy. Collier and Hoeffler talk about the impact of growth as being part of the opportunity/economic greed aspect of civil wars in their analysis as they are discussing variables which can be used to differentiate between greed and grievance. Rebels that are motived by political goals or policy reform are less concerned with the shape of the economy or economic trade-offs, while greedy rebels are concerned with the opportunity cost involved when they choose to fight. Therefore, to the extent that looting of humanitarian aid is a higher priority for these greedy rebel groups, the impact of humanitarian aid would have a diminished impact when economic growth is higher. The results from Model 1 show that the while the coefficient on the interaction between growth and humanitarian aid is positive , the joint term for the total impact, found at the bottom of the table is negative. This supports an idea that when groups are oriented toward economic concerns and opportunity costs, as represented by (positive) GDP growth, then humanitarian aid is unlikely to serve to increase the duration of conflict. Instead, this aid can help to bolster the peacetime economy as rebels consider shifting away from wartime looting and opportunism.

The next model considers three possible alternative sources of funding. These are min-

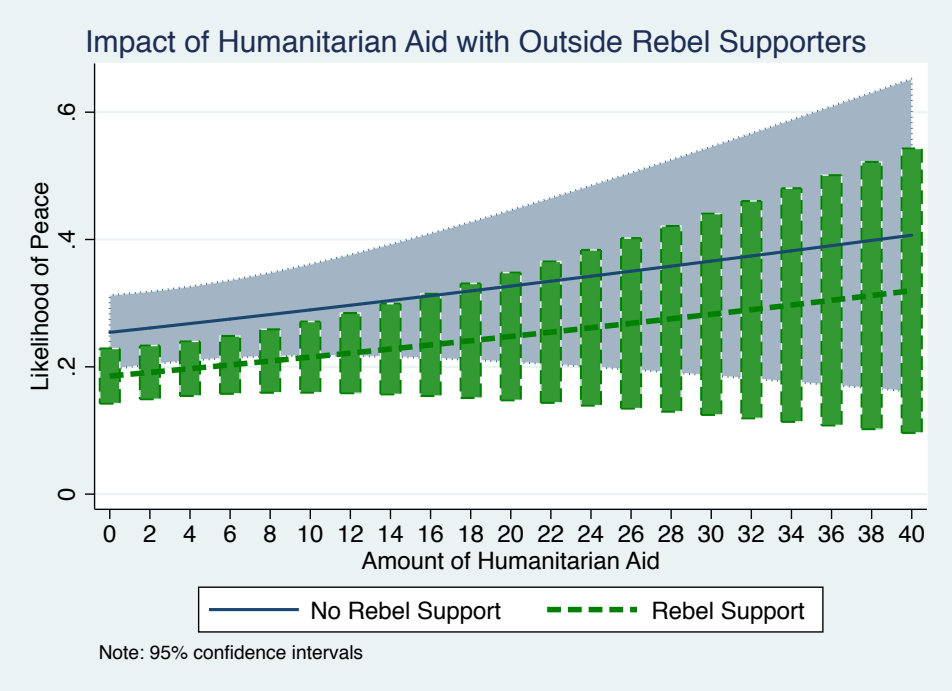
eral rents, such as from gems and diamonds, development aid, outside supporters of rebel groups, and outside supporters of the government. For mineral rents, there is wide agreement that they are a useful source of funding for rebel groups which can work to prolong conflict (Collier & Hoeffler, 2000; Collier & Hoeffler, 2002; Elbadawi & Sambanis, 2000; Ross, 2004; Sambanis, 2000). There are a couple of key differences between possible mineral rents and humanitarian aid. First, mineral rents will likely have much higher value than humanitarian aid, so there would be little need to resort to looting humanitarian aid when lootable diamonds and gemstones are present (Narang 2011). Second, looting humanitarian aid involves stealing from civilians and possibly engendering ill will, while natural resource wealth can be obtained from the environment. That being said, the presence of mineral rents is associated with rebel groups that are economically opportunistic. For those rebel groups, we would expect that therefore aid would be working to prolong conflict as opposed to when ideological groups are present and aid would be shortening conflict. While the coefficient on the interaction term is weakly positive and not statistically significant, the join effect is negative, which is likely driven by the impact of humanitarian aid, which is working to prolong the conflict. The impact of Mineral Rents by itself is -0.456 with a standard error of 0.231. [For space reasons, the coefficients on the variables of interest could not be included in Table 4, but they are reported in the text of the paper and Appendix 9.2 includes the expanded tables showing the interaction effects as well as the coefficients on the variables without interactions.] This is statistically significant at the conventional .05 level, indicating, as expected, that the presence of mineral rents in a conflict works to extend the duration of the fighting.

There are a couple of reasons why outside rebel support might impact the relationship between humanitarian aid and civil war duration. There are both general issues related to any kind of third party intervention that applies to support for both rebel groups and governments, as well as circumstances that are unique to support for rebel groups. First, whenever foreign government are offering support in a conflict to either the rebel or government side,

there is also a chance that they are sending over aid as well in an effort to influence the conflict. While this is more likely to be development aid than humanitarian aid (as it is easier to use development aid to influence the outcome of a conflict), a correlation between third party intervention and amounts of humanitarian aid might still exist. Because of the chance that development aid might be used strategically by these governments, as a robustness check, I ran an additional model that included the amount of development aid a country received, and the results were unchanged. Also, whenever additional parties are involved in the bargaining process it is harder to make an agreement (Cunningham 2010), and the foreign state that is offering support to the rebel group or local government might have different preferences about how the conflict should be resolved. When considering situations where there is outside support for rebel groups, this is more likely in situations where the rebels have some kind of ideological or policy motivation. There is little reason for foreign governments to intervene in order to support a rebel group that is motivated by its own opportunistic looting. If this outside intervention can be taken as a sign that the rebel group is motivated by ideological goals, then based on the theory of this paper, humanitarian aid will work to reduce the duration of the conflict for those rebel groups. The coefficient on the interaction term between Rebel Support and Humanitarian Aid is negative, as is the joint effect, which is statistically significant. The marginal effect of this interaction between rebel support and humanitarian aid can also be represented graphically. The results for this variable do not confirm the theoretical predictions, as rebels that are receiving outside support have conflicts of longer duration. The coefficient on the Rebel Support variable was negative (-0.173) as expected, although it had a p-value of 0.431. In theory, outside intervention in support of the rebels should prolong the duration of the conflict by strengthening the rebel group and producing a “hurting stalemate” or “forecasting errors”.

Third party support for the government, on the other hand, should increase the potential

Figure 6: Impact of Humanitarian Aid on Conflicts Based on Rebel Group Support



imbalance in favor of the government and against the rebels. In that situation, the potential for humanitarian aid to serve as a lootable resource for rebels would be particularly important as a way to counteract this imbalance. A number of researchers have used the assumption that rebels start out as much weaker than the government and have to prevent an early defeat that would end the conflict (Mason and Fett 1996; Mason, Weingarten, and Fett 1999). In those situations, humanitarian aid could present a lootable resource for such rebel groups. The Government Support variable, by itself, has a coefficient of -0.748 and a standard error of 0.253, which produces a p values less than 0.01. This means that third party support for the government works to extend the duration of conflict. Although this third party support might increase the imbalance in favor of the government, there are a number of countervailing factors, including the increased difficulty in reaching a deal with multiple veto players. Third party support for the government can also insulate the government from the costs of war that would be born by the government and reduce the level of taxing of citizens that is required, which would free the government to fight longer. The interaction term is positive and because the Government Support variable is dichotomous,

the interpretation is rather simple, and the presence of humanitarian aid works to reduce the length of conflict in situations where there is outside support for the government.

I included two variables related to terrain in Model 3 because of a possible impact on duration. These variables are coded based on the percentage of mountains or forest in the conflict zone. Neither are statistically significant as individual terms, or as interaction terms, and the joint effect with humanitarian aid is also not statistically significant.

Ethnic fractionalization and ethnic conflict have both been studied in the civil war literature as important factors that might influence conflict duration or might impact the relationship that humanitarian aid has on duration. Collier and Hoeffler (2004) argue that social cohesion is important for rebel groups, and that ethnic diversity can complicate recruitment efforts, and that this can limit the opportunities for rebellion. Ethnic diversity is also associated with ethnic divides and ethnic based inequality, which Collier and Hoeffler argue can relate to objective grievances, and therefore spawn rebel groups that are motivated by a desire for political changes. Collier, Hoeffler, and Soderbom (1999) find that the relationship is non-monotonic, and that mildly heterogeneous societies have the longest civil wars. This could be because societies in the middle area have conflicts that develop along ethnic lines, while states that have very high or very low levels of ethnic diversity tend to produce conflicts along ideological lines, which are shorter in nature. Others have disputed the role of ethnic diversity in violence (Fearon and Laitin 2003; Laitin 2001). Beyond questions of ethnic diversity in a society, there is also a question about whether conflicts that are ethnic conflicts are different than other types of conflicts. These conflicts might be more likely to be ideological in nature, and more likely to see an all or nothing solution (Kaufman 1996; Samabanis 2001). Importantly, these ethnic rebel groups are probably unlikely to need to make use of lootable humanitarian aid as a resource, as they can rely on an ethnic base to sustain them, and they would be particularly concerned that the palliative role of humanitarian aid might interfere with their efforts at mobilization. The presence of humanitarian aid would therefore work to decrease the duration of ethnic based conflicts.

The data on whether a conflict is an ethnic conflict is from Cunningham, Gleditsch, and Salehyan (2009) and is a dichotomous variable.

If Collier and Hoeffler are right, that ethnic diversity presents an opportunity problem, then an infusion of humanitarian aid could represent a particularly useful resource that rebel groups operating under the constraint of ethnic heterogeneity could make use of. If, on the other hand, conflicts in ethnically heterogeneous societies are more likely to be ideological nature, then humanitarian aid should have a palliative role, similar to the effect described for conflicts that are specifically ethnic in nature.

Both ethnic fractionalization and ethnic conflict have positive interaction terms that are statistically significant. The coefficient on ethnic fractionalization by itself is also statistically significant, and negative (-1.093). The positive coefficient on the ethnic conflict and humanitarian aid interaction term supports the idea that conflicts which are defined as being based on ethic concerns are likely to see a calming affect from humanitarian aid. These rebel groups will not necessarily have a strong need to loot resources to support themselves (because they have an ethnic base that can do so), and the delivery of aid to affected minority populations can interfere with recruitment.

I also included two variables that could be operationalized to indicate the likely opportunity costs facing potential rebels: the gini coefficient in the country and the average amount of schooling for 25 year old men. These measures are tricky because they have been used both in situations involving economically motivated rebels as well as grievance motivated rebels. They can be used to make inferences about how interested rebels might be in pursuing economic gains from wartime looting. But the same two measures have also been used in other research to indicate that inequality or lack of opportunity within a country might have led to grievance among a population that is motivating them to fight. Because of an extremely limited amount of data for these variables, the model was run on a dramatically reduced sample, which was likely unrepresentative of the global population of civil wars. Because of this, I cannot draw any firm conclusions about how these particular

variables might impact the relationship between humanitarian aid and conflict duration.

The next model takes into account oil rents and commodity exports. These resources offer potentially contrasting views about how they should impact conflict and what kinds of rebel groups would be most likely to be active in countries with those resources. Oil rents are only valuable to the group that controls the state, so that means rebel groups with long time horizons, and also rebels that are interested in winning the war and seizing the state (as opposed to rebels who would prefer to continue wartime looting). It would be extremely unlikely that a rebel group would attempt to mount a rebellion for the sole purpose of seizing the state and profiting from future oil revenues, because of the high costs involved in winning such a war and the low probability of success. With primary commodities, on the other hand, they have immediate value to rebels and are easy to loot and steal. The presence of lootable primary commodities is not a clear and strong indication that the rebel group is likely to be oriented by economic opportunism. Politically motivated groups also are in need of a source of funding, and so they can make use of the same resources. Weinstein (2007) has noted that in the presence of highly valuable and lootable resources, there is likely to be a crowding out effect and that economically opportunist actors are more likely to succeed. Using measures for oil rents and commodity exports, I consider these possible relationships. The coefficients on each of those individual terms are not statistically significant, as well as for the interaction terms, and the joint affect of humanitarian aid and the interaction term.

Last, I considered a situation where the rebel group begins weaker than the government. While this is the assumption of some conflict models and previous research, Cunningham, Gleditsch, and Salehyan have a variable that makes this explicit. In these situations, humanitarian aid should be especially important as a resource that these rebel groups can make use of to strengthen themselves and help to prevent an early defeat. The positive coefficient on the interaction term indicates the opposite, that humanitarian aid is working to decrease the duration of these conflicts, by causing the failure event (peace) to occur sooner. This

effect is only significant at a .10 p value level. Also, the coefficient on the Rebels Weaker variable is negative (-0.978) with a p-value less than .01, so as a general affect, coding a rebel groups as weaker is correlated with wars of longer duration.

For the seven models that were calculated with interaction terms, humanitarian aid has a negative and statistically significant coefficient in three of the regressions. This confirms previous research about how the presence of aid can prolong conflict, irrespective of any other factors (Nunn and Qian 2012; Narang 2011). I discount the single regression that had a positive coefficient because of the small and unrepresentative sample size. Attempts to interact humanitarian aid with additional variables which could indicate either political oriented or economically opportunistic rebel groups had mixed and inconclusive results.

7 Analysis of Civil War Outcomes Using Competing Risks

The theoretical understanding about the differences between groups that are primarily motivated by economic opportunism/greedy motivations or that are seeking political change leads to different predictions about the outcomes of these civil wars. Regarding duration, there are a subset of rebel groups that would like to see civil wars extended, because they benefit as long as the fighting is ongoing. For these rebel groups, it is hard to make concrete predictions about how variables might impact civil war outcomes, because these rebel groups are not oriented toward either military victory or successful negotiations. For other rebel groups, they have clearer preferences over possible outcomes and this can be combined with the logic of the bargaining model of war and the likely impact of humanitarian aid to make predictions about how this aid will impact civil war termination.

7.1 Modeling Civil Wars Using Competing Risks

It is important to keep in mind that the length of a civil war is determined by the time

until the civil war termination, but that there are multiple ways that a civil war can end. This means that a civil war which terminates with one particular kind of outcome therefore prevents the war from terminating in some other way. A competing risks model is an appropriate way to explain how these different outcomes are impact by the different variables in the model and how they compete with each other.

In this project, civil wars are conceptualized as government-rebel dyad years. Each year, the dyad can continue fighting, or it can come to some kind of possible outcome that terminates the war. The possible outcomes are a government victory, a rebel victory, a formal agreement, or a transition to a low level of activity, that falls below the specific cut-off for the number of battle deaths to be classified as a civil war. If any of these outcomes are achieved, it terminates the conflict, and none of the other outcomes can be reached for that conflict. Within civil wars, the various explanatory variables can also have different impacts on the possible outcomes. For example, Balch-Lindsay, Enterline, and Joyce (2008) ran a competing risks model on civil war outcomes. They found that higher civil war costs (as operationalized by battle deaths), was associated with an increase in the likelihood that a negotiated settlement could be reached, but a decrease in the likelihood that the rebels would have defeated the government.

7.2 Competing Risks Models

Competing risks models are useful when there are multiple ways that an event can end, or fail, and these different types of failure events are recorded. These different failure types are said to compete with each other because only one of them can occur first and end the event of interest. Unlike with a traditional Cox model that is used for questions about duration without a competing risk component, competing risks models can be used to determine the cause-specific hazard function and cumulative incidence function.

One approach to competing risks models was developed by Fine and Gray (1999). They used a semi-parametric model to determined the cumulative incidence functions. This is

done by first defining a subhazard function for failure cause i as

$$\bar{h}_i(t) = lim_{\triangle t \to 0} = \frac{P\{t \leq T < t + \triangle t,\ failure\ from\ cause\ i \mid T > t\ or\ (T \leq t\ and\ not\ cause\ i)\}}{\triangle t}$$

For cause i, the subhazard is the probability of failure, at that time, t, from cause i, as long as there has not been a failure before time t. This also allows for the calculation of the cumulative incidence function, which is, at time t, for cause i, the probability of failing from cause i before (or up to) time t. Mathematically, this is written as

$$CIF_i(t) = 1 - exp\{-\int_0^t \bar{h}_i(u)du\}$$

Each possible failure outcome is treated individually and its likelihood of occurring is calculated as opposed to the alternative options. The outcome for each of these regressions gives the results in terms of subhazard ratios (SHR). With a subhazard ratio greater than one, it means that higher values of this variable are associated with higher incidence of the failure type, controlling for the other covariates and the fact that the other types of failures can occur, while a SHR less than one indicates the opposite. The calculations for the competing risks models are done in STATA using the stcrreg command.

7.3 Hypotheses, Data, and Model

In the theory section, two hypotheses were outlined regarding how humanitarian aid would impact different types of rebel groups. As was previously noted, humanitarian aid should be beneficial to groups that are motivated by greed or opportunistic looting, and it will be harmful to rebel groups that are seeking political changes or policy goals.

7.4 Results and Analysis

The first step in the competing risks analysis is to consider a baseline model which in-

Table 5: Civil War Outcomes

Result	N	Percentage
Agreement	84	20.4
Government Victory	96	23.3
Rebel Victory	51	12.4
Low Activity	181	43.9
Total	412	100

corporates the control variables that will be used throughout the competing risks analysis. The results for a competing risks analysis represent four different models, one for each of the four possible outcomes which are being compared against each other. The same instrumental approach from the duration models was used to predict the amount of humanitarian aid using rainfall data as an instrumental variable. Table 6 contains the results of this baseline competing risks model. This model also uses the presence of a political wing as a way to distinguish between groups that are primarily motivated by political grievances or who are seeking the opportunity to engage in opportunistic looting.

For the main variable of interest, humanitarian aid, only one of the four possible outcomes is statistically significant. The results in Table 6 show that humanitarian aid is associated with a decrease in the expected amount of time until a rebel victory. One possible reason for this is that humanitarian aid could work to decrease the cost of fighting for both the rebels and the government. To the extent that money (and aid) is fungible, when donors send aid it could allow government to shift money toward fighting a conflict which otherwise would have had to go to providing for the welfare of the population. If the costs of conflict are a bigger factor for the government than it is for rebels, then decreasing theses costs extend the expected amount of time until a rebel victory. This possible explanation make sense in light of the finding that humanitarian aid also extends the duration of civil wars. There are no statistically significant results from the interaction between aid and a rebel political wing.

The results of the various control variables in the model perform as expected, and a number of the statistically significant results can be highlighted. A higher GDP per capita

Table 6: Competing Risks Model with Political Wing and Aid Interaction

Variable	**Agreement**	**Gov Win**	**Rebel Win**	**Low Activity**
Humanitarian Aid (predicted)	1.369	1.004	$0.552^{\dagger}$	1.269
Standard Error	(0.382)	(0.256)	(0.194)	(0.303)
Political Wing	1.189	1.161	2.549	1.862
Standard Error	(1.075)	(0.739)	(2.494)	(1.139)
Aid*Political Wing Interaction	0.838	1.029	1.053	0.739
Standard Error	(0.285)	(0.242)	(0.483)	(0.156)
log GDPpc	1.165	1.133	0.549^{*}	1.030
Standard Error	(0.237)	(0.243)	(0.171)	(0.188)
log Population	0.766^{*}	0.977	0.839	1.154^{*}
Standard Error	(0.084)	(0.112)	(0.160)	(0.092)
log Democracy	1.153^{*}	0.932^{**}	0.929	0.982
Standard Error	(0.089)	(0.026)	(0.930)	(0.021)
Territorial Control	2.108^{*}	0.815	0.318^{*}	0.922
Standard Error	(0.649)	(0.254)	(0.180)	(0.266)
log Battle Deaths	1.143	0.828^{**}	1.101	$0.882^{\dagger}$
Standard Error	(0.116)	(0.064)	(0.141)	(0.069)
Rebels Weaker	1.044	1.725	0.867^{**}	$2.856^{\dagger}$
Standard Error	(0.505)	(0.883)	(0.046)	(1.705)
Humanitarian Aid + Interaction	1.147	1.033	0.582	0.938
Standard Error	(0.394)	(0.314)	(0.279)	(0.272)
N = 1170				

Significance levels : $\dagger$: 10% $*$: 5% $**$: 1%, All regressions are reported with subhazard ratios.

is associated with a longer time until rebel victory. This higher GDP per capita is often used as a proxy for state capacity which should translate into a stronger military that would be more capable of defeating rebel groups. A larger population is associated with a longer time until a formal agreement and a shorter amount of time until the outcome of conflict continuing, but at a low activity level which drops below the standard 25 battle deaths per year threshold. This corresponds to rebel groups that find it easier to hide out among a larger population and resist defeat, would not find it necessary to reach an agreement, and would have a large base of population to recruit potential supporters from. Democracy is associated with a longer amount of time until government victory, which often relates to democratic norms and human rights protections which make it hard for a democratic regime to fully defeat a rebel force. Territorial control is associated with a shorter amount of time until formal agreement, and a longer amount of time until rebel victory. This corresponds to the idea that weaker rebel forces that have a base of territorial control may not be strong enough to overthrow the government, but they are able to keep fighting from their safe haven and can eventually force an agreement with the government. Higher numbers of battle deaths are associated with an increase in the amount of time until government victory, as governments that are facing difficult and painful ongoing conflict that must seek out some other solution rather than continuing to fight if casualties are mounting. Finally, as is expected, weaker rebel group are correlated with an longer amount of time until they become victorious, relative to other competing outcomes.

The existence of a rebel political wing does not produce statistically significant results as a singular term or in the interaction with humanitarian aid, so no conclusions can be drawn about whether the presence of such an attribute affects the impact of humanitarian aid on civil war duration. As with the previous duration models, I now consider a number of other variables which are likely to be indicative of rebel groups that are primarily motivated by political grievance or economic opportunism or which are likely to have an interactive

Table 7: Competing Risks Model with GDP Growth and Aid Interaction

Variable	**Agreement**	**Gov Win**	**Rebel Win**	**Low Activity**
Humanitarian Aid (predicted)	1.370	0.865	0.219**	1.473*
Standard Error	(0.345)	(0.256)	(0.080)	(0.249)
GDP per capita Growth (%)	1.031	1.117	0.975	0.986
Standard Error	(0.045)	(0.096)	(0.032)	(0.041)
Aid*Growth Interaction	.979	0.980	1.000	1.013
Standard Error	(0.020)	(0.033)	(0.013)	(0.017)
Humanitarian Aid + Interaction	1.341	0.847	0.219**	1.492*
Standard Error	(.344)	(.253)	(0.081)	(0.263)
N = 1150				

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%, All regressions are reported with subhazard ratios.

effect on the relationship between humanitarian aid and civil war duration.

Next, I consider GDP per capita growth. Results from the main variables of interest from that regression are presented in Table 7. As with the political wing variable, there is not clear evidence of a relationship for this variable to any of the four possible outcomes or evidence of an interactive affect with humanitarian aid. The results from this model repeat the same results regarding the relationship between humanitarian aid and rebel victory, demonstrating that there is an increase in the amount of time until rebel victory for the humanitarian aid variable. This evidence refutes the idea that humanitarian aid is beneficial to rebel groups as a lootable resource, and instead suggests that this humanitarian aid is serving some kind of positive benefit for the government and potentially provides support for the idea that delivery of this aid reduced grievances among the population. The statistical significance for the low activity outcome can relate to the ability of humanitarian aid to work to sustain a conflict and help to lower the costs for both sides so that they can continue to fight for longer periods of times.

Mineral rents is another variable to consider for the competing risks model. As expected, these mineral resources are strongly associated with a decrease in the amount of time until rebel victory. Rebel groups can benefit greatly from the presence of lootable

Table 8: Competing Risks Model with Mineral Rents and Aid Interaction

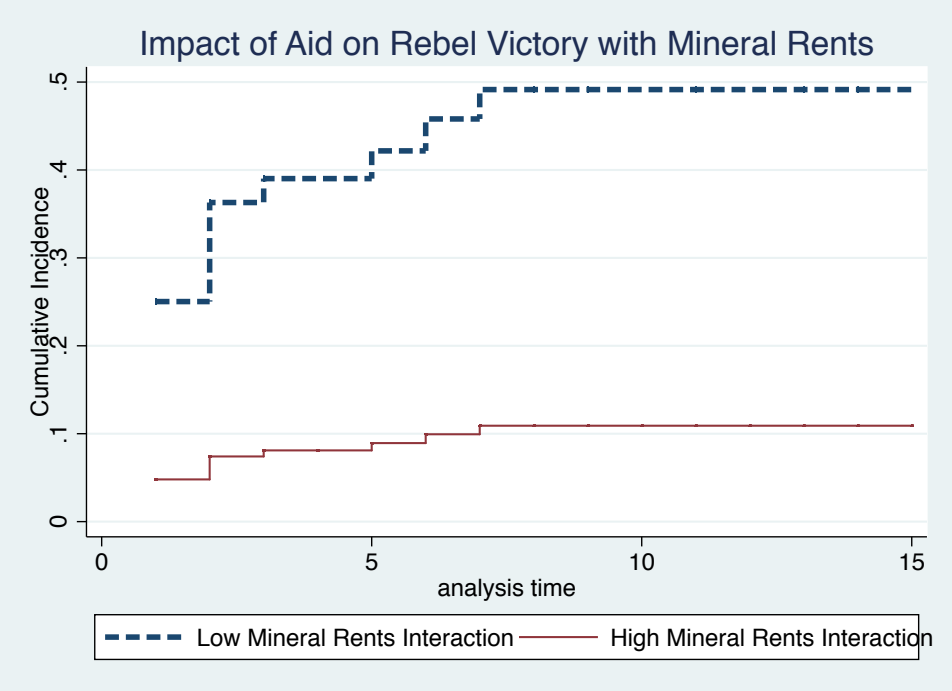
Variable	**Agreement**	**Gov Win**	**Rebel Win**	**Low Activity**
Humanitarian Aid (predicted)	1.231	1.353	0.254^{**}	1.218
Standard Error	(0.332)	(0.429)	(0.111)	(0.277)
Mineral Rents	1.031	0.461	1.932^{*}	0.680
Standard Error	(0.597)	(0.274)	(0.504)	(0.305)
Aid*Mineral Interaction	0.897	1.165	$0.673^{\dagger}$	1.058
Standard Error	(0.223)	(0.279)	(0.154)	(215)
Humanitarian Aid + Interaction	1.106	$1.576^{\dagger}$	0.171^{**}	1.289
Standard Error	(0.286)	(0.085)	(0.085)	(0.300)
N = 1064				

Significance levels : $\dagger$: 10% $*$: 5% $**$: 1%, All regressions are reported with subhazard ratios.

resources as a funding mechanism during civil wars. It is also possible to represent the results of competing risks models graphically, by converting the subhazard ratios to the cumulative incidence function. This cumulative incidence function sets variables of interest at specific values, while others are held at their mean. Somewhat surprisingly, the interaction between aid and mineral rents is less than one for a rebel win, and so when the results of this model are shown graphically, the likelihood of a rebel victory is lower for higher possible values of of the mineral rents variable. In that graph, the amount of humanitarian aid is held constant while the value for the interaction term and amount of mineral rents is varied. In theory, mineral rents should be a much more valuable and efficient funding mechanism than humanitarian aid would be, although rebel groups that are open to funding themselves via looting of minerals would also benefit from being able to loot humanitarian aid.

Next, I consider outside rebel support and its impact on the possible civil war outcomes, as well as the interactive impact on humanitarian aid. These results are consistent with ideas about the expected impact of third party support for rebel groups. Outside support for rebels increases the expected amount of time until a government victory, relative to

Figure 7: Cumulative Incidence Function of Rebel Victory with Aid and Mineral Rents



the other options, and it increases the likelihood of the low activity outcome. This outside support can occur in a situation where it is not enough to allow for a rebel victory, but also prevents the rebel defeat, making an extended period of low level conflict a more likely outcome.

When considering the impact of government support, there are a few variables in Table 10 that achieve statistical significance at the .10 level, including the increased amount of time for a government win or rebel win, and the stronger finding about the expected decrease in the amount of time until a low activity outcome. This corresponds to previous analysis about how this outside intervention can lead to a prolonged conflict. There are also probably selection effects occurring when outside actors decide which conflicts to intervene with, although untangling that bias in interventions is outside the scope of this project. The significance of the interaction between government support and humanitarian aid leading to a decreased likelihood of the low activity outcome is noted, although there are no previous strong theoretical predictions about the relationship and that particular outcome.

Ethnic conflict and ethnic fractionalization both fail to produce strong and meaningful

Table 9: Competing Risks Model with Rebel Support and Aid Interaction

Variable	**Agreement**	**Gov Win**	**Rebel Win**	**Low Activity**
Humanitarian Aid (predicted)	1.023	1.114	0.299**	1.568*
Standard Error	(0.224)	(0.237)	(0.133)	(0.307)
Rebel Support	1.172	0.300*	0.810	2.154*
Standard Error	(0.834)	(0.181)	(0.647)	(1.081)
Aid*Rebel Support Interaction	1.261	1.110	0.901	0.718
Standard Error	(0.353)	(0.262)	(0.401)	(0.131)
Humanitarian Aid + Interaction	1.291	1.237	0.269**	1.125
Standard Error	(0.321)	(0.298)	(0.089)	(0.199)
N = 1170				

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%, All regressions are reported with subhazard ratios.

Table 10: Competing Risks Model with Government Support and Aid Interaction

Variable	**Agreement**	**Gov Win**	**Rebel Win**	**Low Activity**
Humanitarian Aid (predicted)	0.809	1.011	0.317**	1.639*
Standard Error	(0.231)	(0.230)	(0.101)	(0.327)
Government Support	0.451	0.361†	0.034†	3.521*
Standard Error	(0.347)	(0.219)	(0.042)	(1.777)
Aid*Gov Support Interaction	1.685†	1.349	1.819	0.645*
Standard Error	(0.539)	(0.336)	(0.013)	(0.122)
Humanitarian Aid + Interaction	1.363	1.365	0.576	1.058
Standard Error	(.326)	(.339)	(0.081)	(0.192)
N = 1142				

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%, All regressions are reported with subhazard ratios.

Table 11: Competing Risks Model with Ethnic Conflict and Aid Interaction

Variable	**Agreement**	**Gov Win**	**Rebel Win**	**Low Activity**
Humanitarian Aid (predicted)	$1.434^{\dagger}$	1.040	0.196^{**}	$1.060^{\dagger}$
Standard Error	(0.306)	(0.231)	(0.069)	(0.410)
Ethnic Conflict	0.885	0.817	0.273	0.402
Standard Error	(0.872)	(0.096)	(0.359)	(0.328)
Aid*Ethnic Conflict Interaction	1.675	1.019	1.081	1.320
Standard Error	(0.588)	(0.274)	(0.465)	(0.307)
Humanitarian Aid + Interaction	2.340^{*}	1.059	0.212^{**}	$1.397^{\dagger}$
Standard Error	(0.977)	(.300)	(0.073)	(0.304)
N = 1170				

Significance levels : † : 10% $*$: 5% $**$: 1%, All regressions are reported with subhazard ratios.

Table 12: Competing Risks Model with Ethnic Fractionalization and Aid Interaction

Variable	**Agreement**	**Gov Win**	**Rebel Win**	**Low Activity**
Humanitarian Aid (predicted)	5.297^{**}	0.440^{*}	0.125^{**}	2.104^{*}
Standard Error	(3.288)	(0.174)	(0.088)	(0.692)
Ethnic Fractionalization	137^{*}	0.074^{*}	0.220	10.738
Standard Error	(320)	(0.045)	(0.418)	(12.737)
Aid*Fractionalization Interaction	$.126^{*}$	3.606^{*}	2.580	0.557
Standard Error	(0.108)	(1.924)	(2.889)	(0.250)
Humanitarian Aid + Interaction	0.669	$1.587^{\dagger}$	0.321	1.172
Standard Error	(.237)	(.465)	$(0.204)^{*}$	(0.293)
N = 1170				

Significance levels : † : 10% $*$: 5% $**$: 1%, All regressions are reported with subhazard ratios.

results, as shown in Table 10 and Table 11. My expectation was that higher measures of ethnic fractionalization would be associated with a decrease in the amount of time until a government victory (because of the difficulty of building a multi-ethnic coalition), although the opposite was the case. As before, humanitarian aid is associated with an increase in the amount of time until a rebel victory for both ethnic measures, and an decrease in the amount of time until the outcome could be classified as crossing over into the low activity threshold. This is to be expected if the presence of humanitarian aid allows for a shift from the outright conflict of civil war to a less aggressive version of fighting that focuses on wartime profiteering and looting, but during which rebels do not have any distinct interest in directly fighting the state. To the extent that ethnic fractionalization is associated with grievance based conflict, the result of the interactive term for government win (3.606) corresponds to the idea that humanitarian aid would be able to play an especially useful palliative role in those conflict, hence increasing the likelihood of government victory.

Table 13: Competing Risks Model with Oil Rents and Aid Interaction

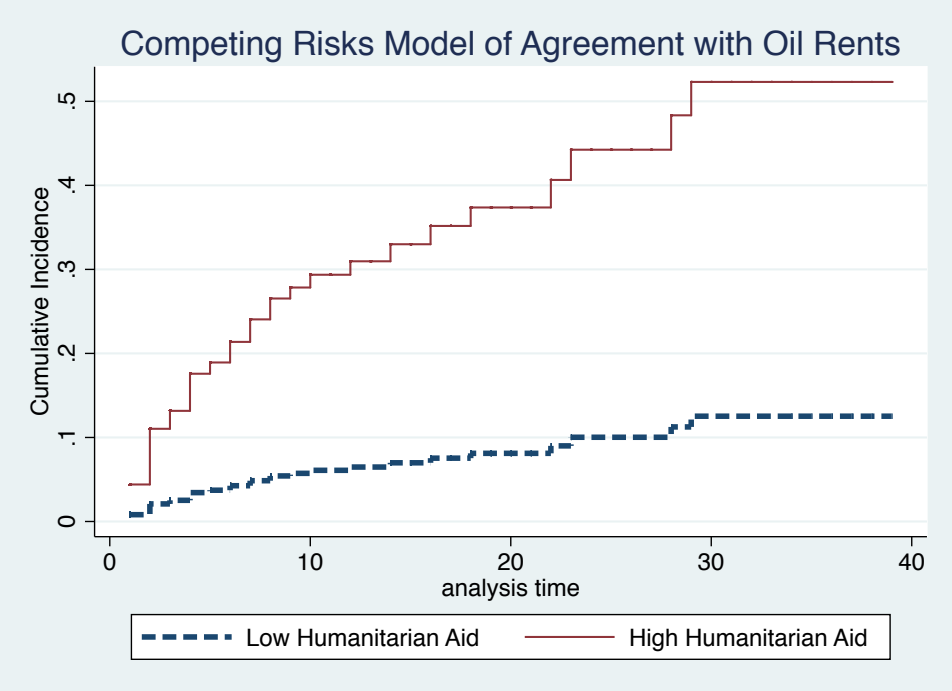
Variable	**Agreement**	**Gov Win**	**Rebel Win**	**Low Activity**
Humanitarian Aid (predicted)	2.352**	1.012	0.155**	1.280
Standard Error	(0.714)	(0.264)	(0.075)	(0.333)
log Oil Rents	0.924	1.125	1.005	0.999
Standard Error	(0.085)	(0.115)	(0.092)	(0.070)
Aid*Oil Rents Interaction	1.057	0.931†	0.997	1.023
Standard Error	(0.038)	(0.037)	(0.678)	(0.030)
Humanitarian Aid + Interaction	2.485**	0.949	0.155**	1.316
Standard Error	(0.795)	(.263)	(0.073)	(0.355)
N = 903				

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%, All regressions are reported with subhazard ratios.

For the models that took into account oil rents and commodity prices, there was support for the idea that humanitarian aid can also increase the likelihood of an agreement. The primary commodity variable failed to reach any statistical significance for the main variables of interest, so the table with results from the oil rents variable is included. As with the previ-

ous model that took into account ethnic fractionalization, the formal agreement coefficient was positive and statistically significant. While the previous duration analysis indicated that humanitarian aid could prolong conflicts, this humanitarian aid also decreases the expected amount of time until a formal agreement can be reached. The magnitude of the impact of humanitarian aid on the increase likelihood of a formal agreement can be shown visually by comparing the likelihood of a formal agreement when humanitarian aid is set one standard deviation above and below the mean and the cumulative incidence function plotted.

Figure 8: Cumulative Incidence Function of Agreement with Aid and Oil Rents



The last competing risks model is regarding the impact of a weaker rebel group, and any interaction that this might have with humanitarian aid. As predicted, the weaker rebels have a an expected longer duration until they would be achieving victory, relative to the other outcomes. These weaker rebel groups are also associated with a decreased in the expected amount of time until the low activity outcome occurs, which makes sense if they would be reluctant to engage in an ongoing fight with the government when they are outmatched by

the government's strength. The interaction terms failed to reach statistical significance at the .05 level for the Rebel Weaker variable.

Table 14: Competing Risks Model with Rebels Weaker and Aid Interaction

Variable	**Agreement**	**Gov Win**	**Rebel Win**	**Low Activity**
Humanitarian Aid (predicted)	0.886	0.424	0.579	2.534*
Standard Error	(0.428)	(0.258)	(0.219)	(1.272)
Rebels Weaker	1.053*	1.822	0.013*	11.133*
Standard Error	(0.027)	(1.931)	(0.029)	(12.927)
Aid*Rebels Weaker Interaction	1.449	1.892	1.747	0.427†
Standard Error	(0.659)	(1.155)	(1.291)	(0.017)
Humanitarian Aid + Interaction	1.284	0.804	1.013	1.084
Standard Error	(.337)	(.227)	(0.873)	(0.261)
N = 1170				

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%, All regressions are reported with subhazard ratios.

Overall, the most consistent results from the competing risks regressions is that conclusion that humanitarian aid leads to an increase in the amount of time until rebel victory, when control for the other outcomes in the competing risks model. Using a rebel political wing as a way to proxy for the difference between rebel groups that are primarily motivated by greed or grievance did not produce statistically significant results. A variety of other country-level variables were considered which could indicate a likelihood that rebel groups were more likely to be motivated by greed or grievance, but they also failed to offer a clear indication of how the impact of humanitarian aid might be affected by the motivation of rebel groups.

8 Conclusion

While many scholars have discussed the importance of rebel group motivation as a

way to understand conflict, this research has suffered from a few flaws. Most importantly, much research used vague or arbitrary proxies to help determine the motivation of rebel groups. This was especially necessary in large N analysis, as there was not good data available on individual rebel groups. Qualitative researchers have made much more progress in examining individual rebel groups in detail to determine what their primary motivations are. This paper extends this research by using data on individual rebel groups to determine how much they are primarily motivated by greed or grievance, which allows for previous theories about greed and grievance to be applied to these individual rebel groups using additional empirical techniques. Because of the differences between rebel groups motivated by greed and grievance, it is possible to develop specific hypotheses about how the presence of aid will impact these different kinds of rebel groups.

Because of the different interests of rebel groups that are primarily motivated by greed or grievance, there is reason to believe that the presence of humanitarian aid would have a different impact on these two kinds of groups. Greedy rebel groups would be more likely to see this aid as a lootable resource which would serve as an additional motivation for them to fight, and it would provide funding which would be helpful for them to extend their conflict against the government. Rebel groups that are primarily motivated by grievance need to be careful about alienating local populations, which could be the result if they steal aid that it intended to alleviate a humanitarian crisis. Additionally, humanitarian aid can help to ameliorate the underlying grievance that is motivating these rebel groups.

Previous research has found inconsistent results regarding the impact of humanitarian aid on civil war duration. Some papers have found empirical support for the idea that aid can serve to prolong conflicts (Nunn and Qian 2012; Narang 2011), while others find the exact opposite, that humanitarian aid will decrease the duration of conflicts (Ree and Nillesen 2009). Nielsen et al (2011) offer a more nuanced approach and find evidence that it is aid shocks which can drive conflict, and this can include large increases or decreases in humanitarian aid deliveries. Savun and Tirone (2011) note that the link between aid and

violence might be driven by democratization, as newly democratizing countries are prone to violence and also receive larger aid allocations.

My findings are somewhat mixed, and offer support for a couple of different perspectives. From the instrumental variable probit models, which consider humanitarian aid's impact on civil war duration, there is limited evidence that humanitarian aid can prolong these conflicts. Across a number of models, the coefficient on the humanitarian aid variable is statistically significant and negative. While practitioners in the aid community are hopeful that humanitarian aid can reduce grievance and bring stability and peace to conflict regions, evidence is accumulating that this aid can instead exacerbate conflicts and prolong the fighting. My research adds additional weight to that concern. The competing risks models show evidence that humanitarian aid is associated with a decreased likelihood of rebel victory, as compared to the other outcomes. Even as humanitarian aid can be a resource that works to prolong the fighting, it still represents either a benefit to the government, or has some other mechanism at work that will harm the rebel groups, perhaps by lowering the grievances of the domestic population or increasing feelings of goodwill for the government. Taken together, these results suggest that the impact of humanitarian aid on conflict is complex.

The existence of a rebel political wing, while it has been cited by other researchers as a meaningful indication of a fundamental commitment that some rebel groups have toward political change, might have been overly broad or crude, and hence failed to provide meaningful results. The approach taken by Collier and Hoeffler (2004), where country level variables were used as indicators of whether rebels were more likely to be primarily motivated by economic opportunism or political grievance also failed to provide conclusive evidence. The economic opportunism model they propose contained primary commodity exports, male secondary schooling, GDP growth, and the size of the population, while the political grievance model contained ethic fractionalization, terrain, and income inequality among other variables. These variables sometimes produced meaningful interactions with

humanitarian aid in the competing risks models, but mostly failed to achieve statistical significance or offered contradictory evidence.

My finding of limited evidence that humanitarian aid works to extend the duration of conflict, regardless of rebel group type could be due to two main reasons. The first reason is that all types of rebel groups might choose to benefit by looting humanitarian aid. Even though politically oriented groups are trying to win the hearts and minds of followers, they might still be willing to steal humanitarian aid that is intended for starving people. And Weinstein's evidence that turning to looting to fund a movement begins to attract common criminals who are only interested in personal gain might be outweighed by the financial payoff that these rebel groups may require to help fend off the state. If that is the case, then politically oriented groups may still decide to loot humanitarian aid, and treat it as a necessary evil. The second reason that it might have been difficult to differentiate between the impact of humanitarian aid on conflict between these groups is that the variable that indicates the presence of a rebel political wing, as well as the other factors that were considered might have failed to accurately distinguish between different types of rebel groups. While the distinction between rebel groups was not an important characteristic that drove the results of this project, my finding about the ability of humanitarian aid to extend the duration of conflict is in line with previous research, and the various control variables that achieved significance in the duration and competing risks models performed as expected.

Relatedly, another reason for the lack of evidence for a distinction between rebel group type and civil war duration and outcome based on the amount of humanitarian aid that is present could be because grievance rebel groups had motivations that were not directly related to humanitarian aid. Rebel groups motivated by grievance might have grievances that are unrelated to humanitarian issues. Conflict over ethnicity, income inequality, or local autonomy can all motivate rebel groups completely independent of any humanitarian issues. If this is the case, then conflict can lead to a large increase in the amount of aid

being delivered to a country, but this aid would have little affect on the rebel group's anger at the government, (or on the local population's grievance as well).

There is also a recent trend of more aid being given by donors that is not captured in the data set being used in this paper. While the DAC includes aid that is given by multilateral groups and NGO's, it does not measure aid that is given by states that are not part of the OECD. In a report on the diversity of donor countries, Harmer and Cotterel (2005), noted the increasing prominence of these non-OECD donors:

> Important donors, such as China, Saudi Arabia and India, are not members of the DAC, and may not follow the major Western states in their rationales for aid interventions, their policy priorities and their choice of response channel. Although trends in financing, including total volumes of assistance, are hard to determine, this set of donors has accounted for up to 12% of official humanitarian assistance in a given year, and their influence in certain crises, such as Afghanistan, North Korea and the occupied Palestinian territories, is significant. (pg. 3)

While the humanitarian aid donations from these non-OECD countries has been small (often well less than 10% of the total), if it has been primarily directed to countries that feature long-running conflicts, it could explain the lack of empirical support for the hypotheses in this paper. While the contemporaneous research on aid has used the same OECD data, new data will be published soon that begins to aggregated the aid giving from non-OECD countries which will allow future work to examine this issue in more detail.

It is also possible that humanitarian aid had the expected impact on rebel groups (i.e. strengthening rebel groups primarily motivated by greed, and weakening rebel groups motivated by grievance), but this result was not visible when examining duration. It is possible that when greedy rebel groups reached a stronger position relative to the government, this increased the likelihood of a deal that offered something of value to the rebels, and led them to terminate the conflict. If, for example, greedy rebel groups were seeking out access to some lootable resource other than humanitarian aid, then a peace deal that offered them some level of regional autonomy or increased access to rent from natural resources might

have terminated the war. This earlier termination that is brought about by the strengthening of a rebel groups would not be apparent in the duration results. Similarly, humanitarian aid might have weakened a rebel group that was primarily motivated by grievance, but not enough to end the conflict. Mason and Fett (1996) note that when there is a particularly lopsided imbalance of power, it can cause an increase in duration because the losing side would prefer to make a deal with any concessions that are offered but the stronger side would prefer to fight for outright victory. If this dynamic was occurring with grievance based groups, it would explain why humanitarian aid might weaken these groups, but not lead to a cessation of violence. While I consider the competing risks model to attempt to determine whether humanitarian is having the predicted effect that my hypotheses suggest, the coding scheme for civil war outcomes may interfere with these results. With only four results to choose from, it is impossible to know whether a formal agreement might have overly favored one side or the other, and when a conflict ends in "low activity", it is hard to know how to interpret that.

It is possible that a more precise measure of rebel group motivation could have offered more precise analysis and uncovered a stronger link between humanitarian aid and civil war duration. It makes more sense to think of rebel groups as having a mix of motivations and existing somewhere on a continuum between pure greed and grievance. Because of the data available, it was necessary to use variables for this project that might not have fully captured the true nature of these groups, and the proxies that were used might have been inadequate.

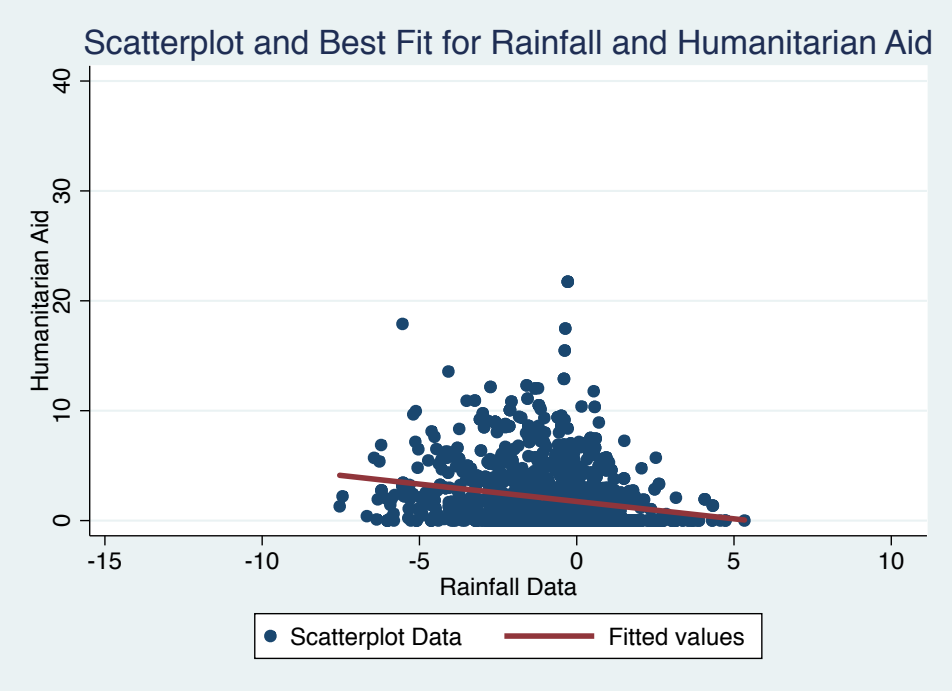
Last, it is possible that rainfall was not a suitable instrumental variable to use. While the diagnostic checks that were run did not present any obvious red flags, the exclusion restriction could have been violated, or other unforeseen issues might have harmed the validity of rainfall as a proper instrument. Concerns about endogeneity in this topic are legitimate, and previous scholarly work which failed to properly control for the possible endogenous relationship may have been flawed.

Further work on this topic will be necessary to explain why previous research has found opposing results regarding the relationship between humanitarian aid and civil war duration.

9 Appendix

9.1 Aid and Rainfall Relationship

Figure 9: Scatterplot Showing Relationship Between Aid and Rainfall



9.2 Extended Results of Instrumental Variable Probit Models with Interaction Terms

Table 15: IV Probit with Interactions

Variable	**(1)**	**(2)**	**(3)**
Humanitarian Aid	-0.09	-0.28**	-0.07
Standard Errors	(0.09)	(0.08)	(0.12)
GDP Growth	-0.03*		
Standard Errors	(0.01)		
Aid*GDP Growth	0.01*		
Standard Errors	(0.01)		
Mineral Rents		-0.45*	
Standard Errors		(0.23)	
Aid*Mineral Rents		0.07	
Standard Errors		(0.09)	
Rebel Support		-0.17	
Standard Errors		(0.21)	
Aid*Rebel Support		-0.02	
Standard Errors		(0.08)	
Gov. Support		-0.74**	
Standard Errors		(0.25)	
Aid*Gov. Support		0.23*	
Standard Errors		(0.25)	
Mountains			0.01
Standard Errors			(0.01)
Aid*Mountains			-0.01
Standard Errors			(0.01)
Forests			-0.03
Standard Errors			(0.01)
Aid*Forests			0.01
Standard Errors			(0.01)
Observations	1109	958	954
Aid + Interaction	-0.08	-0.20†	-0.07
Aid + Interaction		-0.31**	-0.07
Aid + Interaction		-0.05	

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%, All regressions are run with a standard model that contains the basic control variables, as well as the additional variables of interest and the aid interaction term. The combined affect of humanitarian aid and the interaction term is reported below the main results. The order of these sums is based on the order of the interaction terms in the models.

Table 16: IV Probit with Interactions

Variable	**(4)**	**(5)**	**(6)**	**(7)**
Humanitarian Aid	-0.38**	1.42†	-0.02	-0.34*
Standard Errors	(0.04)	(0.78)	0.09	0.04
Ethnic Frac.	-1.09**			
Standard Errors	(0.42)			
Aid*Ethnic Frac.	0.57**			
Standard Errors	(.12)			
Ethnic Conflict	-0.032 **			
Standard Errors	(0.23)			
Aid*Ethnic Conflict	0.04**			
Standard Errors	(0.08)			
Gini Coeff.		0.09		
Standard Errors		(0.06)		
Aid*Gini Coeff.		-0.03*		
Standard Errors		(0.01)		
Schooling		0.01		
Standard Errors		(0.12)		
Aid*Schooling		-0.11		
Standard Errors		(0.10)		
Oil Rents			0.03	
Standard Errors			(0.031)	
Aid*Oil Rents			-0.01	
Standard Errors			(0.01)	
Commodities			0.17†	
Standard Errors			(0.11)	
Aid*Commodities			-0.01	
Standard Errors			(0.01)	
Rebels Weaker				-0.97**
Standard Errors				(0.26)
Aid*Rebels Weaker				0.32†
Standard Errors				(0.18)
Observations	1122	189	847	1122
Aid + Interaction	0.18†	1.39†	-0.04	-0.02
Aid + Interaction	-0.11	.53	-0.03	

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%, All regressions are run with a standard model that contains the basic control variables, as well as the additional variables of interest and the aid interaction term. The combined affect of humanitarian aid and the interaction term is reported below the main results. The order of these sums is based on the order of the interaction terms in the models.

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