INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

ProQuest Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

UMI
NOTE TO USERS

This reproduction is the best copy available.

UMI
RICE UNIVERSITY

Intervention, Capabilities, Costs, and the Outcome of Civil Wars

by

Jeffrey Scott Dixon

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

Doctor of Philosophy

APPROVED. THESIS COMMITTEE:

Richard J. Stoll, Professor, Chair
Political Science

T. Clifton Morgan, Professor
Political Science

Randolph T. Stevenson, Assistant Professor
Political Science

Ira Gruber, Professor
History

HOUSTON, TEXAS

APRIL, 2001
APRIL, 2001

ABSTRACT

Intervention, Capabilities, Costs, and the Outcome of Civil Wars

by

Jeffrey Scott Dixon

A game-theoretic model of civil war termination is constructed that incorporates processes of bargaining and coercion. Key features of the model are the asymmetric nature of bargaining between the government and rebels, the presence of a post-agreement security dilemma representing the implementation phase of the agreement, and a model of how the military situation is expected to change over time.

This model generates hypotheses, which are tested using newly collected data on all civil wars fought and terminated between 1816 and 1997. As the relative capabilities of the government increase, its probability of victory increases, and the probability of a rebel win or a compromise settlement decreases. Military intervention is found to exert a substantial positive effect on the likelihood of compromise, which persists even after controlling for the purely military contributions of the intervenors. In addition, the analysis suggests that although military intervention promotes compromise, it also reduces the probability of a quick end to the fighting.
Acknowledgements

Without the continuing love and support of my wife, Katharine Diion, neither my graduate education nor this project would have been completed. I owe her my deepest gratitude.

Gratitude is also due my advisor and committee chair, Ric Stoll, for his extraordinarily useful suggestions and comments over the years. His insight and experience helped me transform a vague interest in rational explanations for civil war termination into this project, and was especially invaluable during the research design and years of data collection. His encouragement and interest were nearly as important.

I also thank Cliff Morgan for his assistance, particularly his suggestions and criticisms of the model as it developed. He steered me clear of any number of blind alleys in the modeling process. I also appreciate the support and interest of Randy Stevenson, who continually made suggestions for improving both the model and the statistical analysis. and of Ira Gruber, who helped me overcome obstacles in the historical research process. Finally, I wish to thank Meredith Sarkees, for helping me understand the Correlates of War civil war data and how it was collected. I appreciate her willingness to share preliminary data and drafts, which were invaluable during my data collection efforts.

Of course, responsibility for remaining errors or omissions in my analysis, model, or data rests with me.
Table of Contents

Chapter One – Why Do Civil Wars End? 1

Chapter Two – A Theory of Civil War Termination 100

Chapter Three – Implications and Hypotheses 142

Chapter Four – Measurement and Research Design 195

Chapter Five – Statistics of Peace: Hypothesis-Testing 290

Chapter Six – Integration and Cumulation 368

Works Cited 382
Chapter 1

HOW DO CIVIL WARS END?

"From hence, let fierce contending nations know
What dire effects from civil discord flow."

Joseph Addison. Cato. Act IV Scene V. 1713

Though Addison's protagonist uttered these words against the backdrop of ancient Rome, civil war has long been known as a uniquely brutal form of conflict. A number of scholars have systematically compared civil war to other types of armed conflict, with the results bearing out Addison's warning. Researchers have consistently found that when compared to interstate wars, civil wars last almost twice as long (Walter 1999, 1), are less likely to be resolved through negotiation (e.g. Stedman 1996, 343: Pillar 1983, 25), and all too frequently result in genocide and/or war recurrence (Licklider 1995).

The problem seems to be worsening. Since 1945, more than 90 armed conflicts have erupted within states. In at least one recent year, every major armed conflict in the world was an internal war (King 1997, 16).¹ There have been many more civil wars since 1945 than interstate wars. Recent civil wars have placed the lives of up to 42 million people at risk (King 1997, 16-17). In Africa alone, internal wars since 1980 have cost the lives of an estimated 3.8 million to 6.8 million people. 90% of them civilians (Nkundabagenzi

¹ See Licklider (1993, 5-6) for a summary of scholars using different measures that have all arrived at this conclusion.
In short, civil wars are immensely destructive events that appear to be increasing in frequency.

Given the staggering scale of the problem of civil war, the question of how one might solve the problem is paramount. In general, scholars have taken two approaches to the study of war. Using the metaphor of disease, these approaches might be classified as prevention and treatment. Prevention in the context of war means understanding the causes of war and removing or inhibiting them before war occurs. Treatment means understanding the causes of war progression or termination and manipulating them to bring the war to an end.

Adlai Stevenson once remarked, "The time to stop a revolution is at the beginning, not the end" (Thomsett and Thomsett 1997, 124). Certainly most political scientists have focused on war prevention rather than war termination. This is largely understandable – as Cashman (1993) notes, "if we can understand the causes of war, we should be able to prevent their occurrence." Carroll (1970) suggests that many political scientists view war as a failure of their efforts to prevent conflict and thus not properly in the field of politics. Goodman and Bogart (1992) note that a bibliographic compilations of studies in negotiation lists only 12 references to war termination out of 5500 citations total; they also find few graduate programs that offer coursework on the termination (as opposed to causes) of war. Vasquez (1997) notes that war termination falls between the more accepted realist and peace studies research programs.

Although research on the causes of war has produced some important findings (Vasquez 2000), it has not yet produced the theoretical equivalent of a vaccine for war.
Given the continued existence of war, it would be shortsighted to overlook the notion of treatment. Even if prevention of war should prove impossible, perhaps its resolution may be hastened or its deadliness be mitigated. The initial victims of an outbreak of war deserve our consideration – but so do the victims of an unnecessary continuation of war.

Certainly, political leaders have expectations about the progress and termination of civil wars. These expectations are sometimes incorrect. Abraham Lincoln said of the American Civil War:

"Neither party expected for the war, the magnitude, or the duration, which it has already attained. Neither anticipated that the cause of the conflict might cease with, or even before, the conflict itself should cease. Each looked for an easier triumph, and a result less fundamental and astounding. Both read the same Bible, and pray to the same God; and each invokes His aid against the other.... The prayers of both could not be answered; that of neither has been answered fully." \(^2\)

If political leaders' expectations about the results of war are at least partly responsible for whether they decide to fight, then it is imperative that progress be made on accurately predicting war results. Here the disease metaphor falters: people generally don't willfully choose illness, nor have they the power to cure themselves whenever they please. Leaders, on the other hand, do have the ability to choose peace instead of war, so understanding its likely outcome is not only important for treatment, but also constitutes a form of prevention.

Given the problem of civil war and the importance of understanding war termination, the fundamental normative question at the heart of such analysis should be: What can be

\(^2\) Abraham Lincoln, Second Inaugural Address. March 4. 1865
done to alter the outcome of civil wars?\footnote{Bloomfield appears to represent the opinions of most scholars of conflict termination when he says. "A compelling reason to keep working at conflict research is to try to} Answering this question requires a model of how civil wars progress and terminate. When the factors that determine the duration and resolution of civil wars are modeled, it will then be possible to ask how manipulable those factors are, and how such manipulation may alter the characteristics of the conflict. Thus modeling civil war termination should precede analysis of external intervention. The research question is therefore: *What determines the outcomes of civil wars?*

It should be clear from this discussion that I will develop a model of the outcomes of civil wars, use this model to derive implications about what affects those outcomes, and examine the accuracy of these propositions as well as what their implications for would-be intervenors. Before a model of civil war outcomes can be constructed, three general questions must be addressed:

1. What does research on war termination have to tell us about the outcome of wars?
2. Are general models of war termination sufficient to explain civil wars, or is a model particular to civil conflict required?
3. Are there distinctions among civil wars that are so fundamental as to require different models for different types of civil war?

Because civil wars are so often misrepresented and because the subject is not as familiar to many conflict theorists as interstate war. I take considerable time to address a large number of potential influences on the resolution of civil wars. While most of these are in the end discarded, much is learned in the process of evaluation. The remainder of
this chapter will address each of these questions in turn, laying the groundwork for a
theory of civil war termination (Chapter 2), the derivation of testable hypotheses (Chapter
3), the construction of an appropriate dataset for examining them (Chapter 4), hypothesis-
testing (Chapter 5), and an evaluation of puzzles and cumulative knowledge in the study
of civil war termination (Chapter 6).

1.1 GENERAL THEORIES OF WAR TERMINATION

In order to answer Question 1, it is necessary to examine both the state of knowledge
regarding war termination and whether civil wars stand apart from this domain of
knowledge. I turn first to thoughts about war termination and only then consider the
nature of civil wars and how it may differ from other types of conflict.

There are three schools of thought regarding war termination, all of which developed
around the termination of major interstate wars. The first holds that wars end when their
root causes are resolved. The second states that wars end because the dynamic process of
war reaches equilibrium, possibly through the destruction of one side. The third school
of thought argues that wars end because the warring parties find some agreement they
prefer to war. For convenience, I label these three lines of inquiry the root causes
approach, the war process approach, and the bargaining approach.

_"change the proportion of wars that proceed as far as to military victory as compared to
1.1.1 ROOT CAUSES

The root causes approach holds that removal of the conditions that caused a war is necessary or sufficient to end the war once it is underway. Analysis that uses the root causes approach can therefore be divided by what underlying cause is held to be responsible for war's onset and continuation. One can either look at the more immediate causes such as balances of power or underlying causes such as the existence of war as a legitimate policy choice.

The most significant work among the first group is probably Blainey’s (1988) study of the causes of war, which argues.

"The same framework and the same set of causes should be employed to explain each dramatic turning point in relations between nations. The same set of factors should be examined in order to explain the outbreak of a war, the widening of a war by the entry of other nations, the narrowing of a war by their withdrawal, the ending of a war, the surmounting of crises during an era of peace, and the closing of that era of peace. The same causal factors, though they appear in different combinations, explain both war and peace" (242).

For Blainey, wars are essentially disagreements over the relative power of two nations — once war has revealed the rank of nations on the ladder of power, the reason for fighting disappears. Once the participants have measured relative strength in war, they see what their proper bargaining positions are and end the war. This implies that if one could magically measure power in an accurate and universally convincing way, wars would never occur: "When nations prepare to fight one another, they have contradictory expectations of the likely duration and outcome of the war. When these predictions, however, cease to contradictory, the war is almost certain to end" (1988, 294-5).
Nicholson (1967) echoes this argument, stating that if war outcomes were known in advance, they would never occur.

For Smoke and Harman (1987) the root causes of conflict are not only the immediate political issues which divide antagonists, but also ways of thinking about defense, security and the legitimacy of violence. They argue that conflict resolution and peace are matters of degree, and that the more deeply one can undermine the fundamental causes of war, the more likely it is that wars will cease. Their nine paths to peace range from the concrete – resolving particular conflicts of interest – to the highly abstract, such as belief in the possibility of sustainable peace. This particular work is purely exploratory, with little in the way of theorizing or connection to the empirical world.

The root causes approach to war termination remains a distinct minority within the academic literature, for it suffers from several theoretical and empirical difficulties. Though Blainey’s idea of uncertainty about the power of each side is intriguing, there are several reasons to believe that the termination of war once it is underway requires more than perfect information about the capabilities of the opponent. For example, it appears that many wars end long after the relative power of both sides has been established. As Sigal (1988) noted, hostilities between the United States and Japan continued for at least a year after everyone knew who would win. Such anecdotal evidence abounds.

And while Smoke and Harman may well be correct about the long-term resolution of violent conflict in general, it is not clear that resolving wars necessarily requires removing the root causes of conflict. As Miall, Ramsbotham, and Woodhouse observe.

"The relationship between conflict resolution and the ending of violent conflict is not necessarily direct. The root
causes may persist without either a war or a peace settlement doing anything to address them. More often than not, war generates additional conflicts, which add to and confuse the original issues. It is quite possible that efforts to resolve a conflict may not end a war, and efforts to end a war may not resolve the underlying conflict” (1999, 153).

Moreover, this literature has generated essentially no testable predictions about the progress and termination of future wars. One cannot use the approach developed at this point to pick an ongoing conflict and make a point prediction about when it will end.

Finally, the root causes literature suffers from two theoretical difficulties. First, it has great difficulty when faced with problems of duration. After all, the fundamental question that drives this approach is “Why?” not “When?” But we do know that some wars last longer than others, and presumably political change can occur during that period. If this is so, then perhaps goals of the participants, or even the identity of the participants, can change as well. A war after three years of fighting may be quite different than a war after three days of fighting, and the differences may create a different set of causes for war continuation than those that led to its initiation. In short, the root causes approach may become less applicable as the duration of a war increases.

Second, this literature has had little to say about the strategic interaction of war participants after the war begins. War is held to be a neutral metric of power or arbiter of grievances, and the participants are given little opportunity to bargain over the terms of settlement. It is generally assumed either that the terms of settlement are determined by the starting conditions (and that therefore war would never occur absent misperception)
or that the parties to the war need only find the heretofore hidden mutually beneficial agreement to bring about its closure.

Perhaps the lessons to be drawn from the root causes approach are that disagreement about the outcome of war makes the war more difficult to resolve and that explanations of how wars end ought to be consistent with explanations of their onset. Two bodies of literature have attempted to retain these lessons while addressing one of the theoretical problems associated with the root causes approach. The war process approach focuses on how wars progress once underway while the bargaining approach focuses attention on the ability of the sides to bargain during war. Since it is probable that wars not only have an underlying dispute but also processes of coercion and negotiation, it is important to examine each of these schools of thought.

1.1.2 WAR PROCESS

The war process literature can be seen as partly a reaction to Clausewitz’s notion of war as “an act of violence intended to compel our opponent to fulfill our will” (1968, 101) and his accompanying division of means (a series of duels between warring parties) and ends (the political object which one side wants the other to accept). It tends to focus on two motifs: dynamic models of combat and attrition (means) and how the war process changes the original goals of the combatants (ends). Though Clausewitz is seldom mentioned by those addressing means, he is usually explicitly acknowledged by those addressing ends. I therefore first examine work on how war changes the goals of combatants and only then proceed to models of combat itself.
Wartime Changes in Goals

Those researching ends are generally reacting to the Clausewitzian tradition of presuming the existence of a definite political objective, to which is connected the levels of violence employed and the costs required to compel the opponent to cede the goal. If Clausewitz is taken descriptively rather than prescriptively, nations or leaders are thought to have a concrete political purpose for fighting set before the war -- for example, acquisition of a piece of territory or removal of an opposing leader. War turns one side into victors and the other into vanquished. Achievement of the goal the initiator is seeking will thus end the war.

A number of scholars distinguish between wars on the basis of their objectives and detail the process through which those objectives change over time. Of particular interest has been how limited goals become absolute ones. Hobbs (1979) argues that total war is distinguished from ordinary, limited war not by the forces employed but by the nature of the objective. If objectives come to be defined as "our way of life" rather than a specific set of political demands, nothing short of absolute victory will suffice. Hobbs criticizes the demand for unconditional surrender in World War II, arguing that it prolonged the war unnecessarily. He reserves his sharpest criticism, however, for what he views as vacillation in American war aims when fighting communists, and points to the lack of war objectives between the enemy’s surrender or stalemate as its cause. He therefore criticizes deviation from the Clausewitzian notion of war, pointing out that Clausewitz allowed for a range of political objectives between simple defense and destruction of the
enemy. Similarly, Morrow (1985a) argues that analysts should expand their thinking beyond absolute wars to recognize that most if not all wars have a variety of outcomes that fall between absolute victory and absolute defeat.

It is common in this literature to recognize that one's objectives in war may not be transparent to the enemy. Hobbs warns of the danger of misperceiving an enemy's war aims as total when they are in fact limited; Caven (1980, 292) argues that ancient Carthage suffered total destruction because it misperceived Roman aims as limited when they were in fact total.

No doubt the stridently anticommunist worldview of Hobbs colored his analysis of specific policies, but he is certainly not alone in warning of the dangers posed by intrawar mutation of political objectives. Perhaps the most influential rebuttal to the simplistic notion of war as simply a method of seizing preset goals is Inkle's (1991) work, which divides war into "rational" and "nonrational" components.\(^4\) He begins by noting that governments typically enter wars without clear plans for ending them.\(^5\) As the military balance changes, so do their objectives, because they weigh any proposed settlement against the proposed gains/losses from continued war. This is the rational component of war. It is complex; for example, territorial gains may make future conflict more likely and thus require the complete destruction of the opponent's forces to avoid future wars.

\(^4\) It is the overwhelming tendency of war termination scholarship to use rationality in a loose vernacular sense, as procedural rationality, instrumental rationality, and a generalized sense of cost-benefit analysis. I treat the term in this sense when discussing the relevant literature and scholars' arguments, but clarify its precise meaning within my theory in Chapter 2.

\(^5\) Cimbal (1990) examined American and Soviet plans for war and found that none of them included the termination of the war.
Moreover, the progress of war alters the relative attractiveness of a given political settlement. The goals of a war may change during the war even if everyone is rational, because war opens up new possibilities by allowing sides to attempt forcible seizure of territory or destruction of the opponent's army.

Ilklé's "nonrational" component of war stems from this process, where "means become ends" in and of themselves. The military may gain so much political power that its own interests take precedence over the state's interests and the state ceases to function as a unitary rational actor. Ilklé notes that within this framework, several factors frequently affect the duration and outcome of wars. First, echoing Blainey, uncertainty about capabilities of the opponent and of an opposing coalition may prolong a war. Other types of misperception also exist, however: nations routinely overestimate their own cost tolerance and underestimate their rival's ability to tolerate punishment. Second, the choice may not be a simple "fight or negotiate" set but rather may include the option of escalating the war militarily or politically. Thus, the probability of victory in war is not some fixed quantity, but changes with the strategy a nation considers. Indeed, the very meaning of victory changes as the war develops. Thus, even in situations where peace seems better than a continuation of fighting, a nation may choose escalation in the form of a new ally or a new front. This work marks an advance beyond the assumption that wars do not raise new obstacles to their own termination and therefore begin and end for the same reasons.

Sigal (1988) uses modified versions of Allison's (1969) models of decision-making to examine the end of the war between Japan and the United States. He argues that the war
continued long after its outcome had become apparent. Sigal offers qualitative evidence in support of his arguments that factional divisions within both nations contributed to a prolonged war. In turn, these factions were partly created by war, and even those factions that preceded war were altered by its mere existence. For example, military leaders on both sides gained influence from the existence of the war. The conflict thus generated some of the conditions that led to its own longevity. Halperin (1970) noted that different factions within armies gain or lose influence as a war progresses, and that this raises obstacles to successfully ending a war. Finally, Bracken (1992) also notes that wars can prompt institutional changes in the military and government that can impede war termination.

This work contributes to knowledge of how and why goals can change during wartime. There are some conclusions common to these theorists:

- Policy goals determine the nature of war
- There are goals that lie between absolute victory and absolute defeat
- Emphasis on absolute victory leads to total war
- Which goal guides the course of the war can change during wartime

However, there is considerable disagreement between these theorists about why some goals are adopted over others. Clausewitz noted that the more one demanded of one’s opponent, the greater would be the amount of force needed to compel the opponent to submit to that demand. Similarly, the greater one’s demand, the harder it would be for an opponent to dissuade one from pursuing it (109). If this is correct, it would seem to imply that as one’s opponent becomes stronger or more capable of inflicting pain, one
will be willing to give in to ever-larger demands (and be prepared to abandon ever-larger demands of one's own). This certainly seems consistent with Ikle's rational elements of changing objectives in response to changing military developments.

Phrased in this way, it is not clear how much value is added by discussion of goals: it sounds like one asks for whatever one can get. This is a useful indictment of theories of war termination that assume a fixed goal to fighting, though it is not particularly damaging for theories of war initiation (since presumably a state could indeed have a set goal when entering a conflict and only later modify that goal in response to unexpected developments). The implication is that while ends, particularly unlimited ends, do influence means in the form of commitment to war, the means themselves also affect what ends are considered worthwhile.

Sigal's analysis suggests a different set of reasons for changing goals, related to organizational structure or bureaucratic infighting. Both this analysis and Ikle's nonrational elements of war termination emphasize the internal divisions within war participants and how war alters the relative weight internal factions carry in final policy choices. However, if war success contributes to increased influence of military organizations and military failure contributes to decreased influence of these institutional actors, the observed result of the decision-making process may be indistinguishable from a process in which goals or demands increase or decrease in response to the military balance. One would expect to observe different results only when additional factors affect the influence of organizations on the decision-making process or when the punishment inflicted by an opponent affects different factions differently.
Wartime Changes in the Military Situation

Inextricably tied to these models of goal change is the notion of a dynamic process of war, in which the military situation changes over time. It is to these models of the means by which ends are pursued that I now turn. A number of researchers have argued that the thing that ends a war is changes in the military balance over the course of the war. These models might usefully be divided into "threshold" and "feedback" types. The first of these looks for a threshold beyond which continued fighting became impossible while the second assumes that if such a threshold exists it is determined by the interaction of power, resources, and battlefield developments.

As for the threshold models, one can think of them as mirrors held up to the goals analysts – instead of finding the goals that will justify continued fighting, they seek to identify the limits beyond which continued fighting is impossible. The dynamic component of these models is typically the process of combat itself, not the critical threshold. A threshold is assumed to be fixed for a given combatant and when crossed, that combatant must sue for peace.

One of the first quantitative analysts of conflict, Richardson (1960) hypothesized that defeat in bilateral wars of attrition occurs when one side suffers deaths equal to some critical proportion of its population between .0005 and .05. Another early quantitative study that used this approach to the termination of war was that of Klingberg (1969), who

---

6 That this was not intended to be an ironclad rule is indicated by his estimates that Serbia suffered up to 22% of its population killed before being overrun in 1918 while Paraguay suffered up to 83% fatalities by 1870 (299).
attempted to predict war termination from casualty levels. He found that for conflicts over minor issues, there was no set loss that brought about war termination, but for major or unlimited objectives, a loss of 4-6% of a nation's population caused the nation to terminate the war. Since the number of wars fought over unlimited objectives was so low, his conclusions are relatively weak. Rosen's (1972) investigation found that only two wars involved casualties above 5% of a state’s population, lending some support to Klingberg and Richardson, but the number of cases was still small and exceptions existed.

Nevertheless, Organski and Kugler (1978) picked up the idea of a 5% threshold for war termination, arguing that the side with superior resource extraction will be able to force its enemy to that threshold first. Voevodsky's (1969) analysis of casualty rates argued that there were "limits in strength build-ups and casualties a nation will sustain, beyond which it either accepts defeat, changes its leadership, or acquires new allies." though these limits were different for different nations at different times (278). Kadera's (1998) model of war expansion also assumes the existence of thresholds beyond which a state must drop out of war. Echoes of this type of analysis can also be found in the literature on strategic war termination during the Cold War. Robert McNamara once argued that killing half of the people in the USSR was sufficient to deter an attack, regardless of other incentives (Martel 1986, 26).

The search for fixed critical thresholds has not yielded the sort of iron laws of war that those who researched it hoped to find. As Stam (1996) notes.

"...finding or predicting the point at which a state makes the necessary plaintive cry is exceedingly difficult. In
almost all wars, further resistance is possible until the last person is dead. It is not necessary, typically, with perhaps the exception of the nineteenth-century war in Paraguay, to kill all the men in a country to defeat it in a war” (19).

Stam’s allusion to the Paraguayan War is apropos. for no fewer than 50% of that country’s population died in the war (the majority by starvation or disease) before its last army was destroyed and its leader killed in battle: a similar proportion of Haitians died during its 1791-1803 struggle for independence (Clodfelter 1991). Though these cases are extremes, they do demonstrate that resistance may continue in spite of very great losses.

If there is no fixed and general threshold beyond which an enemy will surrender, then perhaps there are other sorts of thresholds that change along with changes on the battlefield. Feedback models generally also have critical thresholds, but these thresholds are the product of interacting processes. One’s own threshold for surrender may depend on what one believes about the possibility of turning the war around, or about the cost-tolerance of one’s opponent. I first examine studies that attempt to model such thresholds as variables predicting war-winning and then proceed to the more complex dynamic models of warfighting.

At the most basic level, studies of power, combat effectiveness, and war-winning have examined whether war itself generates a threshold for each side that varies over time. For example, Cannizzo (1980) uses the relative loss rates, combined with the relative strength of the sides, to predict the outcome and characteristics of interstate wars. For Cannizzo, wars end because one side starts losing forces much more rapidly than its opponent. Eventually, the drain becomes so great that either both sides are exhausted in a war of
attrition or one side is defeated in a rout. Rosen (1972) posits that two thresholds are relevant: a military one defined by a critical ratio of capabilities, and a political one defined by a tolerance for casualties. Rosen represents capabilities in terms of central government revenues and cost-tolerance by deaths suffered. He finds that while capabilities seem to predict winner and loser well, the cost-tolerance of each side does not seem to add much predictive power. Wayman, Singer, and Goertz (1983) found additional support for capabilities as a determinant of war-winning, and also discovered that their measure of a state's industrial capacity was a better predictor of who would win than measures of military capabilities.

A recent work that takes this approach is that of Stam (1996), which attempts to predict whether a state wins, loses, or draws in a war. For Stam, the initiation of war is fundamentally about some issue, which then affects the outcome of the conflict by altering the strategies of each participant. However, Stam's model presents issue as some static thing that is set before the war, not something that changes during the war. Thus, there is no bargaining in Stam's model. nor is there even some outstanding offer other than (perhaps) the status quo that a nation is using to assess the value of continuing to fight. Instead, Stam argues that the outcome of war is determined by a list of characteristics of the conflict, sides, and the sides' intrawar behavior. He finds that in general, increasing the ability to impose costs on the opponent or deny the opponent benefits increases one's likelihood of winning. Reiter and Stam (1998) find that democracies are more likely to win battles, and therefore wars: Bennett and Stam (1998) find the democrat's advantage in war declines as the war's duration increases.
Others model warfighting as a dynamic process. The genesis of these models lies in the numerous efforts by analysts over time to determine the results of combat. The usual foundation for these models is a system of rules and equations provided by Lanchester (1958). These equations focus on predicting casualties from fighting, and have been extremely influential in military thought. As Epstein observed, "The Lanchester equations have for decades dominated the dynamic assessment of conventional land balances" (1987, 9). These equations and the plethora of studies that have followed them (see Stoll 1993 for a brief summary) cannot predict the end of a war by themselves for they cannot specify the point, short of annihilation, at which an opponent will quit. For example. McGuire (1985) develops a model based on Lanchester's equations to predict battlefield losses but does not take the next step to predicting the end of war by establishing a threshold or some other method to determine when the war stops.

Similarly Allan and Stahel (1983) and Stahel (1985) predict casualties over time for the Soviet-Afghani struggle but their model assumes that wars go on forever - a settlement during the period of analysis renders the model's predictions absurd.

Moreover, dynamic models have had a mixed record at best when it comes to predicting costs and outcomes of war. Bellany (1999) is a recent attempt to model war termination with a Lanchester-type model of combat. Using some of the results of Voevodsky (1969) as a basis for his assumptions, he models war as a process of mutual mobilization that would lead to steady-state outcomes but for attempts to disrupt mobilization, damage infrastructure, or otherwise prevent an opponent from mobilization. Unfortunately this work makes few testable predictions, relying on descriptive analysis of
several historical cases. Smith (1998) also models war as a dynamic process, though he substitutes a process of territorial expansion through the capture of "forts" for a Lanchester-type system of equations. Again, however, the resulting implications are so abstract as to be virtually untestable. Despite this common weakness, these approaches are important because they provide the foundation for a process model of war allowing for intra-war changes in costs, capabilities, or other relevant aspects of the war.

In sum, while root causes researchers stress consistency between theories of outcome and theories of initiation, particularly in the realm of power relationships, war process researchers build on these concepts by focusing attention on the changes produced by war. Warfare changes political goals because it changes the probability of successfully achieving a given goal. It also changes goals through the effects it has upon the institutional structure of the combatants, especially regarding the role of the armed forces. Moreover, war creates costs for the participants that should make the participants more likely to capitulate, and alters the capabilities of participants, which in turn affect their expectations about the likelihood of victory. To return to Clausewitzian terms, the political ends of war change in response to the means used and the outcome of combat. The means used are themselves dependent on the nature of the political ends for which the war is fought and the vicissitudes of combat.

This picture is incomplete in several ways. First, while considerable success has been achieved when predicting who will win a war from prewar resources, little work on other types of war outcome has been done. In particular, since most wars end short of absolute destruction for one side, there must be a process that stops the war before then. Even if
one accepts the notion of a fixed threshold of casualties, this threshold is seldom approached in war (Richardson 1960; Rosen 1972; Coser 1961). What war process models neglect is the bargaining component of war. If wartime goals can change in response to the process of war, then bargaining between the sides may be possible, as each participant seeks to moderate the demands of its opponent and advance its own demands.

Not only is there no strategic interaction between the sides in these models, they are not even decision-theoretic approaches. They focus on structure and process: wars function as more or less natural systems which can be analyzed and predicted by establishing relationships between variables. This is obviously a problem if one believes that a state may alter its military strategy in response to that of its opponent, or that a state may make its opponent offers to end the war short of its total defeat. It also raises logical problems. For example, Maoz (1990) demonstrates that even if it is the case that there is some threshold beyond which fighting will no longer be "worth it," the war can nevertheless proceed far beyond that point, as in World War I. The reason is that if we think the sides are making choices, then they should be basing those choices on prospective gains and losses. Marginal gains and losses ought to matter, and if they do then participants may seek to change their strategies during the war to increase their opponent's loss rate and decrease their own.

In short, war is not simply a mechanistic process of coercion, but also a political process in which actors make choices about what to demand or concede based on interaction with their rivals. In many ways, this division in the war-termination literature
resembles Carroll's (1970) distinction between studies that use "fightlike" or deterministic approaches and those that take "gamelike" or strategic approaches that allow for de-escalation and bargaining. It is to the latter that I now turn.

1.1.3 BARGAINING

That bargaining occurs during war is largely uncontroversial. In some cases, direct negotiations are held. In others, bargaining may be accomplished through signals of one's intentions. Even the most lopsided outcomes may in fact be bargains of a sort, since war termination is usually the result of mutual political choice rather than complete destruction. For example, Kecskemeti (1958) found that even the unconditional surrenders of the vanquished in World War II were still choices between fighting and even worse outcomes. While the Axis powers certainly faced very high costs if they continued to fight, continued resistance was possible. He found that surrender was a rational alternative to continued fighting, because surrender implies that the victor does not exterminate the loser. Once the Allies made this plain, the Axis powers were able to choose the option of surrender. Strategies of disruption (destruction of all enemy forces), siege (starvation through blockade), or attrition (imposing unacceptable costs on the opponent) could all produce the strategic action of surrender at different points, making the conflict process itself an important cause of war termination, even if initial issues were fixed. While the study hints that uncertainty about its outcome begins wars and ends them, Kecskemeti does not dwell on this insight and focuses on the resolution of the conflict through changes in the strategies of each side during the war. Sigal concurs.
arguing that there were critical concessions made by the United States in return for the Japanese surrender.

Elements of Iklé's model are also relevant to bargaining, particularly a number of his "nonrational" elements of war termination. For Iklé, there are two levels of intrawar bargaining. First, the debate within each nation between "hawks" and "doves" is critical to war termination. The factions within a nation may not agree on the aims of the war, the probability of victory, or the cost tolerance of their own nation and their opponent. Second, bargaining between the combatants is necessary for war termination, yet negotiating while fighting is different than negotiating before a war. This is because making an offer is difficult in the absence of diplomatic ties, and the first side to make a public offer may undermine their own chances for victory. Talking to the opponent also exacerbates tensions within the country between factions, since every proposal must go through a second stage of bargaining within a nation. These are nonrational factors in a vernacular sense only: there is no particular reason that two-level bargaining or signals of weakness cannot be incorporated into a rational model of war termination.

Others have pointed out supposed "nonrational" components of intrawar bargaining. For example, Stigal is critical of the rational actor model of war termination. He argues that it fails to resolve the questions of why hostilities continued long after everyone knew who would win and why the United States didn't make its watered-down offer of unconditional surrender (which implied retention of the Emperor) earlier. Stigal considers it irrational to fight after marginal costs of fighting exceed the marginal benefits. Obviously, this is a paradox only if fighting and simply ceasing to fight are the
only options and by cessation of fighting, one reduces one's marginal costs to something below the level of marginal benefits. After all, if surrender means massacre, halting resistance may mean substituting a situation in which marginal costs exceed marginal benefits for one in which marginal costs are even higher and marginal benefits are nonexistent.

While these works are very general studies of war termination, a number of scholars address bargaining and war termination by examining one phase of the wartime bargaining process. I will address these works in order of the phase which they describe: interest in agreement, the steps in the bargaining process, and post-agreement behavior and enforcement. Some authors deal with several of these phases at once; nevertheless, this is a useful system for organizing their findings.

*Interest in Agreement*

Perhaps the seminal rational choice model of war termination was put forward by Wittman (1979), which presents a decision-theoretic expected-utility model of war termination. Because of the importance of this model in the rational choice literature on war termination, a brief summary of the model is appropriate.

The model attempts to capture the necessary conditions for the settlement of wars in a form that is consistent with rational-choice ideas about how wars begin. The dependent variable is whether a war continues or a settlement is reached. For Wittman, these are the only two alternatives, for he argues that all wars end by agreement: following Kecskemeti, even unconditional surrender is an agreement, chosen because it is preferred
to complete annihilation. Each side has a subjective probability of victory and a subjective probability of defeat. These probabilities are multiplied by the utility of winning and losing, respectively. Adding these two terms gives the expected utility of continuing to fight. Settlements are located on a continuum between unconditional surrender by a side and unconditional surrender by its opponent. It is the comparison of the expected utility for continued war and the utility of a proposed settlement that determines whether the possibility of negotiation exists.

The implications of this formal model are similar to many arguments made by Iklé and other qualitative researchers. First, since probability is subjective, there can be a situation where both sides believe they will win. Negotiated settlement is unlikely in this case. It is also possible that both think they will lose: this facilitates agreement. As one side’s power goes up, the other side becomes more interested in peace -- but the rising power becomes less willing to compromise. Thus power alone has no relationship to whether a war ends. To the extent that information is increasingly accurate in war (as Blainey suggested), agreement on the probability of victory does not lead to negotiated settlement, because it ensures that an increase in the smaller side’s desire for peace is exactly countered by increased interest in war by the stronger state. Moreover, reducing the intensity of war should prolong it, for it is a “hurting stalemate” that brings both sides to the bargaining table, as the costs of war are expected to increase even though the probability of victory is expected to remain the same. The use of subjective probabilities in an expected-utility framework thus allowed Wittman to incorporate many elements previously termed "non-rational."
A rather large proportion of subsequent work on war termination has addressed Wittman's claims. Some objections to Wittman are relatively easy to dismiss. For example, Mitchell (1991) objects to the expected utility approach to war termination, arguing that it is probably not the case that decision-makers wake up each day thinking about whether they want to end or continue the war that day. He also criticizes the unitary actor assumption employed by Wittman, a criticism reinforced by earlier analysis of negotiation in the Boer War (Mitchell and Nicholson 1983). Morrow (1985a) criticizes Wittman for his binary war outcomes – victory or defeat. As noted, Morrow advocates the use of a continuum of war outcomes between absolute victory and defeat. Finally, Aggestom and Jönsson (1997) argue that rational choice explanations for war termination ignore the potent effects of framing and loss aversion on decision-makers.

These objections largely miss the mark. The idea that both sides are constantly re-evaluating the utility of continued war is not necessary for Wittman's conclusions: one need only assume that for whatever reason, an offer is on the table. The model itself is neutral with respect to when or how often this situation occurs. Similarly, while Wittman assumes unitary actors for simplicity, it would seem that bargaining within coalitions on each side represents an addition to rather than a rejection of his approach. True, such bargaining is not a part of the model, but neither is it inconsistent with the expected utility approach. Moreover, Wittman does not fall into the trap of assuming that victory and defeat are absolutes – he defines victory as simply an outcome to war that is preferred to -defeat. Aggestom and Jönsson's criticism is indeed relevant to the decision-theoretic model of Wittman, though it should be noted that incorporating the insights of
prospect theory onto a model of war termination requires a number of additional assumptions or extremely difficult measurements to establish a decision-maker's reference point and the framing of a proposed bargain - assumptions that carry a cost in terms of simplicity and generality.⁷

A more substantial critique of Wittman's approach is offered by Morrow (1985b), who criticizes Wittman for generating an interesting but trivial model. He notes that Wittman compares only the utility of settlement now with the utility of fighting now. Morrow argues that predictions about the termination of war must incorporate a comparison between the situation one faces now and the situation one expects to face later:

"In some sense, this approach is a logical cul-de-sac: we can deduce interesting, testable propositions, but we cannot test these propositions without facing the same question of what costs and benefits each actor will receive over time" (117).

While Wittman believes that wars end because the expected utility of fighting becomes lower than the expected utility of settling, Morrow argues that one may continue to fight in the hopes of achieving an even better settlement later. While this does not directly contradict Wittman's approach, it suggests that it is seriously incomplete.

Wagner (2000) presents a formal model intended to evaluate a number of Wittman's conclusions. As Wittman's model did not attempt to predict which particular agreement might end a war, addressing only the question of whether such an agreement existed.

⁷ Mintz and Geva (1998) outline a model war termination founded in prospect theory. They find experimental support for some of its insights, but do not apply it to actual wars
Wagner incorporates a model of intrawar bargaining into his model. He also argues that many wars are not actually Clausewitzian affairs in which one side attempts to disarm the other. Because Wagner's model is a significant advance in the rational choice analysis of war termination, I briefly outline his model before evaluating his contribution to understanding war termination.

Wagner begins by establishing that bargaining does not end when a war begins. Drawing on Clausewitz's distinction between absolute war (in which each side seeks victory through disarming the opponent) and real war (in which an end short of abject subjugation is sought), he argues that most wars fall under the latter category. Wagner's model argues that war first takes the form of real war, which reveals to each side information about the military situation and about its opponent. After some period of real war occurs, each side may decide to make an acceptable offer to its opponent or refuse to do so and enter an absolute war. This model helps to explain why wars occur at all, since the initial period of real war is necessary to provide each player with the information they need to bargain - that is, each side's military capabilities and ability to impose costs.

Because expectations about the costs and outcome of absolute war guide the choices each side makes during real war. Wagner begins by modeling absolute war. He views absolute war as a potentially infinite series of periods of fighting; during each period there is some chance the war continues and some chance that one side succeeds in disarming the other. Since a side suffers costs during every period of fighting, the total cost of an absolute war will be a function of how likely it is to end each period.

because of the difficulty of controlling framing effects, etc.
Obviously, if one side disarms its rival it wins the absolute war. Stalemate is simply a war that continues past some arbitrary number of periods – while Wagner’s formal model allows war to go on literally forever, he concedes that in fact an absolute war would almost certainly end by some point.

Having constructed a simple model of absolute war and its expected costs, Wagner turns to negotiation. He assumes that during every period in which the absolute war continues, each side can make an offer to the other.⁸ The result is a simple Rubinstein game with alternating offers and a risk of breakdown – in this case, victory by one side or the other. Using the solution to such a game offered by Osborne and Rubinstein (1990), he notes that a player can always prevent war in the first place by making an acceptable offer to its opponent. This is consistent with Wittman’s assumption that all wars end by agreement, for in Wagner’s model the players never actually find themselves in an absolute war and therefore the chance one side is actually disarmed by its rival is zero. It is the counterfactual of absolute war that matters in Wagner’s model: we would not expect to observe absolute wars in the real world but nevertheless the costs of embarking on such a path influence decision-makers.

Having established the conditions under which the parties agree in order to avoid absolute war, Wagner turns to real war. His explanation for why war occurs at all is that real war is necessary so that each side can estimate the consequences of absolute war. If

---

⁸ Interestingly, Wagner represents the possibility that each side is not unitary but instead a coalition that must negotiate a response to an offer by simply positing that making an offer takes some amount of time. He appears to realize the limitations of this representation and focuses on those cases in which the sides can be treated as unitary actors.
probabilities of victory, costs, etc are not known to the players but are instead subjective estimates, each side has an incentive to plan and fight campaigns of a type that will alter its opponent’s estimates. Of course, if both sides had identical expectations about how the course of military events in real war would alter these estimates, they would reach a bargain before fighting the real world.⁹

To explain why wars occur, Wagner turns to the notion shared by Wittman and Blainey that each side may expect military operations to have different effects. If both players expect military operations to favor them, the real war occurs and continues until this is no longer the case. Wagner expects that the sides’ subjective estimates will eventually converge through a process of Bayesian updating. His model is an advance because it recognizes not only that war can occur when there is no agreement both sides prefer to taking their chances in war, but also that even if several such agreements exist, fighting may occur if each side expects that demonstrating its own capabilities or ability to impose costs will lead to an agreement from this range that is closer to its ideal point. Therefore a state may continue to fight even if it has no chance of disarming its opponent if it believes that its opponent has underestimated its capabilities or ability to impose costs.

Finally, Wagner suggests an additional reason that wars might continue. If a war involves taking something (strategic territory, for example) that once possessed increases the possessor’s probability of prevailing in a fight to the finish, then an additional

⁹ Werner (1998) finds that uncertainty about an opponent’s discount rate can prevent agreement even when both sides have accurate information regarding capabilities and
obstacle to bargaining is created. For if the weaker (or less cost-tolerant) party wishes to simply concede this territory instead of fighting an expensive and dangerous absolute war, it must consider the possibility that, having enhanced its capabilities through possession of the strategic territory, its opponent will be in a position to demand even greater concessions. Wagner thus introduces the concept of the difficulty of enforcing agreements into his model, though his analysis focuses on the intrawar rather than postwar period.

Filson and Werner (2001) also reject the notion of war as a process whereby states “fight to the finish.” They develop a model of bargaining and war that includes the choice to initiate a war, the choice to keep fighting after one or more battles, and the choice to terminate a war, with the option of negotiating peace at each step. Each player begins their game with a pool of resources and a separate pool of benefits. Resources find the war effort while benefits are divisible stakes of negotiation. Wars are represented as alternating periods of negotiation and battle. The war ends when agreement is reached or one side runs out of resources and can therefore no longer resist. Wars occur and continue because a player misjudges the type (resolve) of its opponent or misjudges its likelihood of success in battle. While intriguing, this model offers little more traction on war termination than that of Wagner, and at the cost of a substantial costs. For Wagner, the risk of defeat in a given round of fighting acts as a discount rate would in a Rubinstein game.
increase in complexity and a number of arbitrary assumptions adopted to make the model solvable.\textsuperscript{10}

This group of models is quite useful, for the rational choice ones in particular seem to explain a wide range of behavior with relatively few assumptions and enable some testable hypotheses to be derived. Nevertheless, the heavy reliance on subjective estimates of power, odds of winning, and costs by each player makes testing most of these theories' implications a difficult proposition. None of these theories models where those initial expectations come from.

\textit{Negotiation Processes}

A second group of scholars focuses on the various steps in the negotiation process. Smith (1995) leaves aside the notion of military victory and defeat, focusing on stalemate-induced war termination. According to Smith, this is a recent phenomenon, beginning after 1945 and dramatically accelerating during the 1960s and 1970s. He states that most wars now end in this fashion. His goal is to explain why stalemates do not lead to simple cease-fires. He argues that the desire to appear strong both to the enemy and to one's own people, the near-inability of groups to lobby effectively for peace, a lack of a cohesive goal or proper control of one's forces, and the absence of straightforward communication between the sides all make it very difficult to reach a cease-fire. Thus wars end either by a straightforward military solution or because of a

\textsuperscript{10} For example, the defender always knows which type of (potential) attacker it faces while the attacker does not know the type of defender. Filson and Weimer acknowledge that this assumption is adopted purely to induce a unique equilibrium in the model.
rare confluence of events that transforms stalemate into cease-fire. Fortna (1998) found
that few if any modern interstate wars resolved major issues in the cease-fire itself.
lending credence to the notion of cease-fires as separate from actual settlement of issues.

A bridge between the intrawar period, the bargaining process, and expectations about
the postwar world is Pillar’s (1983) study of negotiation and war termination. Pillar
delves deeper into the internal processes of war than Wittman or Wagner, but he also
includes feedbacks between the negotiation phases and conflict phases of war. This
comes at the cost of complexity.11 The study is primarily descriptive, trying to
qualitatively tease out the relevant processes using insights derived from formal models:
it is not primarily a predictive work. Pillar argues that bargaining has three phases. The
first is one of uncertainty, where each side begins with an exaggerated position and
reciprocates concessions to demonstrate good will. The second phase is when
concessions have real meaning, and previous concession behavior predicts future
behavior: if one side has an advantage, it is likely to still have that advantage after a
concession by its opponent. In the final phase, negotiators tie their concessions to some
probability of success or failure in the talks, and so behave in accordance with formal
models of bargaining. This melds insights from qualitative work with those gleaned from
formal models of bargaining. Each side can manipulate the other’s willingness to make
concessions through increasing costs: sides may also directly seize what they want
militarily, or take bargaining chips to be traded for what they want in negotiations. Thus
when agreement is difficult, war may be more intense.
Similarly, the rivalry approach to armed conflict allows for prior behavior to be one factor shaping the evolution of war, but also implies that rivalry – the expectation of future conflict, conditions the pre-conflict and intra-conflict behavior of states (e.g. Goertz and Diehl, 1995). Though the primary proponents of this approach have yet to directly study war termination, their hypothesis that expectations of future conflict alter the military decisions of states in the present points to an important conclusion about war termination. If the expectation of future conflict exists during war, then the sides have added incentive to achieve superiority in any settlement, even at the expense of additional costs during the war. This conclusion does not require a rivalry approach to conflict, but the rivalry approach helps to demonstrate the logic of rational decision-making in the context of expected future conflict by moving calculations from the settlement of the war to how the world will look after a particular settlement.

A growing body of literature on war termination emphasizes the role of war-weariness, often characterized as a “hurting stalemate,” in decisions to negotiate. Zartman and Touval (1996) characterize a hurting stalemate as a situation in which both parties realize that neither side can prevail but at least one party is suffering great costs. A related concept is that of “ripeness,” that a conflict must reach a certain stage before negotiation is possible. These works largely presuppose the existence of some agreement both sides would prefer to war and instead focus on the attempts of outside

---

11 It also comes at the cost of incoherence – at several stages of Pillar’s model, infinite regress is predicted, as each side tries to outmaneuver its rival.
12 This concept was developed in detail for the problem of protracted intrastate conflict in Africa, but has been used by a variety of researchers investigating interstate conflict (Zartman 1985).
agents to get the warring parties to realize this fact.\textsuperscript{13} Burton (1990) argues that while settlement may be easier in a sufficiently "ripened" conflict, it is also likely to be less stable because its persistence depends upon the existing balance of power and costs. If these come to change, further conflict is likely. Finally, Crocker, Hampson and Aall (1999) argue that mediation should be difficult at the beginning of a war because each side believes the costs of rejecting an agreement and escalating violence to be low. If fighting becomes very costly, mediators will have a difficult time getting involved because each side's opinion of the other will have hardened, but if a mediator does gain entry into the situation it is likely to prove successful. This analysis melds psychological factors (images of the enemy) and "rational" ones (costs of fighting).

The most useful contribution of work on the intrawar bargaining process has been to connect expectations about future settlements or other outcomes to current bargaining behavior. In many ways, however, models such as Wagner's already incorporate this concept without the added complexity of multiple qualitatively-different stages of bargaining. Moreover, even many of the "nonrational" factors that affect the bargaining process can be incorporated within the idea of war revealing information to each side. The concepts of "ripeness" and "hurting stalemate," in particular, as really about the expectations each side has regarding future costs and the probability of victory. In short, a brief investigation of bargaining process models of war termination reveals few novel testable hypotheses in this work but much added complexity.

\textsuperscript{13} A recent review of qualitative work on mediation and conflict resolution may be found in Miall, Ramsbotham, and Woodhouse (1999, 39-64). I focus here on a few representative examples from this burgeoning field of study.
Post-Agreement Behavior and Enforcement

Another group of authors shifts concern slightly from the idea that future conflict may be regarded as inevitable, to the idea that the agreement itself and its enforcement may alter future expectations. Even in a recurrent conflict, a settlement may be based on the calculations of both sides that cheating is unlikely and that the agreement itself will dramatically reduce the chances of future conflict. This implies that expectations about cheating on an agreement may prevent a war from ending and that the way to end wars is to convince the sides that their opponent will not restart the war or renge on a negotiated agreement. Stein’s (1982) case study of the October War addresses the effects of recurrent conflicts and the fear of recurrence. She argues that rationality is a necessary condition for war termination short of mutual exhaustion or annihilation. Indeed, she argues that when one side is rational and the other is not, the rational side will be reluctant to terminate the conflict with such an irrational opponent, because the opponent might cheat on an agreement or reopen hostilities in an unpredictable manner; therefore, the war will progress to mutual exhaustion or annihilation. The case study emphasizes the role of nonrational calculations, the uncertain connection between non-decisive battles and political aims, the role of outside powers and overlapping conflicts, and the inadequacy of a victory-defeat dichotomy.

More generally, many studies that draw from bargaining literature focus on the effects of future expectations on agreements. These approaches generally attempt to identify the situations that create or avoid incentives for one side to defect or cheat on an agreement.
If defection is in no party's interest, then every party to negotiation will realize this, allowing for a stable agreement. If there are incentives for one or more sides to cheat, however, the agreement becomes much more difficult to reach. I first review some recent work on agreement enforcement in non-war situations and then examine war termination literature that incorporates the findings of these analyses.

For example, Leeds’ (1998) agreement game demonstrates that factors decreasing the likelihood of defection (such as institutions that prevent defection or guarantors that make defection costly) make agreement more likely. This occurs because during the bargaining process each side anticipates the results of a post-agreement fulfillment subgame in which each player has the opportunity to cheat. If cheating is costly, then the outcome of the fulfillment subgame will be the agreed-upon terms. If one or both sides have incentives to cheat, agreement is difficult. Fearon (1998) presents a similar argument, modeling post-agreement cooperation as a repeated prisoner's dilemma. Fearon finds that cooperation is more likely as the "shadow of the future" weighs more heavily on decision-makers, but that this knowledge can lead to intransigence during the initial bargaining phase, as the value of getting one's way in an enforceable agreement is higher than the value of getting one's way in an agreement sure to be violated. The unique contribution of Fearon's approach is that it suggests that bargaining problems will appear to be more severe than enforcement problems, because when agreements are enforceable reaching them is difficult while when they are unenforceable no bargaining—and therefore no breakdown in the bargaining process—ever occurs.
Concern in the qualitative war termination literature about the difficulty of enforcing war settlements precedes much of the above work on international cooperation. Touval (1982) analyzed the means by which parties seeking an end to conflict can manage "the risks of accommodation." Touval argued that in a situation characterized by mutual distrust, it is not necessary to eliminate distrust to reach agreement. Each actor can use probing negotiations to reduce some of the risk of contacting the enemy (a problem emphasized by Iklé). More important are the risks created by the possibility an opponent will renege on a settlement. She lists several risk-reducing strategies that might be employed to increase the probability an opponent will abide by a peace agreement: continuation of armament efforts and alliance-seeking behavior, signing agreements in public to tie the opposing leadership to their terms, fostering of economic interdependence between adversaries, guarantees by outside parties, and gradual implementation of agreement terms. She applies this analysis to the case of Israeli-Egyptian negotiations.

Fox (1970) also emphasized the problem of credible commitment to negotiated war termination, noting that Hitler found it difficult to negotiate a settlement with Britain following the fall of France because he had reneged on so many prior agreements. Handel (1982), emphasizing nonrational factors in wartime negotiation, argues that magnanimity in terms offered to an opponent should increase the likelihood the opponent abides by them in the long run. Quester (1970) argued that unambiguous signals of the intention to make peace would moderately bind those that sent them and thus decrease the incentive to renege on a negotiated agreement to end a war.
Hampson (1997) notes the existence of a security dilemma facing the sides in a war – each side may have an incentive to be the first one to violate an agreement, or may have other incentives to cheat. He argues that such a security dilemma contributes to the psychological and cognitive obstacles to bargaining, by intensifying fears. He argues that confidence-building measures can help ameliorate security dilemmas between the warring parties, particularly if external mediation is involved. The more intense the security dilemma, the more far-reaching the confidence-building measures required to ameliorate it. Aggestam and Jönsson (1997) argue that the implementation phase of an agreement to end a war should be the most dangerous period because it is here that incentives to renege on one’s commitments will be greatest and it is here that uncertainty regarding an adversary’s compliance is greatest. Smith (1995) includes this as an obstacle for cease-fires in any military conflict, arguing that cease-fires are difficult to reach even in interstate conflicts because, among other things, they offer opportunities for the military balance to shift. Finally, an empirical study by Fortna (2000) suggests that peacekeeping can provide a mechanism to make unilateral defection less threatening by making it more difficult to do without being observed.

Werner (1999) focuses on conflict recurrence, but has an interesting insight regarding agreement enforcement. She compares three causes of agreement breakdown and conflict recurrence: failure to resolve important issues, enforcement difficulties, and attempts to renegotiate the agreement. While she finds little evidence that failure to resolve issues causes agreement breakdown, she finds some support for enforcement issues as a cause and a great deal of evidence that renegotiation attempts contribute to
breakdown. She attributes the relative weakness of findings regarding enforcement as evidence of the type of selection bias described by Fearon (1998): unenforceable agreements are seldom made and therefore seldom broken.

This category of bargaining models of war termination suggests that expectations about the postwar world are important determinants of whether combatants will reach an agreement at all. As with absolute war fought to the finish, agreements followed by unilateral defection may be difficult to observe in practice and yet represent risks taken into account in decisions to end a war. What this literature has not yet accomplished is to identify the types of war-ending agreements most prone to defection or the other factors that alter expectations about whether an opponent will defect.

1.14 SUMMARY: A GENERAL STORY REGARDING WAR TERMINATION

Upon examination of root causes, war process, and bargaining models of war termination it becomes clear that war termination is a function of two processes. There is a coercive element to war – combatants can physically seize objectives and in extremis can even disarm their opponents and gain absolute victory. This process is probabilistic – neither side knows how it will turn out, though each will have expectations. In the context of strategic interaction, the notion of preset thresholds beyond which a side is compelled to cry “uncle” and submit to its opponent is not only empirically dubious but also theoretically unnecessary. One’s threshold varies in response to the offer on the table. This is the bargaining component to war. While the probabilistic process of coercion unfolds, negotiation can and does occur. It appears that the most parsimonious
models in this regard are rational choice models of bargaining, particularly those of Wittman and Wagner. Research on security dilemmas and the difficulty of cooperation suggests that models of bargaining should take into account the danger of cheating.

Ideally, a model of war termination would include a model of the war process determining the expectations of each side regarding continued war as well as a bargaining component allowing each side to make proposals. Moreover, this bargaining component should take into account the danger of cheating. Finally, the entire model ought to be consistent with a plausible explanation for war initiation. Eventually, it may be necessary to model a second level of the bargaining process representing intra-coalition bargaining. Of course, this ideal model may not exist in a simple and testable form.

Such a model need not incorporate the many individual and organizational obstacles to correct perception and negotiation, for it has not been demonstrated that these function in a manner inconsistent with the basic idea that as one side gains on the battlefield it becomes less willing to make concessions while its opponent becomes more willing to make concessions. To the extent that attempts to systematically predict "nonrational" factors have been made, their expectations appear largely consistent with Wittman's findings. To the extent that there is unsystematic variation in war outcomes from these factors, they need not be incorporated in a general theory of war termination.

This approach is based largely on studies of organized armed conflict in general and interstate wars in particular. Some have argued that civil wars represent a different type of situation altogether, and that we must revise or discard existing models of conflict to account for them. In order to examine the applicability of this conceptual framework to
the progress and termination of civil wars, one must define what is meant by a civil war and examine how its features differ from those of other types of conflict. search for common characteristics of civil wars that might be problematic for this approach, and review existing work on the subject of civil war termination.

1.2 THE NATURE OF CIVIL WAR TERMINATION

Returning to the beginning of this chapter, the second question is whether a general theory of war termination adequately encompasses civil war termination or a theory specific to civil wars is required. Christopher Coker observed that "when a war ends is a matter of historical perspective, and depends largely on when we date its beginning" (1997, 617). Applying the general story about war termination that I sketched in 1.1 to civil war termination therefore requires examining the general characteristics of civil wars and comparing these to the war characteristics assumed by the story. Therefore, this section attempts to simultaneously clarify the concept of civil war and its characteristics while also addressing putative theoretical distinctions between civil and interstate wars. Accordingly, a number of relatively minor differences are examined in order to satisfy the reader that they are indeed only minor obstacles to the application of general theory.

One indicator that civil wars are qualitatively different than interstate wars is the well-known finding that civil wars are settled less frequently than interstate wars. Statistics vary, but there is widespread agreement that negotiated settlements are much more rare in civil than interstate wars. Stedman finds that from 1900-1980, only 15% of civil wars ended through negotiation, as opposed to 50% of interstate wars during that
period (1996. 343). Pillar found that 68% of interstate wars resulted in negotiated settlements while only 32% of civil wars did (1983. 25). Licklider found that only one quarter of civil wars ended in negotiated settlement (1995. 684): for Kaufmann the figure was just under 30% (1996. 159). Moreover, the government is far more likely to win civil wars resolved by military action than are the rebels (Heraclides 1997: Zartman 1995: King 1997).

A number of differences between civil and interstate wars have been advanced as explanations for these results. For the moment, I treat civil war as simply a severe armed conflict between a government and rebels, a reasonably broad definition that nonetheless excludes massacres or minor skirmishes. I address five proposed differences between civil wars and interstate wars regarding war termination: irrationality, asymmetry, indivisible stakes, and the security dilemma.

1.2.1 CIVIL WARS AND RATIONALITY

A large number (in all likelihood a substantial majority) of scholars who have examined civil wars argue that there are extra factors present in civil wars which make rational models of termination in general, and negotiated interstate war termination in particular, inappropriate tools for the problem. Several obstacles to rational decision-making and rational negotiation processes in civil war have been suggested. I examine
three of these that frequently appear in the civil war termination literature: brutality, irrational leaders, and perverse incentives for leaders.\textsuperscript{14}

\textit{Brutality}

Abraham Lincoln's earlier observations on the development of the American Civil War are equally applicable to many internal conflicts. Viewed from the outside, civil wars often seem to take on a life of their own. Viewed from the inside, civil wars may appear to be traps in which fighting has become futile but surrender means obliteration. The prevailing image of civil wars is one of interminable, brutal conflicts waged in remote locations over ancient hatreds. This image has informed both popular accounts and scholarly studies of civil war.\textsuperscript{15}

Many scholars have noted the brutality of many civil wars (King 1997). Licklider (1993) compares civil wars to family fights in that one has to really know one's opponents to truly hate them. Waterman (1993) argues that since violence creates a need for revenge in victims' minds, and since in many civil wars, civilians identified with an opponent are vulnerable to attack, civil wars ought to be particularly brutal and therefore difficult to resolve. In Waterman's view, this increases the need for the perception of magnanimity in any settlement because the winners can afford magnanimity given the concrete benefits of winning while the losers are aware of the sincere desire for revenge.

\textsuperscript{14} Arguments regarding ethnicity, ideology, separatism, or the nature of guerilla operations are objections to the applicability of "rational" models to particular types of civil war, not to civil war in general. As such they are examined separately from general objections to rationality in civil wars.

\textsuperscript{15} See for example Kaplan's (1994) description of state breakdown and civil war.
on the part of the winners -- and therefore recognize foregone revenge as a real
concession. Holl (1993) seems to raise the possibility that war crimes committed in a
civil war are more likely to be prosecuted after the war than those committed in an
interstate war, because restoration of the normal judicial process creates a mechanism for
prosecution. If, as Holl argues, civil wars also feature more atrocities than most interstate
wars then perpetrators in civil wars are likely to be especially concerned about the
possibility of postwar prosecution.

What the brutality argument amounts to is that either there is simply another issue to
negotiate in civil wars that is not normally negotiated in interstate wars or that people "go
mad" with revenge. The first of these need not present any problem with respect to
application of general war termination theory. The second is perhaps a specific condition
of some wars, but demonstrably false as a general proposition. Even Mozambique's
brutal civil war, during which the RENAMO rebels were responsible for perhaps 97% of
the 200,000 civilians murdered, was ended by a negotiated agreement providing for
Nor did the rebels' tactics of recruiting child soldiers, often forcing them to kill their own
parents, and amputating limbs of civilians to spread terror prevent Sierra Leone's RUF
rebels from reaching a negotiated agreement with the government (Shearer 1997).
Negotiation and compromise appear under the most surprising conditions.
Irrational Leaders

Stedman (1996) identifies a number of potential obstacles to the negotiated settlement of civil wars. One of these focuses on the personal characteristics of the leadership of each side. He argues that leaders may be personally inflexible or short-sighted. It is easy to find examples of leaders that wanted to keep fighting long after it became clear that they had little chance of winning or leaders with unrealistic expectations of victory.

An instructive example may be the Huk rebellion in the Philippines following that state's independence. Eduardo Lachica cites a former Huk education and propaganda operative's report that the Huk leadership had planned for "geometric expansion" from the 10,000 fighters they had in July 1950 to 172,000 in September 1951. This was to be accomplished through a pyramid of recruitment, with each member recruiting three others every 90 days, these three then recruiting three more, and so forth (1971, 127). Given the high attrition of Huk forces at the time and the fact that their numbers had already declined from their peak, this plan was optimistic to the point of being fantastic.

However, it is also easy to find counter-examples of leaders who use extremist rhetoric but then turn out to be remarkably flexible when a favorable agreement is offered.¹⁶ Moreover, intransigent leaders exist in interstate wars as well as intrastate

---
¹⁶ In 1821, Spanish liberals demanded a more liberal constitution similar to the French Charter of 1814. King Ferdinand VII refused, insisting that the divine right of rulership was the will of God and therefore not negotiable. He was promptly overthrown. After Ferdinand eventually made his way to the safety of France, he sought and received French military assistance in restoring him to the throne — by promising France he would adopt the very same constitution he had previously rejected. Of course, this example of flexibility comes with a caveat — once his power was restored, he abrogated the liberal constitution (Carr 1966).
wars. This argument is similar to Sigal's indictments of rationality, and therefore many of the same responses apply.

It is also possible that even if leaders are irrational, their followers will collectively behave as if they were a rational actor. Returning to the Huk example, the Huks rebelled because of government forces' mistreatment of farmers and government policy that siphoned wealth from farmers to urban areas. They called for the overthrow of the government and rapidly gained ground; within three years they were a serious threat to the government. The government did not actually negotiate with the Huks. Instead, it changed policies to make farming more profitable, dug some wells in rural areas, and restrained its police from molesting farmers. Simultaneously, it stepped up its military campaign. The Huk leadership did not change its strategy one whit; it continued to fight government forces. Yet the war ended the following year by most criteria. The farmers in the Huk movement simply went home and resumed farming, finding that the benefits of farming now outweighed the expected benefits of fighting. The Huk leadership was captured about 15 years later and some of them signed an instrument of surrender, though others remained at large (Lachica 1971).

*Perverse Incentives for Leaders*

It is possible to create a variant of this argument which relies on rational choice. Stedman suggests that a leader's drive for power may make compromise difficult. Because the war or a total victory in it may be the key to the leader's position. Rupesinghe and Anderlini (1998) refer to leaders' fears that they will become "casualties
of peace.” In such cases, we can hardly say that these leaders are irrational, though the decision-making process with respect to negotiation may appear irrational from the perspective of total gains and losses for that entire side.

What if a leader can maintain power only when there is a state of war? It may be the case that institutional structures affect the degree to which leaders feel the pain of war and gain from a peaceful settlement. Ultimately, the effect of institutions on civil war termination is an interesting empirical question, but presumably would be easier to address after a baseline model of civil war termination has been constructed. If an institution-free model works well, then there is no need to complicate it. Finally, it is also possible that institutions simply do not vary much in civil wars—these conflicts usually involve an autocratic or semi-democratic government (Hegre, Ellingsen, Gates, and Gleditsch. 2001).

Another argument against “rationality” in civil war is that the rhetoric of total war makes compromise difficult for leaders (Stedman. 1996). Prior rhetoric can make opponents reluctant to believe the sincerity of a peace offer and can also make it costly for a leader to allow followers to find out about any such overtures. While there is an entire literature on the phenomenon of “tying hands,” or constraining oneself to gain an advantage in negotiations, this phenomenon is hardly unique to civil wars (Schelling).

There are aspects of civil wars that do seem to inhibit rational decision-making, but these factors are also present in interstate wars. On this dimension, the difference between civil war termination and interstate war termination is one of degree rather than kind. It is not obvious that a general theory of war termination incorporating rationality
needs to be discarded when analysis turns to civil wars. In the long run, it may be best to incorporate an institutional component reflecting the degree to which potentially irrational leaders are constrained in their decision-making authority. In the short run, there is some reason to believe that, when taken as a whole, the sides in a civil war may behave in a manner consistent with a basically rational process. Therefore, the initial application of war termination theory to civil wars need not incorporate an institutional or psychological component.

1.2.2 ASYMMETRY IN CIVIL WARS

"The most striking characteristic of internal conflict," observed Zartman in his study of civil war termination, "is its asymmetry: one party (government) is strong and the other (insurgents) is weak. This is true until tables are finally turned at the end (if they can be), and it is true not only in regard to the military components of power but also in regard to less tangible components such as legitimacy" (1995. 7). While an interstate war is by definition fought between two states, an intrastate conflict is fought between some subnational force and the government of a state. The difference is more than semantic: the argument is while a state is characterized by defined territory, leadership, and legitimacy, a subnational military force may have none of these. I address four types of asymmetry frequently found in the literature: military power, legitimacy, motivation, bargaining power.
Military Power

The most obvious asymmetry is in the area of military power. Governments usually begin civil wars in command of the regular armed forces. Not only is this likely to give them a quantitative edge in terms of personnel, but it is likely that they will enjoy a qualitative edge as well, with previously trained units equipped with relatively heavy weapons. Russell (1974) went so far as to argue that the acquiescence of a state’s armed forces was necessary for revolutionary success while Edmonds (1972) simply noted the critical role played by these units. Governments typically start with some form of regular logistical support for their troops, enabling them to undertake extended military operations. Wilkinson (1975) found logistics to be a critical determinant of the military prospects of each side in revolutionary civil wars while Ramsey (1969) acknowledged the problem of supply in peasant rebellions. Other studies addressing the general asymmetry of power in civil wars include Rice (1988), Holl (1993), and King (1997).

This asymmetry need not concern scholars of war termination who wish to apply general insights to civil wars, for many interstate wars are military mismatches as well. In addition, it is simply not the case that governments are always stronger than rebel movements, even at the beginning of a civil war. The Spanish Republicans quickly found themselves outmatched by Franco’s rebel forces on the battlefield (Wilkinson 1975) while “warlords” often control private armies that surpass that of the central government (Rich 1999).

A variant of this argument is the external supply hypothesis, which gives pride of place to the seemingly technical issue of arms imports in explanations of civil war
initiation and termination. Brito and Intriligator (1990) examined the relative explanatory power of guerilla's possession of territory, the ratio of government to guerilla forces, and the guerillas' ability to obtain weapons on the outcome of guerilla war and concluded that access to weapons was the most important determinant of rebel success. Spear (1996) argues that the presence of available arms for rebels is a necessary condition for the onset of internal conflict. Klare (1999) suggests that recent diffusion of light arms manufacturing capacity and the weapons themselves have increased the number and intensity of civil wars. If importation of arms was a necessary condition for successful rebellion, a new bargaining option – dealing directly with the third-party arms supplier – would be created for the government.

There is some qualitative support for the idea that arms importation is more important for rebels than governments. During the 1880 revolt of Buenos Aires, the rebel army defeated the Argentine government in battle, but was left with so little ammunition that it essentially surrendered shortly after its victory (Akers 1912). Guatemala's EGP rebels had the ability to enlist thousands of campesinos in the late 1970s but simply couldn't arm or the supply "the vast majority of them" (Perera 1993). Jackson's history of the Darul Islam rebellion in Indonesia states that "the most important social fact concerning the Dar'ul Islam recruiting is that the manpower reserves were always much greater than the arms available. and down to the bitter end the movement was capable of recruiting replacements for the approximately one thousand combat fatalities incurred during each year of the rebellion" (1980, 14-15). Finally, accounts of the Sierra Leone civil war
emphasize the role that control of diamond mines and the resulting ability to buy arms for abroad plays in the conflict (e.g. Shearer 1997).

It does seem clear that arms imports play an important role in most modern civil wars, but it falls far short of a structural difference between civil and interstate wars. There is little justification for adding arms imports to a general model of war termination except as an indicator of military strength. Certainly examples exist of successful revolts without imported arms, so it cannot be a necessary condition for rebel success. Besides the aforementioned examples of direct military revolt, there are other cases in which civil wars occurred without arms importation. Before 1865, firearms played a minor role in campaigns against China’s Nien and Moslem rebels. For the rebels had few of them and the government forces rarely used theirs, which mainly consisted of muskets unsuitable for use against cavalry and unusable in rain. However, with the government’s purchase of modern rifles in 1865, it gained a distinct military edge, and a primary Nien aim in later battles was to capture rifles for their own use (Chiang 1954; Jenks 1994). And the 1907 Rumanian peasant rising was carried out with little more than some revolvers and cudgels (Fotino and Iordache 1991).

Sometimes the government is the best source of weapons for the rebels, even without defections or corruption. During the Canudos Revolt, the rebels started out with few weapons. However, the government sent three expeditions against the rebels – each one larger than the last, but well short of the force needed for victory. In succession, the rebels destroyed expeditions of 100, 550, and 1300 men in scenes reminiscent of Custer’s last stand, using the arms captured from each force to defeat the one that followed.
Eventually the government sent a massive fourth expedition, which finally destroyed the rebels (Schneider 1991).

The conclusion one can draw from these examples is that importation of weapons is an important determinant of rebel military strength and therefore contributes to asymmetry in capabilities. However, it does not constitute a necessary condition for the continuance of rebellion. If this is correct, it means that rebel armament is primarily a power measurement issue and not an independent path out of civil war.

*Legitimacy*

The government also has an advantage regarding legitimacy. The government is a previously constituted and internationally recognized actor. It controls the organs of state power. It may enjoy international trade agreements, diplomatic representation, popular legitimacy, or foreign allies (King 1997). Pye (1964) suggests that the government's legitimacy or lack thereof quickly becomes the focus of civil conflict, for the rebels, being generally less well-known and less transparent than the government, will often be judged by the actions of the government. Arbitrary repression by the government will decrease its legitimacy and hence increase the legitimacy of the rebels, according to Pye.

One effect that this may have on civil war termination is to inhibit negotiation. Observers have long noted the tendency of governments to minimize the extent of armed opposition in the initial stages of rebellion: frequently governments dismiss reports of rebellion, instead referring to “criminals,” “bandits,” or “terrorists” (Pye 1964: King 1997: Rupesinghe and Anderlini 1998). Zartman (1993, 1995) notes that recognition as a
political entity is often the central demand of a rebel group: a government's agreement to negotiate with them is therefore tantamount to recognizing their legitimacy: "The most important deal is made in the agreement to negotiate" (10). This suggests that the first negotiated offer made by a government has a political, and possibly military, cost to it; legitimization of the rebels may increase their ability to recruit soldiers (Pye 1964) or otherwise enable them to balance the advantages held by the government.

This argument is difficult to reconcile with theories of war termination drawn from interstate experience. While it is true that Iklé and others have addressed the potential costs to a state of being the one to initiate negotiation, Zartman makes a different argument altogether. For he states that for one side only, the opening of negotiations carries a cost. What is missing from the argument is a sense of proportion – just how important is legitimacy when each side decides whether to negotiate? The argument does seem to assume that negotiation must be formalized. If governments can bargain through signals short of direct offers, as described by Pillar (1983), then the effects of negotiation on legitimacy may be a relatively minor theoretical concern.

Motivation

A third asymmetry suggested by studies of civil war termination is one of motivation. Many authors hold that rebels have greater resolve than governments. for several reasons. First, the issue of the rebellion has greater salience for the rebels than for the government. for the government must deal with all of the ordinary political, diplomatic, and economic issues of governance in addition to the rebellion itself (Zartman 1993; King 1997).
Second, the rebels may have a higher cost tolerance than the government. Karl Deutsch (1964) noted that in the American Revolution, it was estimated that colonists were split roughly evenly between support for the rebels, support for the British government, and neutrality. Yet pro-independence forces recruited approximately eight colonists for every one colonist recruited by loyalist forces. Deutsch suggested that this was because the depth of support for their position was greater among pro-rebel colonists than pro-government colonists. Pillar (1983) addresses the issue at a higher level of analysis when he posits that the existence of a rebellion ought to be the zero-point for rebel’s calculations of costs and benefits. Zartman (1993) concurs, noting that for rebels the life as a rebel comes to be seen as normal. On the other hand, rebellion is a political nightmare and embarrassment for a government. The mere existence of a rebellion calls into question state sovereignty (Licklider 1993; Edmonds 1972; Schock 1996; Wagner 1993). As Henry Kissinger once remarked, “The guerilla wins if he does not lose. The conventional army loses if it does not win.”

Yet these asymmetries may be overstated. With regard to salience, it may be the case that rebellions themselves acquire many of the functions of government as they expand, and that gaining control of substantial income may reduce their incentives to press forward (Wilkinson 1975; Rice 1988; Coker 1997). The rebels “have” to address the concerns of the population under their control in the same sense that the government “has” to address those of its citizens. Some rebellions create alternative structures of governance while others do not. Moreover, the salience of the rebellion for the

---

government may be higher than one might think, for if ordinary policy is one way to suppress rebel recruitment (Lichbach 1995; Pye 1964) then what we may be observing is decreased salience of the strictly military issue and increased salience of other areas of policy, but no difference in the overall salience of the struggle.

With regard to cost tolerance, it certainly seems plausible that one side may be more tolerant of costs than another in a civil war. The question is to what degree this differs from the situation in interstate war. The argument has certainly been raised in the context of the American-North Vietnam conflict that the government of North Vietnam was much more tolerant of costs (Pillar 1983). Moreover, differences in cost tolerance are simply differences in the weighting of costs by each side, equivalent to simply increasing the costs for one side and/or reducing them for the other. These pose no fundamental problem to applying general war termination theory to civil wars.

Finally, the notion that civil war represents “life as normal” for rebels is by far the weakest variant of the asymmetric motivation argument. Even if one “zeroes out” the costs of a rebellion for the rebels, surely those benefits which are denied under such conditions should affect the utility of various outcomes. As an analogy, consider areas of the world in which malaria is endemic. While the threat of malaria may be such an ordinary part of life as to not even receive consideration, surely the prospect of immunity to its effects would be attractive if the relative benefits of being disease-free were made clear. A wartime populace may adapt to rationing and even deal with it with good humor, but we would not expect such people to decline an increase in rations. Guerrillas may take it for granted that they won’t live to reach old age and learn to accept this
probability, but this should not be taken as evidence that they place no value on extending their lives. Finally, this analysis fails to explain why many rebels do in fact "drop out" of civil wars given the right incentives (Lichbach 1995), as in the Huk conflict (Lachica 1971; Rice 1988). 18

In short, analysts may have mistaken coping strategies and acclimatization to rebellion as the very different condition of indifference to rebellion. There may indeed be greater cost-tolerance on the part of the rebels in the majority of civil wars, but this does not require restructuring of a general theory of war termination: it merely provides additional information with regard to its application.

Bargaining Power

Bargaining power is related to all of the asymmetries mentioned in addition to other factors. Alterations in expectations about fighting or in the utility of particular agreements are not threats to the application of general war termination insights to civil wars and so need not be discussed at this point. However, there appear to be asymmetries in negotiation that are not adequately captured by the interstate war termination literature. I briefly examine three of these and then suggest an abstract way in which those studying civil war termination might alter the general story to take into account this feature of civil wars.

18 The reader will doubtless note a potential contradiction here: If the rebels are usually more or less indifferent to the fact that a war is underway, how can it be the case that winning that war is the most important thing in the world to them? These conditions need not be inconsistent if, for example, rebels are highly motivated by the prospect of
As noted above in the Huk rebellion and presented as a general condition in Lichbach (1995), governments can reduce the ability of rebels to recruit by simply implementing reforms without ever bringing them to the negotiating table.\textsuperscript{19} For example, expanding political opportunities for dissenters may reduce the strength of violent opposition (Schock 1996). While rebels, too, can create some of the institutions characteristic of government, these alternate institutions are seldom as well-developed as those of the government.

Control of legislation and the national treasury also makes it easier for the government to organize collective action and punish defectors (Lichbach 1995) which may in turn make it easier for the government to make credible offers.\textsuperscript{20} It is known that finding valid spokespersons for each side can be difficult in civil wars (Zartman 1995). Holl (1993) notes that often rebel groups are so disorganized that even negotiating a surrender can be difficult due to dispersion of command.

Another bargaining advantage held by the government is its ability to control the message of the rebels. Pye (1964) emphasizes the role of governments in defining the politics of the opposition because its institutionalized connections with the populace allow it to provide information more easily than the rebels. Rupesinghe and Anderlini

\textsuperscript{19} During the Second Polish Revolt, the Russian government dramatically undercut the ability of rebel leaders to recruit peasants when it abolished serfdom in 1864 (Pawlowski 1978).

\textsuperscript{20} Here I refer to credibility as the degree to which an opponent knows the offer is a valid one that really expresses the bargaining position of a side, not the degree to which an opponent believes a proposed agreement will be honored. This latter type of credibility is examined below in detail.
(1998) note that by labeling the rebels as terrorists, bandits, or communists, the government can alter the perception of rebel demands among the populace.

While incorporating institutions into the general war termination story may be premature given the added complexity they would introduce, there may be an abstract way to represent the superior ability of the government to make clear, credible, and consistent offers. If, in general, rebels in civil wars have difficulty communicating a negotiated offer because of government propaganda, refusal to hold direct negotiations, pre-emptive reform legislation, or the difficulty of delegating negotiating authority to a credible spokesperson, then a simple way to represent this is to remove the rebels' ability to propose settlement terms at all. This does not strictly correspond with reality, for rebels can and do make arguments, but it provides a way to distinguish the much less credible rebel offers from the more credible government ones. If government offers are regarded as real policy by the populace, the rebel leadership, and the international community but rebel offers aren't, then it may make sense to treat this situation as if the government held the power to make proposals.

Having examined the four most commonly posited asymmetries in civil wars, it is clear that governments are often stronger and more legitimate than rebels while rebels are often more motivated than governments. It is also clear that, these factors notwithstanding, governments generally hold a bargaining advantage in civil wars derived from their control of legitimate political institutions. To the extent that Deutsch is correct about depth of motivation leading to increased recruitment, the asymmetry in motivation is simply a counterbalance to the asymmetry in military organization and
materiel. There are subtleties here that are not captured by the general story of war termination as modified above, but there is no prima facie reason to believe that these will be critical to the success or failure of a theory of civil war termination.

1.2.3 INDIVISIBLE STAKES

Virtually every study of civil war termination addresses the nature of the stakes in a civil war. In general, two arguments are advanced. First, the "stakes," or the issues over which bargaining occurs, are said to be less divisible in civil wars than those in other conflicts. Second, a related argument holds that the nature of the issues in a civil war propels the conflict toward absolute or total war. Both arguments rest more on hasty generalizations about the nature of civil conflict than on genuine bargaining dilemmas.

Holl (1993) describes civil war as a zero-sum conflict in which no compromise is possible. For Zartman (1995), since recognition is rebels' primary demand it is the stakes in the civil war and indivisible. For attempting to divide it is to engage in negotiation, which by its nature involves recognition. Of course, whether zero-sum conflicts can result in compromise depends on how one defines the term, but agreeing to split the difference is presumably a compromise and quite possible in a zero sum situation. Similarly, Zartman's argument confuses the rebels' strongest demand with the one to which they are most attached. Recognition is primarily an instrumental demand, designed to gain access to negotiation over the issues the rebels really care about. A negotiation in which the government showed up and demanded unconditional surrender would surely be less than half as valuable to the rebels as one in which the government
showed up and presented its own unconditional surrender. If this is true, the difference between these two extreme negotiating positions is more important to the rebels than the difference between negotiation and no negotiation.

There are in fact no truly indivisible stakes in civil wars. Given virtually any issue that has been fought over, proposals for division have been made. Take the extreme case of truly genocidal opponents, each of whom desires the extermination of the other for its own sake. Assume that each side values its own survival more than it values the death of its opponent. In this case, "live and let live" marks the 50-50 point on the issue of extermination. "Only kill half of us" marks another point on this disturbing continuum of divisibility. More plausibly, civil war might be fought over territory or perhaps control of natural resources or tax revenues. These are continuously divisible, whether by boundary line or percentage of revenues.

Even that essential function of a state, the authoritative allocation of resources, is divisible. Power can be divided: the sides could even take turns. I will not dwell on the forms such division of power might take except to note that it has occurred. In the 1861 civil war between Buenos Aires and the Argentine government, the sides found a way to divide the issue of centralized control over the city – Buenos Aires was incorporated into the Argentine Confederacy but the Presidency of the new union was held by the rebel leader (Bethel 1993).

---

21 If for some reason preferences were reversed and the desire to kill the opposing side was stronger than the desire for survival, then the absurd outcome of "let us kill half of you and we'll let you kill half of us" would represent a compromise (albeit not a Pareto-"optimal" one).
Suppose that I am incorrect and that governance is indivisible. This does not mean that compromise is impossible, for while the stake may be indivisible the probability of receiving it is not. It is at least theoretically possible to construct a lottery in which each side has some probability of receiving the stake. This might be done by transferring the decision to some third party, actually drawing lots, or constructing some other probabilistic system for allocating government power. 22 Again, it is not necessary to go into the specifics at this point—it is only necessary to establish that the stakes in civil wars are probably divisible and that even if they aren’t, this does not mean that compromise is impossible. In Spain’s First Carlist War, forces loyal to three-year-old Princess Isabella II and regent Maria Cristina fought adherents of Don Carlos over which was the rightful heir to the throne of Spain. Even in the case of something so apparently indivisible as succession in a monarchy, an offer was made—Don Carlos suggested that he wed the princess, thus providing for Cristina’s current rule and securing a position for himself at some point in the future (McCabe 1932; Alba 1978). 23

If stakes are divisible, there remains the question of whether competing over them necessarily devolves into absolute or total war. Holl (1993) argues that the political and military objectives in civil wars are tightly coupled, for the power to destroy an opponent is also the power to set policy and govern. As Wagner (1993) states, the losers in a civil war don’t retain their identity at the bargaining table. Stedman (1996) argues that civil wars become total wars, which are more difficult to negotiate than limited wars. His

---

22 Enforcement of such bargains is a separate issue that I address below.
23 Given the obvious personal security dilemma created by such an arrangement, Cristina declined the offer.
definition of total war is quite similar to that of Hobbs' (1979) definition of absolute wars as those waged over unlimited issues. Liska (1982) would seem to agree, listing civil wars over succession as the most dangerous because the stakes are nothing less than the survival of each party. Stedman notes that the only end to a total war is the complete elimination of one's opponent. They, rather than their particular behavior, are perceived as a menace and a threat. Certainly this is consistent with the "fight to the finish" model of civil war presented by Gershenson and Grossman (2000). As Hans Speier observed, "peace terminating an absolute war is established without the enemy" (1952: 223. quoted in Coser 1967).

In order for this argument to threaten the application of my story about war termination in civil wars, two conditions must be met. First, total wars need to be less negotiable than limited wars. Second, something about civil wars needs to make them much more likely to be total wars than is the case with interstate wars. The case for the first of these is not as strong as one might think, given the large number of authors who espouse the position. First, as Sigal and Kecskemeti noted, the US-Japan war ended just short of an unconditional surrender, despite the fact that this war was the archetypal total war.24 Despite the heavily charged racism underlying the rhetoric and practice of this war (Dower 1986), the United States was in fact willing to settle for less than the destruction of the Japanese, allowing some of their most important cultural symbols to remain (i.e. the Emperor).

24 Of course. Rome and Carthage serve as a counter-example.
Stedman seems to acknowledge that total wars can be negotiated, but responds (somewhat tautologically), that if they ended it must have been because they changed from being total to limited wars:

"This does not rule out negotiation, but it means that political settlements to civil wars will depend on the willingness and ability of individuals to change their perceptions and definitions of conflict. This can happen even in the most entrenched conflicts: contrast the South Africa of 1995 to the South Africa of 1989, when a genocidal race war seemed inevitable" (1996, 346-7).

While it may indeed be the case that intangible perceptions can prevent conflict resolution and that those perceptions must change in order for a war to end, it is far simpler and just as consistent with the available evidence to argue that just because a war is against a hated enemy and leader’s use extreme rhetoric to mobilize support for the war doesn’t mean that settlement is impossible. In the absence of successful predictions using the total/limited war distinction, and since in fact many civil wars do end in compromise (Licklider 1993; 1995, 1998) it is unnecessary to add this component to a general model of civil war termination.

The second premise of the argument is also open to question. Stedman argues that civil wars are more prone to become ideologically-based total wars. However, his arguments also apply to many interstate conflicts. He argues that civil wars generally follow the failure of a government to meet more limited demands, yet it is also a feature of interstate wars that most of them appear to follow the failure of one side to meet the prewar demands of its opponent. Second, he argues that war brings about a critique of the government that establishes the entire political system as the cause of the war, thus making negotiation more dangerous for the leader and causing the leader to take actions
that appear to reaffirm the critique. This is consistent with Waterman's (1993) argument that in some civil wars, even a chastened, legal opposition to the government will not be tolerated. While the government would no doubt prefer the rebellion to disappear, this is doubtless true of opponents in some interstate wars as well, and it doesn't explain why some civil wars do in fact end in negotiation.

There is good theoretical reason to believe the stakes in civil wars are divisible either by direct division or by lottery. The practicality of these solutions is another matter, but power-sharing arrangements have been negotiated, suggesting the notion is not foreign to civil wars. In addition, there is nothing intrinsic about civil wars that compels absolute or total war, nor are such wars immune to attempts to negotiate their termination. Perhaps the lesson from these arguments is not that compromise is impossible, but that it is seldom chosen in civil wars. That being the case, I turn to what has become the standard explanation for the rarity of compromise solutions in civil wars: the security dilemma.

1.2.4 SECURITY DILEMMAS IN CIVIL WARS

For many scholars, what distinguishes civil wars from interstate wars and accounts for the paucity of negotiated settlements is the nature of the security dilemma faced by the participants. The earliest direct application of the security dilemma to civil wars was a 1993 piece on ethnic wars by Barry Posen, which linked it to state disintegration. He noted that when government is too weak to protect groups, they must take measures to defend themselves. Yet these very measures increase insecurity among other ethnic groups. He argued that war risks are highest when each group has armed infantry and
little else. for ethnicity can provide a mechanism for motivating troops. He further argued that motivated infantry are an offensive threat to other groups, which are then compelled to mobilize and motivate their own infantry. Posen's argument is closest to the security dilemma as conceived in interstate arms control negotiations, and few have explored this aspect of civil wars.

Work that followed Posen has largely focused not on the prewar security dilemma and armaments but rather the postwar security dilemma, which is really an enforcement question. Stedman wrote that negotiation in civil war raises the specter of this postwar security dilemma: "political settlements in civil wars require the parties to disarm and form a single army and government. This creates intense security concerns: the parties will face worrisome military vulnerabilities" (1996, 343). King (1997) also warns of the dangers inherent in integrating the armed forces of the combatants: each will have an incentive to hold back some of its weapons and soldiers, wait for its opponent to disarm, and then renege on the settlement. The rebels may be particularly prone to this form of cheating, because possession of weapons by unauthorized personnel is normally a crime in itself, creating an extra incentive to keep information on arms private (Spears 2000).

In interstate wars, we expect an agreement to be self-enforcing for some period of time because each side expects the renewal of conflict to produce pretty much the same result as the last war. However, in civil wars, the sides do not normally have the luxury of retaining armed forces to guard against attack: a state must have a monopoly on the use of force in its borders. Part of the very definition of a state is effective control over

---

territory, and if two militaries exist effective control is denied to either. Wagner (1993) argues that total victory by one side may create a more durable peace than a negotiated agreement, precisely because it avoids the security dilemma of postwar demobilization and disarmament.

This rationale is compelling, and though security dilemmas exist in interstate wars, the same security guarantees may not be open to the combatants in civil wars. This simply reinforces the need for representation of the security dilemma in a theory of civil war termination. Most work on the resolution of security dilemmas in civil wars has focused on either third parties willing to punish defection or self-enforcing provisions that minimize the benefits of defection. I address each in turn, taking care to examine how each approach conceives of the security dilemma.

*Third Party Guarantors*

The seminal work on security dilemmas in civil wars is Walter’s (1997) study of negotiation in civil war. She argues that neither party can trust the other to abide by the terms of agreement, nor is any system the two parties can construct proof against defection. Each sees some advantage to reneging on its promises and attacking the other when its guard is down. Thus, only civil wars in which there are third-party guarantors for peace agreements will be ended via negotiated settlement. Some form of intervention or mediation is thus a necessary condition of compromise outcomes in civil wars.

Walter’s descriptive formulation is essentially that of a prisoners’ dilemma, for she assumes that there is always some positive incentive to defect, even if the opponent
cooperates. This is a strong assumption, for it would be more general to simply assume that there are costs and benefits associated with both defection and cooperation. For example, it may be the case that war is so costly that neither side can expect a quick victory even if it cheats. A recent analysis I co-authored suggests that in battles, attackers gain little from increased relative strength (in terms of personnel) until they have a large (perhaps 4:1) advantage over the defender, at least in some eras and under some conditions (Stoll and Dixon 2001). If true of entire armies, this suggests that there may be a rather large zone of security in terms of the force ratio between the sides in some wars.

An example of this possibility in a civil war is a letter that President Lincoln wrote during the American Civil War. In the letter Lincoln noted that from the disposition of forces, it was evident that two soldiers could successfully defend against three, and recommended shifting forces from areas where Union troops outnumbered Confederates by 3:2 so that the ratio would be 2:3, thus freeing up a large force for employment elsewhere (Dupuy 1987, 32-3). Had Union and Confederate forces been integrated into a new army at a gradual rate, there might have been very little threat to either side’s security, even if one side went from a position of moderate weakness (2:3) to one of moderate strength (3:2). Perhaps both sides would have concluded that even though they could gain from defection, the costs associated with the resumption of hostilities would outweigh the benefits. It is possible that even if the advantage conferred by defection was very large, costs of defection would outweigh benefits: “After all, crushing the
opponent has its costs, not least image-wise, both nationally and internationally, and could lead to deep seated resentments against the 'strong'" (Heraclides 1997, 689).

Others have challenged Walter's approach to civil war termination. Hartzell (1999) fails to find a significant relationship between third-party guarantors and subsequent settlement stability (though the relationship is in the expected direction), which calls into question the necessity and sufficiency of such guarantors. While Hartzell notes that settlement stability is not the same as settlement establishment, Walter's description suggests that the sides should only reach agreement if they believe it will prove stable. Moreover, Hartzell notes that in order to work, a third party guarantor must be credible. Yet it seems unlikely that a third party could credibly threaten both sides. Fearon (1998) also raises an objection to Walter's argument that international guarantors can promote civil war settlement by noting that such commitments by international organizations will rarely be credible.

A similar critique of the possibility of third-party intervention as an agreement enforcement mechanism is raised by Cooper and Berdal (1993):

"If agreements are shaky, can outside interventions be used to enforce them? The issue of whether peacekeeping forces should engage in enforcement action if parties to a dispute renge on a settlement…requires careful consideration. The 1000 Indian lives lost in Sri Lanka were seeking to impose an agreement. The implication is that, if an agreement needs to be enforced, it is not really agreed. If peace, or some "agreement" is to be enforced in these circumstances, it can be done only by imposing heavy costs or defeat on the other side. This will not be easy, especially in ethnic conflicts…. if (outside intervenors) find themselves in direct conflict with an ethnic insurgent group, it will almost always be an unequal struggle. Because the adversary…will be willing to pay almost any
price and suffer enormous losses...survival can provide a justification for almost anything” (201).

They suggest that outside intervenors that intervene for peace are likely to prove unequal to the task of paying such a high price themselves. On the other hand, intervenors with a national interest in the outcome of a civil war may be prepared to accept the high costs but are likely to favor one side over the other.

Werner (2000) argues that third parties have historically had fewer interests in civil wars than interstate ones: if this is true, credible guarantors may be rare. Providing further evidence that national interests of potential guarantors lead to particular kinds of guarantees, Harty (1999) analyzes four of the six civil wars that Walter describes as having a third-party guarantor in greater detail. She finds that in three of the four cases, the third party did not provide an undifferentiated security guarantee to the parties, instead threatening only one side (Syria in Lebanon) or explicitly declining to enforce the terms of an agreement (the British Monitoring Force in Rhodesia/Zimbabwe and international forces in Nicaragua). These results suggest that compromise occurs even without a guarantor to ensure the security of both sides.

Finally, a number of analysts argue that a third-party guarantee may also encompass peacekeeping operations (Werner 1999), compliance monitoring (Tanner 2000), or even secondary sanctions that target any would-be arms supplier to either side (Cooper 2000). Doyle and Sambanis (2000) maintain that deterring defection may require international observers, peacekeeping, or peace enforcement depending on the characteristics of the civil war. The lack of consensus on what constitutes a third-party guarantor reinforces the notion that perhaps other forms of guarantees exist.
Self-Enforcing Agreements

There may be alternative ways in which the actors in civil wars can overcome security dilemmas without outside assistance. Perhaps an agreement could include transparency in the demobilization process so that defection may be detected early. Tanner (2000) suggests that the provisions of an agreement might contain their own “fail-safe” provisions designed to minimize incentives to cheat such as a slow demobilization process as in El Salvador or the preservation of a small armed force for each side as in Cambodia. Similarly, Hartzell (1999) identifies “institutional guarantees” within peace treaties such as construction of an entirely new armed force composed of a certain number of troops from each side and additional new recruits or even a provision to allow each side to retain an armed force (she provides Yemen, Nicaragua, and Bosnia’s Dayton Accords as examples of such provisions). Some of the institutional guarantees she lists include:

- Proportional or balanced integration of each armed force
- Appointment of leaders of the weaker side to key leadership positions
- Allowing antagonists to keep their own armies

Recently, Walter (1999) has suggested that even after initial security concerns are allayed, the problem of credible commitment remains, for each party must continue to honor the agreement. She notes that key provisions have often been drafted in a deliberately vague manner, giving each side the opportunity to exploit its rival and creating the danger of a new civil war. Similarly, while Snyder and Jervis (1999) raise
the prospect of delegation to a third party or balancing power as methods of resolving the security dilemma in civil wars. They warn that overcoming the security dilemma (fear of attack by one's rival) does not overcome predation (desire to change the status quo). These concerns fall closer to the realm of war recurrence and war initiation than to war termination. For presumably any such predation takes place within the newly constructed domestic regime, and may constitute normal politics rather than armed conflict.

1.2.5 SUMMARY: A STORY OF CIVIL WAR TERMINATION

The literature on security dilemmas in civil wars has helped refine the story of war termination. I recapitulate that story here with the added insights gained from examining characteristics of civil war. Civil war termination is a function of two processes. There is a coercive element to civil war, a process of warfare about which each side has expectations. There is also a bargaining component to civil war. Governments have the power to propose agreements in a way that rebels cannot. However, each side does have the power to veto an agreement – as Rice notes, "it takes two to make peace but only one to make war" (1988, 1). Therefore the government compares making an acceptable offer to the rebels to continued warfare, evaluating the costs and benefits of each. The rebels similarly weigh the costs and benefits of accepting an offer from the government. If one is made, against those from continuing to fight. Besides the actual division of the stakes in an agreement, its value to each side depends on the incentives each has to renege on its implementation. Those incentives may depend on the nature of combat, the provisions or
guarantees in the agreement, the costs of war, or the military advantage to be gained from cheating.

This is a relatively simple and general story of civil war termination. It glosses over the fact that in many civil wars, one or both sides may be fragmented, or that leaders on each side may have disincentives to negotiate peace. These omissions greatly simplify the story, and ultimately only formalization and testing will reveal whether it can produce insight on civil war termination without their inclusion. One final insight has emerged from the civil war termination literature, and that is the potentially critical role of third party intervention or mediation. Whether it is international recognition, alliances, arms supplies, or security guarantees that matter, it is clear that any theory of civil war termination that fails to address external actors will be limited in the normatively interesting implications it can generate. Having said that, it is not clear that consideration of third parties needs to change the general story or the proposed structure of bargaining – it may be that the role of third parties is best captured within the costs and benefits associated with war and negotiation.

1.3 TYPES OF CIVIL WARS

Before proceeding into further detail regarding external actors, it is important to examine the generality of this story. Might there be some civil wars which are fundamentally different from the process described? Some scholars object to the idea of treating civil wars as a single category (e.g. Edmonds 1972). The purpose of this section is twofold. First, it examines the distinctions in civil war most commonly thought to be
impediments to general explanation. Second, in the process of doing so, it attempts to identify a set of factors common to civil wars.

Typologies are generally built on one of two dimensions: motivation and military structure. Some authors argue that civil wars motivated by particular types of issues are fundamentally different with respect to termination. Others argue that particular types of combat require different explanation. This section addresses several motivational distinctions in civil wars and one major military distinction. In the process, it suggests ways in which one might model the issues in civil wars and the process of coercion. I address the following distinctions in turn: ethnicity, territory, greed, and guerilla conflict.

1.3.1 ETHNICITY

A large body of literature on recent civil wars revolves around the concept of ethnic conflict. Ethnic conflict includes both a subset of civil wars and a set of phenomena that cannot be characterized as civil wars, such as massacres or low-level violence. Here I ignore work on low-level ethnic conflict and focus on ethnic civil war. If there is a single proposition on which most scholars of ethnic conflict agree, it is that "historical experience suggests that ethnic conflicts have a peculiarly festering quality. During some periods they are latent, then erupt, only to subside again, and so the cycle continues" (Suhrke and Noble, 1977, 5). Perhaps due to the seemingly intractable nature of these conflicts, an unusually large proportion of work on this form of civil conflict focuses on conflict resolution. I first address the putative causes of ethnic civil war and then turn to how ethnicity affects civil war termination.


Causes of Ethnic Civil War

Ethnic civil war is the result of escalation of ethnic conflict. As such, they reflect competition and conflict between ethnic groups. Licklider (1993) warns that conflict over issues of ethnicity ought to be particularly deep and entrenched. What are these issues over which ethnic groups compete? Some of them are

- Rights of political participation and ability to hold office (Esman 1990).
- Cultural status, especially language rights, which “are often a good indicator of the relative status of an ethnic group and of the competitive opportunities of its members” (Esman 1990).
- Economic opportunities and the allocation of jobs, especially within the military (Esman 1990; Midlarsky 1997).
- Degree of autonomy (Carment and James 1998)
- Future destiny of particular regions (Carment and James 1998)
- Perceived unfairness in the allocation of resources (Carment and James 1998; Lake and Rothchild 1998)

As with other forms of civil war, leadership appears to be an important component of ethnic conflict. Milton Esman (1990) puts forward the argument that:

“Several variable factors affect the ability of ethnic groups to assert their claims convincingly. Among these factors are the resources these groups have available and are able to commit to the common struggle, including their numbers; their geographic distribution – concentrated or dispersed; their organizational, economic, and communications skills; their financial capabilities; and
their prestige within the larger society. Equally important are the abilities, commitment, and coherence of the political entrepreneurs who organize and guide the struggle and the activists or cadres who provide ongoing links with the mass of their ethnic community. The leaders formulate and articulate the agenda that defines the issues and maintains the organization that aggregates and deploys the human and material resources available for the struggle (55).

Carment and James (1998) note the benefits that elites within ethnic groups can derive from playing upon fears of destruction or assimilation. Saidemann (1998) points out that ethnicity provides a dimension on which political entrepreneurs can make proposals benefiting their constituencies. This is not to say that ethnicity is a chimera, however, for as Zahar notes, "Regardless of their root causes, the violence and indiscriminate targeting that characterize internal wars often solidify 'ethnic' identities" (2001, 2). Bosnia's ethnic groups may not have thought of themselves as essentially Serb, Croat, or Muslim before the civil war but they surely did after several years of civil war.

For Lake and Rothchild, the central cause of the escalation of ethnic conflict is the fear a group has about the future, in particular for the physical safety of members. Saidemann (1998) concurs, arguing that when sufficient insecurity for ethnic groups is created, domestic politics begins to resemble international politics, with each group fending for its own defense. Such fear, they argue, creates a series of strategic dilemmas which can lead to escalation of violence, particularly in the absence of any capability for groups to make credible commitments. In short, Lake and Rothchild hold that ethnic conflicts are fundamentally generated when changed circumstances create a security dilemma for groups within a state. In this view, ethnicity creates divisions which increase perceptions of insecurity and therefore magnify the security dilemma and make
it more likely to result in civil war, but the wars themselves need not be fundamentally
different from any other type of war once underway. Fearon (1998) concurs that the
difficulty of making credible commitments is crucial to the escalation of ethnic conflict to
civil war, especially in the former Communist states where ethnic groups suddenly found
themselves without a credible third party to enforce agreements between ethnic groups.

Sambanis (2000a) finds in his statistical analysis of civil war onset from 1960 to 1999
that whereas other types of civil war are driven by economics, issues of political rights
and the presence of ethnic heterogeneity drive ethnic civil wars. Fearon and Laitin
(2000), by contrast, find no relationship between ethnic heterogeneity and the onset of
civil war during the same time period. They find that what appears to be an upsurge in
ethnic civil wars after 1980 is explicable as the product of increasingly favorable
conditions for rural insurgency of any type. They conclude that the ease of forming
insurgent bands, rather than generalized group hatred, explains civil war initiation.

Collier and Hoeffler (2001) offer similar findings, noting that after one controls for other
types of grievances and the ability to finance rebellion, ethnic and religious diversity
actually decrease the incidence of civil war. In short, whether ethnicity is a significant
cause of conflict is itself still an unresolved issue, which should cause researchers to
approach theories of the intractability of ethnic conflict with a skeptical eye.

**Termination of Ethnic Civil Wars**

If ethnicity is to be considered a principal cause of civil war, how should it affect war
termination? There is scant empirical evidence for the notion that ethnic wars are
difficult to end. Mason, Weingarten, and Fett (1999) find that contrary to their expectations, there was no relationship between whether a conflict was fought over ethnicity or ideology and the probability of negotiated settlement. They did, however, find that governments were more likely to win ethnic wars while rebels were more likely to win ideological ones. I address the motivation of the participants, bargaining, and the security dilemma as they apply to ethnic civil wars.

Cooper and Berdal (1993) argue that tensions between ethnic groups stem from unalterable characteristics and are therefore likely to persist longer than other types of political conflict. As noted, most scholars reject this approach and argue that ethnicity is partially constructed and selectively emphasized by leaders. Cooper and Berdal also suggest that whereas most revolutionary civil wars appear to be conducted between rival governments, ethnic civil wars more often involve a loosely organized opposition. In such situations, they posit that the sides may be less likely to accept each others’ legitimacy. In addition, each side may be torn by a struggle between different leaders seeking to establish themselves as representatives of the ethnic groups. In such a situation, even getting to the point of negotiation may be very difficult for the parties. As has been seen, however, this is hardly a situation unique to ethnic wars – and it cuts against the notion that ethnic civil wars are the product of manipulation by leaders.

Horowitz (1990) argues that ethnic conflict is intractable because it resolves around symbolic issues that are largely zero-sum and indivisible. If true, this may pose an obstacle to negotiation. though the lottery technique can be applied in this instance as well. Carment and James (1998) argue that the zero-sum nature of ethnic strife is due to
the fear that it will be resolved only with the destruction or assimilation of one group. They argue that even when there are multiple issues of disagreement, initial military and political gains for a group often determine the extent to which the group gets its way on every issue, possibly for decades to come.

Does ethnicity change the nature of acceptable postwar settlement? Recent scholarship has focused on how to address the security dilemma in ethnic conflicts. Fearon (1998) states:

"If the minority could be guaranteed that the majority would in fact implement (a proposed mutually beneficial agreement), the minority would then prefer not to fight. But the majority cannot credibly commit itself to make such moderate demands... because at that point its bargaining power will have increased due to the consolidation of police and army capabilities” (118, italics in original).

Further developing his argument, he suggests that five factors alter the ability of the majority in an ethnic war to make credible commitments to the minority: military strength of the minority, pattern of settlement of the groups, presence of external guarantors for the minority, extent of decline in future military capabilities of the minority given its assent to an agreement, and the value of secession to the minority.

Some address the security dilemma through political institutions. Zahar (2001) contends that winner-take-all elections can create insecurity when the sides are divided by ethnicity, for they allow the majority group to exclude the minority from governance. McRae (1990) called for research into the applicability of consociationalism as a solution to ethnic conflict. Lijphart (1990) argues that there are a number of ways for power-sharing arrangements to be constructed – distribution of political offices among groups.
group autonomy, proportional representation, and a minority veto. He states that in the long run, "the only solutions to the problems of ethnic division and strife that remain are power-sharing and partition or secession" (493).

Zartman (1998) also argues that ethnicity as an issue changes the nature of an acceptable settlement. He posits that a new polity is required to end an ethnic conflict, because once ethnic groups have been mobilized, the old polity is insufficient to handle the new configuration of relevant political groups. He argues that consociational arrangements are too limited and difficult to apply to succeed as solutions to ethnic wars, for they require each group to have trusted leaders and for each group to believe that the majority will permit minority self-rule and will have incentives to obey the rules of collective bargaining. Waterman (1993) also suggests that a problem with consociationalism as a solution to civil war is that it requires centralized parties with strong leaders that enjoy the autonomy needed to negotiate for the group, conditions that may not be present in many wars. Zahar (2000) suggests that consociational systems may not be capable of bring about a lasting and stable peace, for many of the features of consociationalism can increase ethnic conflict by decreasing its costs. Nor do electoral and institutional dynamics provide security against unilateral defection - to the contrary, some features of the Dayton and Ta`if Accords actually increased insecurity in the early stages of implementation.²⁶

There is another dimensions to the security dilemma in ethnic wars that have led some to reject institutional design as a solution to ethnic civil wars. As noted, Posen
(1993) suggests that ethnicity can provide a mechanism for motivating troops and that motivated forces are an offensive threat to other groups. He also notes that geographic distribution of groups, especially the creation of ethnic “islands” surrounded by other ethnic groups, heightens the risk of conflict. Kaufmann (1996) argues that the most successful solution to ethnic wars is therefore likely to be population transfers to create defensible enclaves for ethnic groups, followed by partition. He holds that other solutions, such as power-sharing, fail to resolve the security dilemma for competing ethnic groups. This reflects an argument by Iklé (1991) that partition can make the stakes in civil wars more divisible. Samanis (2000b) tests “partition theory” as represented by Kaufmann for civil wars fought since 1944 and finds that wars ending in partition are as likely as wars ended by other means to recur, and partitions do no better than other settlements at preventing low-level ethnic conflict after war’s end.

Kaufman (2000), in a response to the arguments of Posen (1993) and Kaufmann (1996), argues that ethnic civil wars are difficult to end because the security dilemma is not in fact the crucial obstacle to peace. Instead, he holds that ethnic conflicts are difficult to end because the mass preferences of ethnic groups are the cause of the security dilemma that precedes civil war and the rise to power of leaders who favor war. In short, symbols of ethnicity are manipulated by potential leaders and create ethnic hostility. Once such hostility exists, leaders are captive to the mass preferences of their groups for war. To end the conflict therefore requires not a third party guarantor, but rather a third party mediator and nongovernmental peace-builders to change the

---

26 The Dayton and Ta’if Accords ended, respectively, the Bosnian and Lebanese civil
underlying preferences of warring ethnic groups. The argument thus ties together the causes and resolution of ethnic conflict. Kaufman’s argument makes use of a number of examples, but it assumes rather than demonstrates that even absent the security dilemma no acceptable bargain would exist between ethnic groups.

Also relevant to the security dilemma in ethnic wars is foreign intervention. Forsberg (1999) suggests that ethnic conflicts should be more likely to draw in international intervention than other types because ethnicity frequently crosses state boundaries, raising the probability of particularly dangerous interstate territorial disputes. Moore and Davis (1998) argue that ethnic ties can create “ethnic alliances” between rebel groups in one state and the governments of that ethnicity in neighboring states.

Conclusions Regarding Ethnicity

After reviewing these arguments about the onset and termination of ethnic civil war, there appears to be no substantive difference between these wars and other civil wars that merits changing the basic story of civil war termination. There is reason to believe that in fact acceptable bargains do exist in many if not most ethnic civil wars. Lake and Rothchild (1998) agree with Fearon (1995, 1998) that there must always be some negotiated agreement which both sides would prefer to continued war. They argue that three factors make such agreements difficult for the sides to accept: incentives to misrepresent private information regarding expectations about war and preferences, the inability of actors to “credibly commit themselves to uphold mutually beneficial wars.
agreements they might reach" (13), and the security dilemma which encourages each side to strike preemptively. These factors are the same ones that exist in other civil wars, and possibly in all wars.

Moreover, it does not appear that ethnic civil wars are disorganized violence caused by intergroup hatred. Dragadze's (1999) analysis of the use of the term "ethnic conflict" to refer to civil wars in the Caucasus finds that these wars can just as readily be understood as "rational" struggles over political power, economic resources, land, and territorial unity. It is competing elites who use the concept of conflict between ethnic groups to mobilize support for their rule, argues Dragadze in an echo of other researchers' findings. She also notes that would-be intervenors such as Russia in the Caucasus have incentives to portray civil wars over other issues as stemming from eternal ethnic grievances, requiring a strong third party to control. Jacquin-Berdal reaches the same conclusion, pointing out the ability of leaders to rearrange and selectively emphasize historical facts to magnify interethnic cleavages and minimize intra-ethnic differences.

Lake and Rothchild (1998) maintain that

"Competition for resources typically lies at the heart of ethnic conflict. Property rights, jobs, scholarships, educational admissions, language rights, government contracts, and development allocations all confer benefits on individuals and groups. Whether finite in supply or not, all such resources are scarce and thus objects of competition and occasionally struggle between individuals and, when organized, groups.... Politics matter because the state controls access to scarce resources and the future income streams that flow from them. Individuals and groups that possess political power can often gain
privileged access to these resources, and thus increase their welfare” (9).

Berdal and Keen (1997) also argue that the resort to violence and reluctance to end ethnic civil wars are often the result of rational analysis of costs and benefits on the part of various actors.

Some have criticized the very notion of ethnic conflict. Marshall (1997) noted, “The term ethnic conflict has become a euphemism for substrate conflicts we cannot explain or comprehend, especially those taking place in “low” cultures….the proverbial rug under which we sweep the dirt and debris of political relations….“ He notes that while ethnic divisions are ubiquitous, the degree to which these distinctions are politicized changes over time.

Although it is the practice of most studies of ethnic civil wars to treat ethnicity and ideology as mutually-exclusive foci of civil wars, there is reason to believe that ethnicity overlaps with other issues, even aside from the distribution of resources. The 1911 National Revolution in China was simultaneously a military rebellion against the monarchy, a revolution of provinces and local gentry against the government’s plan to nationalize railroads, and a racial war between the Han and Manchus (Rummel 1991; Hoyt 1989: Esherick 1976). The 1876 revolt of Colombian Conservatives against the Liberal government would seem by the nature of the parties to be an ideological conflict. yet the trigger for the revolt was government attempts to secularize education and the revolt ended with a string of military victories by Liberals and a simultaneous retreat from the education policy (Bushnell 1993). Is a conflict between Church and secular concerns the same as a conflict between different religions? There is no clear line
dividing ethno-religious rebellions from ideological ones. Because ethnicity and religion are issues that can be incorporated into ideologies.

In general, statistical analyses of civil war termination have found no significant difference between ethnic civil wars and other civil wars regarding type of ending and number of casualties, while studies of ethnicity and war duration have produced mixed results (Licklider 1998). Meek (2000) found no relationship between ethnicity and the duration of wars, regardless of whether they ended via negotiated settlement or military victory by one side.

There are two lessons to be drawn from research on ethnic conflict and civil war. First, despite the plausibility of ethnicity as something different from other types of political divisions, it seems to make little difference to civil war termination. The theoretical reasons to expect such a difference are largely overstated, while empirical analysis has revealed no glaring anomalies. This indicates that despite the tremendous amount of research on ethnic conflict in particular, it can be treated similarly to conflicts over other issues.

Second, the common theme in the rhetoric of ethnic conflict may be symbols and identities, but these seem to map remarkably well onto the continuum of control over resources. This is consistent with suggestions by other scholars of civil wars. Berdal and Keen (1997), for example, argue that violence in most civil wars has the political goal of changing the allocation of resources in society. In addition, as Lake and Rothchild note, some issues that appear purely symbolic on their face, such as language rights, may in fact be important determinants of resource allocation. This notion of resources can surely
be applied to other conflicts – ideological conflicts tend to promote parties or factions which, if they gain power, will then have the ability to control resource allocation.

Certainly territory and economic benefits represent important resources. In short, this explanation for ethnic conflict is appropriate for analyzing other civil wars as well. It is ironic that the ethnic conflict literature has generated greater insight on the nature of civil wars in general than on the purportedly unique features of ethnic wars.

1.3.2 TERRITORY

In contrast to ethnic conflicts, many scholars have argued that territorial civil wars (i.e. secessionist or separatist revolts) should be easier to end than others. For geographic separation should minimize the security dilemma and territory is clearly a divisible stake (Heraclides 1997; Licklider 1993). Russell (1974) notes that separatists don’t seek the overthrow of the regime and therefore should not generate the same level of insecurity for the government. Heraclides found that military victory occurs in less than one-third of separatist struggles: the government wins 21% of the time, the rebels win 10% of the time, and autonomy is granted 29% of the time. The remainder of wars end with ambiguous outcomes such as stalemate, capitulations of questionable sincerity, intermittent fighting, or ongoing war. According to Heraclides, separatist movements often fight against long odds because the alternatives to war are even worse – he argues that a more equitable distribution of resources and some form of power-sharing through autonomy are the most likely measures to end a separatist struggle. This analysis
suggests that secessionist civil wars ought to fit well within the story of civil wars driven by competition over the allocation of resources outlined by ethnic conflict researchers.

Mason, Weingarten, and Fett (1999) hypothesized that secessionist wars should be more prone to negotiated settlement than revolutionary wars. Their results, however, found that secessionist wars were actually less likely to be negotiated than revolutionary ones. Moreover, governments were more likely to defeat the rebels in secessionist wars. This finding is consistent with results from earlier statistical work on civil war termination (Licklider 1998). Meek (2000) found no relationship between separatism and civil war duration, again regardless of whether wars ended via negotiated settlement or military victory by one side.

Many authors appear to be confusing territorial divisions between groups, separatism, and secessionism. When in 1835 Bento Gonçalves led the Farrapos of Brazil's Rio Grande do Sul province in revolt, the demand of the rebels was not independence or separation but rather autonomy within Brazil (Calogerás 1939). In an example of a territorial conflict over ideology rather than secession, Chinese rebels led by Sun Yat-Sen objected to China's 1917 declaration of war on Germany, and demanded the return of the former President to office (Clubb 1972). They supported the power of Parliament over that of the Premier (MacNair 1968). This was without a doubt an ideological struggle between two sets of elites. However, it quickly became the case that Parliamentarians fled to the South while the southern provinces joined the Yunnan rebels. The war thus became both a revolution and a regional war of North against South.
Not only does there not appear to be any support for the proposal that separatist conflicts are uniquely susceptible to negotiation, but separatism itself is not necessarily distinct from other types of civil war issues. For example, the TPLF in the Ethiopian civil war began as a separatist organization but quickly abandoned Tigrean separatism as it neared victory over the central government, opting instead to take its place and dominate Ethiopian politics (Heraclides 1997). This strongly supports the resource competition view of civil wars, as does Rupesinghe and Anderlini's (1998) description of land and water scarcity as motives for ethnic conflict in Rwanda and Israel, respectively. If territorial issues can become revolutionary issues and can spawn or intensify ethnic conflict, then it makes little sense to treat secessionist civil wars differently.

1.3.3 GREED

Aristotle once said, "all wars are a species of acquisitive activity" (quoted in Coker 1997, 627). A number of authors argue that a particular type of civil war, normally held to be a modern phenomenon, is the civil war of greed. Mitchell (1980) warned that material rewards for participants in civil wars can increase the attractiveness of conflict. An although Imai and Weinstein (2000) joined others in finding that civil wars substantially slow economic growth, a recent spate of research on greed in civil wars suggests that economic motives can generate perverse incentives for war: this phenomenon is particularly evident in states which are natural resource-dependent and where those natural resources are controlled by the rebels (Collier 1999, 2000: Collier

27 It should be noted that their logic focuses more on the dangers of ideological
and Hoeffer 2001). Berdal and Keen (1997) note that arms can provide economic
benefits to the participants in a civil war by allowing control over economic resources, in
addition to their security and psychological benefits, while Keen (1998) notes that the
absence of domestic authority can create economic benefits for some groups even as it
diminishes overall economic performance. Finally, Collier and Hoeffer (2001) find that a
greed-based model of civil war, in which wars are caused by the ability to finance them,
substantially outperforms a grievance-based model, in which wars are caused by ethnic or
religious differences, political repression, or economic inequality.

There are concrete examples of this phenomenon in Liberia and Sierra Leone. Coker
cites the existence of a "parallel economy" in Liberia's civil wars, while Berdal and Keen
argue that the initial incursion by RUF from Liberia into Sierra Leone was motivated by a
dispute over how to divide the spoils from Liberia's civil war. Indeed, the conflict in
Sierra Leone centered around that country's mineral-producing regions. Once the RUF
captured these areas, they were able to purchase arms and became dramatically more
threatening to the government (Shearer 1997).

There seems to be some support for the notion that economic motives can provide
perverse incentives for civil war. As Collier (1999) notes, when one group does well out
of war while the rest of society suffers, that group will be less likely to make concessions
to gain peace, while other groups will be more likely to make concessions to gain peace.
Part of his argument, however, rests on the notion that rebels are uniquely likely to lose
their monopolies in the postwar setting, because they will have to disarm. In the event of

revolutionary wars than on the ease with which secessionist wars can be negotiated.
military integration or retention of the rebels' army as the state's new regular armed forces, however, this may not be the case. The security dilemma is not as one-sided as Collier suggests. Berdal and Keen suggest that both parties may actually prefer war to peace if peace threatens their ability to engage in the same level of resource exploitation. They warn that economic motives may increase the difficulty of demobilization and hence intensify the security dilemma, because elites may resist losing the ability to take what they want through force.

Collier and Hoeffler (1998) and Collier, Hoeffler and Söderbom (1998) raise another interesting implication of the economic explanation for civil wars. If civil wars provide an opportunity for rebels to monopolize some economic resources, this opportunity, and hence the rewards of rebellion, should decrease as the number of rebel groups increases. Therefore, they conclude that societies divided between two ethnic groups should suffer more and longer civil wars than societies with many groups or with only one group. Their empirical results largely support this conclusion.

Another mechanism by which economic factors may influence civil war termination is suggested by Zahar (2001), who notes that in weak states, resources tend to be concentrated in the state. Moreover, the prospect of postwar assistance increases this concentration, making access to political power all the more important for groups even when a civil war was fought over ethnicity rather than desire for loot. Coker (1997) suggests that alternative economic structures may actually increase the chances for peace, since they create interests in stable commerce. However, Zahar points out that while peace may pay economic dividends, if these dividends are delayed then intransigent
leaders may calculate that the short-run benefits of fighting, particularly economic benefits from the war economy, outweigh the long-run benefits of peace.

This literature has established that some civil wars are characterized by profit-seeking behavior, which is certainly consistent with the abstract story of resource competition. The argument that profits of war are preferred to peace, however, presumes a particular type of peace agreement. In theory, there is no reason that the sides in a civil war cannot simply codify the existing degree of control over resources and stop shooting each other. After all, resources are generally divisible and the state can enforce monopolies. While this recent body of work has generated an important insight about motivation, it has largely ignored prior work on war termination in favor of focus on a few prominent examples of agreements terminating greed-based civil wars. If alternatives to those agreements are possible, there is no need to modify the story of civil war termination to take into account these wars.

1.3.4 GUERRILLA WAR AND COUNTER-INSURGENCY

A final objection to approaching civil wars with a single theory draws upon a military distinction. Guerilla wars are said to be fundamentally different than conventional wars. That is, occupying territory to reduce the opponent's ability to extract resources may not be possible. Thus, inflicting costs, making offers and receiving an authoritative answer to them may not even be possible in many guerilla wars.

Many trace the origins of systematic analysis of guerilla war to Col. C.E. Callwell's manual on "small wars" for the British Army, first issued more than a century ago.
Callwell defined small wars as "all campaigns other than those where both the opposing sides consist of regular troops" (1906, 21). While his examples are largely drawn from colonial wars, he elucidates a number of distinctions between conventional and guerilla operations that persist to this day. A conventional army fighting a guerilla opponent faces:

- Highly disciplined but badly armed opponents. Fearon and Laitin argue that "the fundamental fact about insurgency is that insurgents are weak relative to the governments they are fighting, at least at the start of operations" (2000, 7). Rice (1988) concurs, arguing that asymmetry in capabilities is strongest in guerilla wars.

- Little or no organization on the opposing side

- Difficulty in establishing a clear and definite military objective to force surrender

- The need to punish supporters of the insurgents: in this case "the war assumes an aspect which may shock the humanitarian" (40). Models of insurgency typically examine the incentives for the individual guerilla or supporter and feature what Fearon and Laitin (2000) call a "tipping dynamic" in which costs for individual guerillas start to exceed benefits and they cease fighting, irrespective of the bargaining position of their leaders. 28

- The need to destroy the logistical base of the guerillas, which is likely to be the logistical base of civilian life as well. Callwell argued that small wars are "campaigns against nature," that is, logistics play an unusually large role for both sides and casualties stem more from the fact of guerilla war than the numerical strength of
one’s opponent. He also noted the great difficulty for the guerillas in a small war of shifting to conventional war – using the example of Shamy’s failed rebellion against Russia, he points out that the capture of heavy weapons by the rebels was their undoing, for it drastically reduced their mobility and tied them to supply trains and fixed bases.

- Uncertainty as to the extent of popular support for the guerillas. Legitimacy has long been recognized as imperative for the successful guerilla (Blaufarb and Tanham 1989)

Of course, Callwell omits some features of guerilla insurgency that play a prominent role in modern analysis. Mao’s strategy of guerilla warfare emphasized the eventual necessity of a shift from guerilla to conventional operations: this is the approach taken by many writers on the subject (e.g. Blaufarb and Tanham). Rice (1988) argued that guerillas tend to shift to conventional war when the overall balance of military power moves in their direction.

What effect could these differences have on modeling civil war termination? First, as Calwell noted, disease plays a much more prominent role in guerilla wars. It may be the case that the regular army takes casualties in guerilla wars that are not only a function of its opponent’s strength but also of its own, as a certain percentage of soldiers fall ill, for example.29 This suggests that an important criterion for modeling expectations about the war process is remaining as general as possible with respect to how costs of fighting

28 Though not limited to guerilla war. Lichbach’s (1995) model of rebellion fits this description.
29 Disease was also a major killer in interstate wars prior to World War II (Dupuy 1990).
might accrue. Given the dismal predictive record of most mathematical models of casualties, it may be best to simply ask whether they are expected to be high or low, increasing or decreasing.

Second, a guerilla rebellion may be diffuse, with guerillas operating in different regions of the country or dispersed in a single large region. If this is the case, there may be no clearly defined leadership, especially in cases where the resistance has a structure of independent cells. However, while political violence and low-level rebellion may be disorganized, civil war requires infliction of substantial numbers of casualties. This requires some combat. Individuals taking the law into their own hands may produce riots, assassinations and crime, but sustained combat operations requires logistical support and funding; it is necessarily an organized enterprise. It makes as much sense for rebels to have leaders as it does for a state to have leaders. Finally, Rice (1988) suggests that as guerilla movements become more radical, that is, as their demands for change become larger, they become more organized because they move farther away from a base of spontaneous support.10

Moreover, many studies of guerrilla warfare find that it is essential for the rebels to hold some piece of territory so that they have a base of operations: in addition, because rebels are typically outnumbered at the beginning of a civil war, they require leadership capable of quickly concentrating forces on a single target to achieve temporary superiority and then quickly dispersing before government reinforcements arrive. Some method of intelligence-gathering is also essential to the ability of guerillas to fight:
again, this requires some leadership, even if the guerillas operate in a decentralized cell structure (Rice 1988; Wilkinson 1975; Joes 1992).

The difficulty of distinguishing between guerilla war and conventional war, the fact that logistics are not unique to guerilla wars, the need for guerillas to have some degree of organization in order to sustain the level of combat required for civil war, and the fact that guerillas still do better (and in fact switch to conventional tactics) as they get stronger relative to the government suggest that no structural change is needed to deal with these types of wars. However, the differences between conventional and guerilla war when it comes to how costs are inflicted and suffered provide a reason to refrain from detailing the relationship between force strength and casualties in models of the civil war process. Examining this category of wars therefore clarifies the requirements for building a general model of civil war termination.

1.3.5 TYPES OF CIVIL WAR AND GENERAL THEORY

This review of some of the most often proposed theoretical distinctions between civil wars finds little reason to expect that increasing the complexity of my story by including civil war types will be rewarded with increased predictive power. Many authors have a favorite category of civil war, and seem to assume a clear distinction between their type of war and everything else. The categories suggested are not mutually exclusive, although they are often treated as such.

30 One might think of this as an application of the median voter theorem to guerilla recruitment and logistics.
Moreover, they aren’t particularly exhaustive, either. Many civil wars don’t seem to fit neatly into any of these categories. The Pai-Ling rebellion in China was mildly politicized and was also a case of a bandit army that simply got large enough to engage in real combat against government forces (Friedman 1974). The Druze of the Ottoman Empire rebelled in 1896 not because of hatred for the Turks but because the government made them subject to conscription. The government defeated the Druze, but found their villages to be abandoned. Unable to locate the Druze at an acceptable cost, it abandoned its plans for their conscription (Betts 1988). Other civil wars resemble peasant revolts more than anything: Rumania 1907 (Fotino and Iordache 1991), Bulgaria’s Agrarian Rising (Swire 1939), and the 1905 revolution in Russia (Goldstein 1983). Nor are tactics fixed: Darul Islam rebels suffered heavy casualties in pitched battles over territory in 1950, then switched to guerilla tactics (Jackson 1980).

Indeed, examining these types of civil war has revealed more similarities than differences, and the frequency with which wars cross these boundaries militates against treating them as entirely separate phenomena. Particularly prominent in explanations of each type of war is the role of resources. The competition over the allocation of resources is common to most if not all civil wars, while the dependence of the military balance upon the resource balance exists in both guerilla and conventional wars. This suggests a more detailed but no less general story of civil war termination.

---

31 The Chinese government did not defeat the Pai-Ling forces in battle, but won the 1914 war anyway when the rebel army ran short of supplies. The semi-bandit Pai-Ling forces
1.4 A GENERAL STORY OF CIVIL WAR TERMINATION

Analysis of existing work on war termination, the putative differences between civil and interstate wars, and suggested typologies of civil war has suggested a general story of how civil wars end. Civil wars are contests over resource allocation fought between a government and a coalition of rebels. Because both sides are rational and anticipate future resources, what is really at stake is control over the allocation of the future stream of resources produced in a state.

Civil wars are waged by organizations. For extended combat requires some degree of planning and resource distribution that necessitates organization. Studies of insurgency and rebellion, whatever their methodological orientation, have long recognized that combat operations require training, personnel, logistical support, and weapons. This conclusion has been reached by those studying peasant revolutions (e.g. Ramsey 1969), revolutionary civil war (Wilkinson 1975), and guerilla insurgency (Rice 1988). Even absent the need to cope with the vicissitudes of combat, organization would be necessary. While a government is organized to some degree by definition, a rebel movement must also be organized. For some method of providing selective incentives to those who fight the government is necessary to overcome the collective action problem of rebellion (Lichbach 1995). Gurr’s (1993) analysis of minority groups and violence finds that the ability of groups to rebel is contingent on their ability to mobilize, defined as “the extent to which group members are prepared to commit their energies and resources to collective action on behalf of their common interests”(127). He argues that mobilization saw that strong government armies protected potential targets and simply split up into
is impeded when contending organizations seek the support of a disaffected minority and enhanced when leaders of those organizations can form coalitions capable of making political decisions. In a similar vein, Tilly. Tilly and Tilly (1975) note that organization is crucial to collective action, which in turn is necessary for collective violence and rebellion. Goldstone (1991) argues that even in the ideological realm of revolutionary struggle, organization is necessary, noting that “To dominate a revolution, an ideology needs a well-organized carrier able to interpret that ideology for a mass audience” (45), and “Groups that are better organized than their rivals have an advantage in taking a leading role in governance immediately after a revolution” (46). In sum, assuming the combatants in a civil war have some minimal level of organization is both reasonable and widely supported in the literature.

Given two organized actors, civil war becomes not only a process of coercion but also an opportunity for bargaining. Thus there are two ways that a civil war may end: through military defeat for one side or through a bargain. The expected chances of military defeat and costs of fighting are determined by the process of military action in civil wars. The possibility of a “fight to the finish” provides each side with incentives to bargain. Bargaining occurs if the government makes an offer to the rebels. It will make such an offer, and the rebels will accept it, only if doing so promises greater rewards or fewer costs than continuing the war. While part of those costs and benefits are specified in the offer itself, part of them also depends upon the likelihood that each party will cheat on an agreement. Incentives to renege on the terms of an agreement may depend on the nature
of combat, the provisions or guarantees in the agreement, the costs of war, or the military advantage to be gained from cheating.

This depiction of civil war termination is grounded in war termination theories and modified to fit the peculiar characteristics of civil wars. This is still a theoretically-informed story, too vague to be termed a theory. Chapter 2 begins with this story and proceeds to detail it verbally and mathematically so that expectations about manipulation of a civil war's characteristics may be derived. It is these expectations that in turn generate normatively interesting propositions about what outsiders can do to alter the course of a civil war.
Chapter 2

A THEORY OF CIVIL WAR TERMINATION

Prior work has examined the role of military considerations, bargaining over the distribution of resources, and the security dilemma in civil wars. However, no theory includes all three of these components: coercion, bargaining, and expectations about postwar behavior. Furthermore, existing bargaining models of civil war termination assume symmetry between the government and rebels. In this chapter, I construct a theory of civil war termination that integrates these important factors into an explanation of the decision to terminate a civil war. Before outlining the formal model, I begin with a description of the theory.

2.1 THE PROCESS OF CIVIL WAR TERMINATION

Civil wars are essentially dyadic contests between the government and the rebels over the authoritative allocation of the stream of resources produced within a state’s borders. That is, they are not fought over some fixed “pot of gold” – i.e. positions of power or territory – but rather over the resources these things provide year after year. Political power provides partial control over the allocation of the resources produced by a state’s subjects every year. Territory provides complete control over some portion of the state’s resources. In either case, it is the prospect of some period of control over the stream of resources produced that is assumed to provide the incentive to fight. This theory thus views factors such as ideology or ethnicity as tools that leaders use to mobilize followers
or delineate terms of settlement. After all, an organization that wants to gain power in order to implement an ideological program may well behave just like an organization that wants to gain power in order to allocate resources to its supporters.

An example of this process is the Darul Islam rebellion in Indonesia. The Darul Islam movement in Indonesia rebelled against the government because it wanted a Muslim state. There is every reason to believe that followers of this movement were sincere in their religious convictions. However, to non-Muslims or secular politicians, it posed the same threat as any other rebel movement – it sought to monopolize the authoritative allocation of resources in its hands. Specifically, its proposed Constitution of the Indonesian Islamic State provided that “all offices and positions of importance and responsibility in the civil and military administration” were to be reserved for Muslims: the practical effect of this provision would be to exclude secular nationalists like Sukarno (Jackson 1980, 4). I do not deny the power of religion, ethnicity, or ideology. I argue that civil wars end as if both sides were out for resources, regardless of their “true” intentions.

---

32 The Federal War in Venezuela was initiated by a group of generals that termed themselves Federalists in order to rally support, though the phrase had nothing to do with their own reasons for fighting: “They were ready now, the... generals and their civilian allies. All they needed was a cause. Antonio Leocadio Guzman, a practiced causemaker, reached into the air and produced a slogan. Federation was the motto over which thousands of Venezuelans would die. Boasted Antonio Leocadio Guzman to Congress in 1867, ‘I do not know where the people of Venezuela got their love for the Federation when they do not even know what this word means; this idea came from myself and others who said to ourselves, since the revolution need a slogan, and the Constitutional Congress of Valencia did not care to baptize the constitution (of 1859) with the name of Federal, let us invoke that idea: for if our opponents had said Federation we would have said Centralism’” (Marsland and Marsland 1954, 194).
At stake in a civil war is control over resource allocation. This being the case, the rebels win the war if they gain control over the authoritative allocation of resources, the government wins if it achieves control over the authoritative allocation of resources, and any agreement to divide control over resource allocation is a compromise. During a civil war, each side exercises control over resource allocation in proportion to its relative military power – they each control what they can take through armed force. In turn, the share of resource production controlled by a side supports its armed forces. As the military balance shifts through the process of combat, the share of resources controlled by each side shifts in the same manner -- conquest pays.

I assume that the government is organized enough to make offers and the rebels are organized enough to accept an offer or continue fighting. Furthermore, I assume that civil wars progress as if it were the case that each side was a unitary, risk-neutral expected utility maximizer. A government has the opportunity to offer a settlement to the rebels or to unilaterally choose continued war. If it chooses negotiation, the rebels have the opportunity to accept or reject. That being the case, a civil war will end in compromise if and only if each side expects greater utility from a compromise than from continued war; a civil war will end militarily if and only if no compromise has greater expected utility for both sides than continued war. If multiple bargains offer both sides greater expected utility than war, then the bargain reached will be that which is closest to government control. Governments can therefore prevent revolutionary success in civil wars by offering the rebels just enough to balance what the rebels expect to gain in war.
The expected utility of continued war is determined by each side's expectation regarding the outcome of a fight to the finish. As the military balance shifts toward a side, that side becomes more likely to win the civil war given a fight to the finish. Both sides estimate the future military balance and the future costs they will suffer from their knowledge about the current military balance and the current costs they suffer. Therefore, war becomes more attractive as a side gets stronger and less attractive as it gets weaker, relative to its opponent.

The expected utility of making or accepting an offer is determined by the division of control over resource allocation specified in that agreement – if both sides know the other will honor its commitments. The primary commitment of concern is demobilization. A negotiated agreement calls for some kind of mutual disarmament, integration, or the construction of an entirely new armed force. This means that each side can cheat by hiding arms, lying about the number of personnel under its command, passing its combat veterans as neutral, green recruits, or otherwise sabotaging the disarmament and reintegration process in its favor. Therefore, if one or both sides renege on their commitments, the war resumes after the failed implementation phase of the agreement.

---

33 Fights to the finish do sometimes occur in civil wars. One example is the Canudos war in Brazil, which ended with the complete destruction of the rebels: “On October 5, 1897, the last smoking huts were finally taken. Not a sound, not a cry was to be heard, nor any sign of life to be seen. ... The government troops found no one alive to take prisoner... If any wounded fighters remained alive, they died in the fire that was set by some of the victors, who thought thereby to wipe out the stain of Canudos forever” (Bello 1966. 155).

34 If the agreement calls for only one side to disarm, the other has an incentive to simply attack after its opponent is defenseless and take everything. Few would call such a bargain a negotiated agreement at all, whatever its other provisions might say.
Examples of failed settlements in civil wars are legion. Take, for example, the “Second Round” of the Greek Civil War. This war was ended by the Varkiza Agreement of February 1945, which provided for partial amnesty, disarmament of rebel forces, and free elections. The agreement was violated by both sides – pro-government militias hunted down former rebels while the rebels retained many of their arms. Fighting between rebel guerillas and pro-government paramilitaries erupted in late 1946, and the “Third Round” of the war was soon under way (Nachmani 1990; Close 1995). Assuming both sides balk at implementation as in this example, the result is a pause in the fighting, after which the war picks up exactly as the parties left it.

If one side reneges but the other abides by the terms of the agreement, the result is a resumption of war but with a twist – the party that reneged on implementation still has its full complement of troops while the other party has partially or completely disarmed. As Walter describes the situation,

"...creative implementation strategies do not change the end result. In civil wars, demobilization can be postponed. It can be implemented incrementally and in a reciprocal fashion, but it cannot be avoided. And as long as both sides know this, a crafty opponent need only wait until full disengagement to strike" (1999, 45).

Therefore, the war after the failed implementation phase will favor the unilateral defector and disadvantage the party that complied with the agreement when compared to the expected course of military events had there been no agreement at all. Naturally, a side’s expected utility is higher for an agreement if it expects its opponent to honor the agreement than if it expects its opponent to renge on its commitments.
These expectations regarding the opponent's behavior stem from knowledge of the opponent's incentives. If an agreement is particularly vulnerable to exploitation, that means that if one side reneges on its commitments while the other honors its commitments, the result will be a large shift in the balance of military capabilities to the advantage of the untrustworthy side. If an agreement is less vulnerable to exploitation, the result of this situation would be a much more modest shift in the balance of capabilities, perhaps one that barely registers to the combatants. It should be obvious that we would expect compromise to the very difficult if an agreement is extremely vulnerable to exploitation and at least somewhat easier if both sides know that exploitation doesn't pay.

In the first Sudanese civil war, the Anya Nya rebels fought government forces for years and eventually succeeded in convincing the government to open negotiations. Over time, the offer the rebels faced was that Anya Nya's stronghold in the South would become a number of states in a new Sudanese federation, enjoying substantial autonomy. Southerners would be represented in the new government and receive a number of important posts. Most importantly, demobilized Anya Nya fighters would, together with demobilized government troops, form the nucleus of a new army. The agreement went so far as to specify the percent of officer positions at each grade that would be filled with fighters from each side. In short, the rebels would receive control over the allocation of a large fraction of the resources produced within Sudan (Assefa 1987).

While the offer was tempting to the rebels, for the civil war had devastated the South and killed many Anya Nya fighters, they worried that once they had demobilized, the
government would renege on its promises to integrate military forces and transfer substantial political authority to the South – government forces were better armed and former Anya Nya fighters in Northern garrisons might be easily overpowered by local militias or destroyed with hidden caches of government arms. What finally prompted Anya Nya to sign the agreement was mediation by the Ethiopian government, which offered to guarantee the security of the rebels in the transition period. As Ethiopia had assisted the rebels from time to time, this promise was credible (Assefa 1987).

In terms of the theory, when the vulnerability of the agreement to exploitation decreased, the incentives for the government to renege on its commitments were also reduced, for it might face intervention by a foreign power in a new war. At this point, the rebels could expect the Sudanese government to honor the agreement, given their knowledge of its incentives to do so. The agreement was signed and successfully implemented: Sudan experienced eight years of peace until the outbreak of its next civil war (following the abrogation of the 1972 agreement by the government).

2.2 THE CIVIL WAR TERMINATION GAME

I model the structure of civil war using game theory. Games have players, strategies, structure, outcomes, and payoffs associated with each outcome. The players are of course the government and the rebels. In the remainder of this section, I outline the strategies available to each player, the structure that connects strategy choices to outcomes, the meaning of each outcome, and the meaning of each outcome. The final section will address the payoff associated with each outcome.
2.2.1 STRATEGIES

The government and rebels bargain over the future distribution of control over resources. The two sides’ positions on the distribution of control can be represented by a scale from zero to one. At zero lies the rebel side, which desires complete control over all resources produced, and therefore wishes the government to control nothing at all. At one lies the government side, which wishes the rebels to control nothing and itself to control everything. An Offer of .99, then, is a government proposal to give the rebels control over 1% of the stream of resources produced within the state. Perhaps this is to be accomplished through autonomy for a small region the rebels control, or through elections so stacked that both sides believe the government is exactly 99 times as likely to be elected as the rebels. There are any number of potential mechanisms for implementing an offer. Phrased differently, an offer of .99 is saying to the rebels, “Our side gets control over the allocation of 99% of all resources produced each time period in the future and your side gets control over the allocation of the remaining 1%.” Such an offer sounds ridiculous, but perhaps a rebel army that felt it was about to lose would accept the proposal. The government may even choose to offer zero (its own surrender) or one (a simple demand for rebel surrender). The bargaining game is therefore a simple matter of making and evaluating offers from one to zero.

Of course, there is more to ending a civil war than finding some deal that both sides believe would be better than war if successfully implemented. While Walter (1997, 1999) describes the security dilemma as analogous to a prisoner’s dilemma, I model it more
generally as a subgame in which each player simultaneously chooses whether to cooperate or defect. The strategy choices available to the government are, for every number from 0 to 1 inclusive, whether to offer that to the rebels and whether to defect or cooperate. The rebels' strategic choices are, for every number between 0 and 1, whether to accept the government offer and whether to defect or. Therefore, each side can choose whether to cooperate in the postwar world by abiding by the terms of agreement or to defect by reneging on its commitment.

2.2.2 STRUCTURE

Given the choices available to each side – whether to agree to divide resources or continue to fight, and whether to cooperate or defect – the structure of the game determines what outcomes will result from these choices. Figure 2.1 depicts the structure of the Civil War Termination Game (hereafter abbreviated CWTG). While the logic of the compliance subgame that follows rebel acceptance of an offer stems from work on the security dilemma in civil wars (primarily Walter 1997 and Stedman 1996), the overall structure of the game most closely resembles the international cooperation game of Leeds (1998), in which the players move first through a bargaining phase and then through a

---

35 It might seem unnecessary to model the possibility of defection from a proposal for unconditional surrender. However, the idea that defection risks exist even in extreme cases is not absurd. Last year, when Kurdish rebels fighting Turkey attempted to surrender as instructed by leader Abdullah Ocalan, the Turkish Army fired at them. The Turkish general staff issued a statement rejecting a rebel surrender: "The terrorist delegation planning a symbolic surrender to the Turkish state is ... part of (Ocalan's) propaganda.... The terrorist organization has always used such tactics to gain time and then redouble its attacks. For this reason, the Turkish armed forces are determined to
compliance phase, with beliefs about whether an actor will cheat affecting one's own
decision to accept a bargain in the first place. The reader should note that despite the
verbal discussion of changes over time in civil wars, the game itself is not a repeated
game – expectations about the future are incorporated into the payoffs for each player,
not the structure of the game.

Figure 2.1 The Civil War Termination Game

At the first node of this game, the government (G) may choose to make an Offer.
Again, zero represents complete rebel control and one represents complete government
control. If the government can do at least as well by making an offer as by refusing to
bargain, then it makes an offer, if only to demand the rebels' surrender. The rebels (R)
have the choice to accept or decline this offer. If they accept, then the bargain is sealed

continue the battle until the last terrorist has been neutralized” (Agence France-Presse.
September 28, 1999). The postwar security dilemma exists even in such extreme cases.
and the actors move into the postwar subgame. They accept if they can do at least as well by accepting the offer as they can from rejecting it. If the rebels decline the offer, the war continues. If an offer has been made by the government and accepted by the rebels, each side is then faced with the choice of whether to cooperate or defect. Since neither side knows whether its opponent will cooperate or defect, there is imperfect information in this subgame - both sides know each others' preferences among outcomes, but neither side can condition its own choice on that of its opponent.

When both sides cooperate (abide by the terms of the agreement), peace is secured and each side receives its agreed-upon share of control over resources in perpetuity. Since defection means retaining one's absolute level of capabilities and restarting the war to take advantage of one's opponent, the result of mutual defection is one period's respite from fighting followed by a resumption of the war where it left off. However, when defection is not mutual, the side that retains its capabilities (defects) will have a military advantage relative to the pre-agreement period. In this situation, the one period of respite is followed by renewed fighting, with the defector having a better chance of winning the war that it would have absent the agreement and its opponent's cooperation.

2.2.3 OUTCOMES

The subscripted letter following FIGHT indicate whether war continues because the government does not make an offer or because the rebels refused its offer; those following NEGOCIATE indicate first the government's choice between defection (D) and
cooperation (C), and second that of the rebels. Table 2.1 summarizes these outcomes: I will address each in turn.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Theoretical meaning</th>
<th>Consequences for participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIGHT(_C) or FIGHT(_R)</td>
<td>No agreement</td>
<td>Continued war</td>
</tr>
<tr>
<td>NEGO(_CC)</td>
<td>Agreement implemented</td>
<td>War ends: shared control over resource allocation results</td>
</tr>
<tr>
<td>NEGO(_CD)</td>
<td>Rebels renege on agreement</td>
<td>Pause in fighting followed by surprise rebel offensive</td>
</tr>
<tr>
<td>NEGO(_DC)</td>
<td>Government reneges on agreement</td>
<td>Pause in fighting followed by surprise government offensive</td>
</tr>
<tr>
<td>NEGO(_DD)</td>
<td>Both players renege on agreement</td>
<td>Pause in fighting followed by resumption of hostilities</td>
</tr>
</tbody>
</table>

The two outcomes FIGHT\(_C\) and FIGHT\(_R\) are structurally distinct but that difference is substantively uninteresting, because the government’s proposal power in the CWTG is simply an abstraction that models a set of government bargaining advantages. Hereafter I refer to them jointly as FIGHT, the outcome produced by the decision of either side to continue the war.
I begin by comparing the extreme cases – true compromise and continuous fighting. The most straightforward of the outcomes is NEGO_{cc}, the result of agreement followed by mutual cooperation. Each side receives the share of resources assigned by the agreement in perpetuity, so in terms of the zero-to-one offer made by the government, it gets control over the allocation of

$$\sum_{i=0}^{\infty} Offer \cdot ResourcesProduced,$$

while the rebels get control over the allocation of

$$\sum_{i=0}^{\infty} (1 - Offer) \cdot ResourcesProduced,$$

For the sake of tractability, I make two assumptions regarding future resource production. First, I assume that expected growth rates don't matter very much to the participants in a civil war, so I treat the amount of resources produced within a state's borders as a constant, so that ResourcesProduced_{t} = ResourcesProduced_{t-1}. Second, I set this constant equal to one, so that the above terms reduce to

$$\sum_{t=0}^{\infty} Offer$$

for the government and
\[
\sum_{i=0}^{n} (1 - O_{\text{ffer}})
\]

for the rebels.

What might such an agreement look like? There are several ways in which control might be divided. First, the two sides might divide governmental authority between political organs that each controls. For example, a number of 19th century rebellions in Latin America were resolved when the Liberals and Conservatives agreed to divide power between a legislature controlled by one party and an executive controlled by the other. Another example of this is the concept of federalism, which in light of this view of civil wars functions as a mechanism to provide local control over the allocation of resources at the local level. Such agreements would involve a degree of autonomy and self-governance for a region controlled by one party to the war, as in the Sudanese case. A second method of dividing the authoritative allocation of resources is a lottery between the sides. It may seem implausible that the sides in a civil war would resolve matters with the childhood solution of "let's flip for it." However, seen in light of the assumption that control over resources is the fundamental issue at stake in civil wars, a real-world mechanism to do just that emerges. Elections generally involve something less than certainty regarding their outcome: surprise upsets are not unknown in post-war elections. An agreement to settle the issue through election can thus serve as a mechanism to divide the seemingly indivisible by a lottery – a process that involves some risk that each side will in the end gain control over resource allocation.

Other arrangements may be possible: the Liberals and Conservatives of Colombia resolved an eight-year civil war in 1957 by agreeing to take turns at the Presidency every
four years for the next 16 years. The agreement ended that war and was honored by both
sides (Clodfelter 1991). The CWTG outcome of NEGOCC encompasses all of these
potential solutions.

In the other FIGHT outcome of the game, however, war is the end result. In this
outcome control over the allocation of resources is determined by coercion. The winner
of the war gets to control the allocation of resources afterward, and during the war each
side controls only the resources it can keep by force. Because I conceive of war as
coercion, I assume that the share of resources a player controls during a war is
proportional to the share of coercive power (i.e., military force) that it possesses. Given
this, a player's total resources over the course of the war can be summarized as

\[ \sum_{t=0}^{w} q_t \]

where \( q_t \) represents that player's share of military capability during each time period and
\( w \) represents the termination date of the war. Of course, the war ends with a winner or a
loser. If a player loses, it will receive nothing more than those resources it gained during
the course of the war, and so the above formula adequately summarizes the resources it
gets.\(^{36}\)

\(^{36}\) Fearon (1998) raises the possibility that an asymmetry exists between the government
and rebels with regard to the payoffs for losing a secessionist conflict. He argues that if
the rebels lose, they receive nothing, but if the government loses, it still recieves the
resources of what's left of the country. I am intrigued by this distinction but reject it in
this model for three reasons: the desire to make the model as general as possible, the fact
that a frequent result of successful secessions is either the outright overthrow of the
government by the rebels (as in Ethiopia) or the ouster of the government by its erstwhile
supporters, and the difficulty of assuming that there is a single "true" motive of a rebel
group in a civil war with regard to secession or revolution, especially if multiple groups
with different goals fight together against the government.
However, if it wins it controls all future resources and so controls

\[ \sum_{i=0}^{n} q_i + \sum_{i=n+1}^{\infty} 1 \]

Military action is not an exact science: a player seldom knows with certainty what the eventual outcome of the war will be. Hence, the players cannot be certain when the war will end. If they are able to estimate the probability that they will win or lose, however, they do not need to estimate \( w \) at all. The resources they control can therefore be summarized as

\[ \sum_{i=0}^{n} [ P(Wins) \cdot 1 + P(Loses) \cdot 0 - (1 - P(Wins) - P(Loses)) \cdot q_i ] \]

If \( P(Wins) \) varies over the course of a war – perhaps becoming larger as a player gains a military advantage – then \( P(Wins) \) should be substituted for \( P(Wins) \) in this formula, and \( P(Loses) \) should also be given a subscript. The equation summarizing the expected resources for a player is thus

\[ \sum_{i=0}^{n} [ P(Wins, i) \cdot 1 + P(Loses, i) \cdot 0 + (1 - P(Wins, i) - P(Loses, i)) \cdot q_i ] \]

which simplifies to

\[ \sum_{i=0}^{n} [ P(Wins, i) + (1 - P(Wins, i) - P(Loses, i)) \cdot q_i ] \]

This simple formula describes what happens if the war is fought to its military conclusion. It thus describes the world of the FIGHT outcome for a given player. Since one needs to distinguish between the two sides, I will hereafter use \( q_i \) to refer to the share
of military capability held by the government and \( l - q \), to refer to the share held by the rebels. Since the probability the government wins is equal to the probability the rebels lose, and the probability the government loses is equal to the probability the rebels win. I will simply use \( P(G\text{Wins}_i) \) and \( P(G\text{Loses}_i) \) in all equations. These terms represent the probability of government victory or government defeat, respectively. Therefore the outcome FIGHT can be described as the government getting a total of

\[
\sum_{i=0}^\xi [P(G\text{Wins}_i) + (1 - P(G\text{Wins}_i) - P(G\text{Loses}_i)) \cdot q_i]
\]

and the rebels getting

\[
\sum_{i=0}^\xi [P(G\text{Loses}_i) + (1 - P(G\text{Wins}_i) - P(G\text{Loses}_i)) \cdot (1 - q_i)]
\]

I now turn to the variations from these straightforward peace and war outcomes. In the outcome NEGODD, both sides defect from the accord. In this outcome, the fighting stops for one time period as agreement is negotiated and demobilization or integration before implementation begins. During this period, neither side relinquishes its wartime gains, for to do so would require a successful implementation phase. Upon the collapse of the agreement, the war then resumes from where it left off. So the total resources controlled under NEGODD can be expressed as

\[
q_0 + \sum_{i=0}^\xi [P(G\text{Wins}_i) + (1 - P(G\text{Wins}_i) - P(G\text{Loses}_i)) \cdot q_i]
\]

for the government and

\[
(1 - q_0) + \sum_{i=0}^\xi [P(G\text{Loses}_i) + (1 - P(G\text{Wins}_i) - P(G\text{Loses}_i)) \cdot (1 - q_i)]
\]

for the rebels.
When only one side defects, however, the situation is altered in the following fashion. If the government defects and the rebels cooperate (NEGO$_{DC}$) then $q_t$, the share of military capability commanded by the government, is increased after the initial time period. Since the probability of winning is surely affected by the military balance, that is, $P(G\text{Wins}_t) = f(q_t)$, increasing $q_t$ increases $P(G\text{Wins}_t)$ and decreases $P(G\text{Loses}_t)$. Given this, a government that defects can expect both a greater chance of victory and a larger share of resources during the intrawar period. Depending on the circumstances of the war and the proposed agreement, this advantage may be relatively minor or profound. Unilateral defection by the government $q_t$ at a minimum, and probably also increases $q_t$ for all $t$ such that $t>1$ as well. Similarly, a unilateral rebel defection (NEGO$_{CD}$) will decrease $q_t$ and increase $P(G\text{Loses}_t)$, while decreasing $P(G\text{Wins}_t)$.

These are the outcomes possible given the choices of the players: agreement and mutual cooperation (NEGO$_{CC}$), rejection of agreement and continued warfare (FIGHT), agreement that collapses with mutual defection (NEGO$_{DD}$), and agreement in which one side takes advantage of the other (NEGO$_{DC}$, NEGO$_{CD}$). With these outcomes defined descriptively and in terms of the quantity of resources gained by each side, it is necessary to define the payoffs that the players associate with these outcomes.

2.3 PAYOFFS AND EXPECTED UTILITY

I use expected utility to indicate the payoff that each player associates with each outcome. In particular, I assume that both sides in a civil war will behave as if they are risk-neutral decision-makers maximizing expected utility over outcomes. With the
players, strategies, structure, and outcomes of the civil war termination game in place. It is therefore necessary to define the expected utility associated with each outcome for each player. Again, the two war outcomes are simply treated as one outcome, since it is assumed that both carry equal utility – fighting to the finish is the same regardless of which path is taken to that outcome. The outcomes to be assessed are thus FIGHT and the four variants of NEG.

2.3.1 PARAMETERS

Each of these outcomes is associated with an expected utility function for each player. These functions are constructed exclusively from the share of capabilities held by the government, each side’s expectations about the costs of war, the degree of military advantage conferred by unilateral defection, and a discount parameter. These are represented by $q$, $C$, $D$, and $d$, respectively. Table 2.2 summarizes these terms.
### Table 2.2 Parameters Underlying the Civil War Termination Game

**Terms in Utility Functions (Sections 2.2 and 2.3)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t$</td>
<td>Denotes time period</td>
<td>$-1$ to $\infty$</td>
<td>$-1$ refers to values before analysis point. $0$ refers to initial time period of analysis. $1$ and above refer to future time periods.</td>
</tr>
<tr>
<td>$q_t$</td>
<td>Government's share of total military capabilities</td>
<td>0 to 1</td>
<td>Determines the probability of winning or losing as well as the share of resources one enjoys while fighting continues.</td>
</tr>
<tr>
<td>$C^G_t$</td>
<td>Costs suffered by Government, subscripted by time period</td>
<td>0 to 1</td>
<td>Denotes costs of continuing to fight. Completely determined by other variables.</td>
</tr>
<tr>
<td>$C^R_t$</td>
<td>Costs suffered by Rebels, subscripted by time period</td>
<td>0 to 1</td>
<td>Denotes costs of continuing to fight. Completely determined by other variables.</td>
</tr>
<tr>
<td>$d$</td>
<td>Discount parameter</td>
<td>0 to 1</td>
<td>Higher value means lower discount / indicates long-term emphasis.</td>
</tr>
<tr>
<td>$D$</td>
<td>Advantage to defection</td>
<td>1 to 2 when $q = .5$</td>
<td>If one defects and one's opponent does not, then one's own proportion of forces is multiplied by this parameter to determine the new ratio of forces.</td>
</tr>
</tbody>
</table>

**Terms in War Expectations Model (Section 2.4)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>$a_1, b_1$</td>
<td>Shape parameters of function describing expected changes in force ratio</td>
<td>0 to 1: varies</td>
<td>Determines how known force ratios are transformed into expected future force ratios</td>
</tr>
<tr>
<td>$z$</td>
<td>Shape parameter of function describing expected war outcomes</td>
<td>&gt;1: Assumed to be 4</td>
<td>Determines how force ratios are transformed into expectations about who wins</td>
</tr>
<tr>
<td>$K^G_t$</td>
<td>Rate of change in government costs, subscripted by time period</td>
<td>-1 to 1</td>
<td>Represents the rate of increase or decrease in expected government cost levels over time</td>
</tr>
<tr>
<td>$K^R_t$</td>
<td>Rate of change in rebel costs, subscripted by time period</td>
<td>-1 to 1</td>
<td>Represents the rate of increase or decrease in expected government cost levels over time</td>
</tr>
</tbody>
</table>
It should be re-emphasized that both players have access to the same information and therefore I assume that both players have identical estimates for the value of any given parameter.

Each of these parameters is necessary for a coherent story of civil war termination. The relevance of the military balance is given by its effects on the probability of winning and losing, its influence on the duration of the war by influencing these two probabilities, and its role in determining the share of resources held by each side during the war. Costs are what separate military outcomes from negotiated ones: the social, personal, political, and physical destruction wrought by war precludes full enjoyment of the resources one holds. What is gained through hard fighting would be sweeter if gained without suffering, and a term to capture this verity is necessary. The defection advantage is a necessary component of the postwar security dilemma as applied to civil wars: it is this that gives some positive incentive to cheat. Finally, the discount parameter helps represent the "shadow of the future" on decision-makers. Resources gained sooner are worth more than those expected to be gained in the distant future. Whether this represents the fact that no one can be sure they will rule (or live) forever or simply short-term thinking, it provides an incentive to deal now instead of a century from now.

As noted above, I allow $q$, the ratio of government military power to the combined military power of both the government and rebels, to vary over time as the military balance shifts. More precisely, the expected value of $q_t$, or $E(q_t)$, can be different for each $t$. An example of this would be the American Civil War in late 1864, when the
Union was superior in military capabilities and both sides expected its military superiority to increase as time passed.

The parameter \( C \) is different for each player, and each player's expected costs can vary over time. I therefore refer to the expected value of this term as

\[ E(C^r) \] for the government and \( E(C^s) \) for the rebels.

These terms represent the expected marginal costs of fighting from the beginning of period \( t \) to the end of period \( t \). A player may expect marginal costs to increase or decrease over time for any number of reasons. An expected increase could be due to increasingly intense fighting, a shift in strategy by its opponent, threats of outside sanctions, or other political-military developments.

\( D \) and \( d \) are characteristics of the war itself and so do not differ for each player. They are necessary theoretical components, but they are constants with respect to a particular war and do not vary over time. Since the central substantive question of interest is what external actors can do to influence the outcome of a civil war, I choose to simplify the most with respect to those parameters that appear to be less amenable to external manipulation. Instead, I give the traditional realist variables of capabilities, commitments, and costs their due by focusing on the effects of shifts in the balance of military capabilities (including shifts resulting from external intervention) and changes in expectations about costs.
2.3.2 FRAMEWORK

The expected utility of the NEGO outcomes as compared to the FIGHT ones depends on the nature of the postwar security dilemma faced by the parties – Figure 2.2 summarizes the differences between utility functions associated with NEGO and FIGHT outcomes in light of the previous discussion of these outcomes.

Figure 2.2 Summary of utility functions associated with NEGO and FIGHT outcomes

<table>
<thead>
<tr>
<th></th>
<th>Period 0</th>
<th>Period 1</th>
<th>Period 2, etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEGO</td>
<td>Agreed % of Resources</td>
<td>Agreed % of Resources (discounted)</td>
<td>Agreed % of Resources (discounted)</td>
</tr>
<tr>
<td>Mutual Cooperation</td>
<td>Resources divided by military balance</td>
<td>WAR (discounted)</td>
<td>WAR (discounted)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Military balance shifts in Defector's favor</td>
<td>Military balance calculated from Period 1</td>
</tr>
<tr>
<td>NEGO</td>
<td></td>
<td>WAR (discounted)</td>
<td>WAR (discounted)</td>
</tr>
<tr>
<td>One Side Defects</td>
<td></td>
<td>Military balance identical to pre-settlement balance</td>
<td>Military balance calculated from Period 1</td>
</tr>
<tr>
<td>NEGO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mutual Detection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIGHT</td>
<td></td>
<td>WAR (discounted)</td>
<td>WAR (discounted)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Military balance calculated from Period 0</td>
<td>Military balance calculated from Period 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In order to construct expected utility functions, the discount parameter \( d \) was used to model the idea that people value the short-term at least somewhat more than the long...
term. The effect of \( d \) is exponential, as the utility for any given time period is multiplied by \( d^t \). Table 2.3 demonstrates the degree of long-term thinking associated with a range of values of this variable, given equal utility in every future period.

<table>
<thead>
<tr>
<th>Discount</th>
<th>Total Utility</th>
<th>% in First Period</th>
<th>% in First Two Periods</th>
<th>% in First Three Periods</th>
<th>% in First Four Periods</th>
<th>% after 10 Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>1.11</td>
<td>0.9</td>
<td>0.99</td>
<td>0.999</td>
<td>0.9999</td>
<td>10^{-10}</td>
</tr>
<tr>
<td>0.2</td>
<td>1.25</td>
<td>0.8</td>
<td>0.96</td>
<td>0.992</td>
<td>0.9984</td>
<td>10^{-7}</td>
</tr>
<tr>
<td>0.3</td>
<td>1.43</td>
<td>0.7</td>
<td>0.91</td>
<td>0.973</td>
<td>0.9919</td>
<td>10^{-5}</td>
</tr>
<tr>
<td>0.4</td>
<td>1.67</td>
<td>0.6</td>
<td>0.84</td>
<td>0.936</td>
<td>0.9744</td>
<td>0.0001</td>
</tr>
<tr>
<td>0.5</td>
<td>2</td>
<td>0.5</td>
<td>0.75</td>
<td>0.875</td>
<td>0.9375</td>
<td>0.0009</td>
</tr>
<tr>
<td>0.6</td>
<td>2.5</td>
<td>0.4</td>
<td>0.64</td>
<td>0.784</td>
<td>0.8704</td>
<td>0.006</td>
</tr>
<tr>
<td>0.7</td>
<td>3.33</td>
<td>0.3</td>
<td>0.51</td>
<td>0.657</td>
<td>0.7599</td>
<td>0.028</td>
</tr>
<tr>
<td>0.8</td>
<td>5</td>
<td>0.2</td>
<td>0.36</td>
<td>0.488</td>
<td>0.5904</td>
<td>0.1</td>
</tr>
<tr>
<td>0.9</td>
<td>10</td>
<td>0.1</td>
<td>0.19</td>
<td>0.271</td>
<td>0.3439</td>
<td>0.34</td>
</tr>
</tbody>
</table>

Note that values of \( d \) up to .5 are similar in the sense that they represent situations in which the decision-makers care more about the next period than all the periods afterwards put together – a situation of extremely short-term thinking. The first two periods make up more than half the total expected utility if \( d < .707 \). The first three if \( d < .794 \), and the first four if \( d < .841 \). When \( d > .841 \), it takes at least 5 periods before half of the total expected utility is reached, indicating a long shadow of the future for decision-makers.
2.2.3 NEGOTIATION

The utility functions for NEGO outcomes when both sides abide by the agreement are simple:

\[ U^{\text{\textup{NEGO}}_{\text{\textup{Offer}}}} = \sum_{i=0}^{r} d^i \text{Offer} \]

\[ U^{\text{\textup{NEGO}}_{\text{\textup{Non-offer}}}} = \sum_{i=0}^{r} (1 - \text{Offer}) \]

Since defection means retaining one’s absolute level of capabilities and restarting the war, the result of mutual defection is one period’s respite from fighting followed by a resumption of the war where it left off:

\[ U^{\text{\textup{NEGO}_{\text{\textup{Defect}}}}} = E(q_0) + U^{\text{\textup{FIGHT}}_{\text{\textup{Defect}}}} \]

\[ U^{\text{\textup{NEGO}_{\text{\textup{Non-defect}}}}} = 1 - E(q_0) + U^{\text{\textup{FIGHT}}_{\text{\textup{Non-defect}}}} \]

Once again, when defection is not mutual, the side that retained its capabilities will have a military advantage relative to the pre-agreement period. The exact degree of advantage is described by the variable \( D \), which modifies \( q \) in the following manner, given unilateral defection by the government: \( E(q_{1}) = D \cdot E(q_{0}) \)

The effect is multiplicative. so \( D \) must be greater than 1 because a value of 1 would indicate no change in \( q \) and so no defection advantage at all. It must also be less than the reciprocal of the weaker side’s share of capabilities, because multiplying that share by its reciprocal gives a value of 1 for \( q_{1} \), or no opponent to fight. Certainly anything larger than this would generate the absurd conclusion that one side could control more than
100% of resources by defecting. Therefore, \( 1 < D < 1/q_0 \) when \( q_0 < .5 \) and \( 1 < D < 1/(1-q_0) \) when \( q_0 > .5 \). The multiplicative effect of \( D \) on \( q \) and the effect this has on each side's expected utility, is given by

\[
\begin{align*}
U''(NEGO, x) &= E(q_0) + U''(FIGHT_{1-x}) \text{ given that } E(q_1) = E(q_0) \cdot D) \\
U''(NEGO, x) &= (1 - E(q_0)) + U''(FIGHT_{1-x}) \text{ given that } E(q_1) = E(q_0) \cdot D) \\
U''(NEGO, x) &= E(q_0) + U''(FIGHT_{1-x}) \text{ given that } E(q_1) = 1 - D[1 - E(q_0)] \\
U''(NEGO, x) &= (1 - E(q_0)) + U''(FIGHT_{1-x}) \text{ given that } E(q_1) = 1 - D[1 - E(q_0)]
\end{align*}
\]

Naturally, there is an advantage to defection only to the extent that \( q \) is expected to affect the course of the war such that increasing it helps the government and decreasing it helps the rebels. It is to this relationship that I now turn.

### 2.2.4 Fighting

What remains is the expected utility of fighting. One component of this is the resources each side expects to gain from war, which was given for the government by

\[
\sum_{i=0}^{c} [P(GWins, i) + (1 - P(GWins, i) - P(GLoses, i)) \cdot q_i]
\]

Costs suffered while fighting diminish the utility of a player for control over resources—they detract from the enjoyment of political power. Adding the cost term to this simple function yields

\[
\sum_{i=0}^{c} \left[ P(GWins, i)(1 - E(C^i_1)) + P(GLoses, i)(0 - E(C^i_1)) + \right. \\
\left. (1 - P(GWins, i) - P(GLoses, i))(E(q_i) - E(C^i_1)) \right]
\]
The problem with this formula is that although fighting and winning does indeed involve paying some costs, those costs cease to accrue after victory is achieved. Victory and defeat both bring peace. Therefore, a proper accounting of resources and costs requires an accounting of two additional possibilities – that a side won in a previous time period or lost in a previous time period. In the former case, the side receives 1, not 1-C, and in the latter it receives 0, not 0-C. These possibilities can be captured by simply adding two more probability terms, \( P(\text{GIlost}_t) \) and \( P(\text{GWon}_t) \):

\[
\sum_{t=1}^{\infty} \left[ P(\text{GIWins}_t, 1 - E(C''')) + P(\text{GIloses}_t, 0 - E(C''')) + P(\text{GWon}_t, 1) + P(\text{GIlost}_t, 0) \right] (1 - P(\text{GIWins}_t) - P(\text{GIloses}_t) - P(\text{GWon}_t) - P(\text{GIlost}_t) E(q_t) - E(C'''))
\]

Of course, since we know the sides are currently fighting, the “already won” and “already lost” probabilities must be equal to zero in the first time period of fighting. Thereafter,

\[ P(\text{GWon}_t) = P(\text{GWon}_{t-1}) + P(\text{GWins}_{t-1}) \mid t > 0 \]

\[ P(\text{GIlost}_t) = P(\text{GIlost}_{t-1}) + P(\text{GIloses}_{t-1}) \mid t > 0 \]

Having incorporated resources gained and costs suffered, it remains to incorporate discounting and simplify to produce the expected utility of war for each player:

\[
L''(\text{FIGHT}) = \sum_{t=0}^{\infty} d^t \left[ P(\text{GIWins}_t, 1 - E(C''')) - P(\text{GIloses}_t, E(C''')) + P(\text{GWon}_t) + (1 - P(\text{GIWins}_t) - P(\text{GIloses}_t) - P(\text{GWon}_t) - P(\text{GIlost}_t)) (E(q_t) - E(C''')) \right]
\]
\[ U^* (\text{FIGHT}) = \sum_{t=0}^{d'} \left[ P(\text{GLoses}_t | 1 - E(C_t^*)) - P(\text{GWins}_t | E(C_t^*)) + P(\text{GLost}_t) + (1 - P(\text{GWins}_t) - P(\text{GLoses}_t) - P(\text{GWon}_t) - P(\text{GLost}_t)) \right] \]

In order to further specify and solve the general utility functions above, it is necessary to understand three things – how players expect \( q \) to change over time, how players expect the various probability terms to change over time, and how players expect the \( C \) terms to change over time. In short, further analysis of these utility functions requires a model of what players expect from the process of war.

### 2.4 Modeling War Expectations

The need for three critical pieces of information necessitates some model of what the participants in a civil war expect to happen as they fight. These can be summed up as the search for the right-hand terms in the following equations.

- \( E(q_t) = f(E[q_{t-1}]) \)
- \( P(\text{GWins}_t) = f(E[q_t]) \)
- \( P(\text{GLoses}_t) = f(E[q_t]) \)
- \( E(C_t) = f(E[C_{t-1}]) \)

Each of these functions requires a number of additional assumptions before it can be specified, and so this section addresses each function in turn.
2.4.1 EXPECTED BALANCE OF MILITARY CAPABILITIES: $E(q_t) = f(q_{t-1})$

A function giving the expected value of a period's ratio of forces from the expected value of the previous period's force ratio is required. There are several constraints on this function. First, it must be monotonic and increasing from 0 to 1 – all else being equal, I do not expect that there are points at which having a more favorable ratio of forces actually reduces the value of the expected ratio of forces next time period for a given player. Second, it must be symmetric because the ratio from one's own perspective is always one minus the ratio from the opponent's perspective. One cannot expect to control 80% of military forces and expect one's opponent in this dyadic war to control anything other than 20%. Third, it must pass through three points:

- When the existing force level is zero (ie one side no longer exists), so must be the expected force ratio.
- By symmetry, the same holds for a force ratio of one.
- When the force ratio is .5 (both sides are in perfect balance), knowing the force ratio alone does not allow one to predict either an increase or a decrease – there is no theoretical reason to expect one or the other (particularly given the symmetry assumption).

Thus the function must pass through [0.0], [.5..5], and [1.1]. A fourth restriction existing on this function is that if the existing ratio of forces is below .5, it cannot be expected to be above .5 next time period. The bigger side shouldn't be losing if all we know is the
force ratio. for if such a general rule held the bigger side would be the smaller side next
time period and thus become the bigger side again in the third time period and so forth.
This restriction excludes truly absurd functions that predict that every time period, the
military advantage will change sides, oscillating back and forth in what are likely to be
ever-more absurd cycles.

A reasonable model of changes in force ratio must meet these four conditions, for
without any one of them absurd outcomes are predicted. However, these still leave a vast
range of possible functions: these assumptions merely restrict the range of the values of
these functions to the shaded areas in Figure 2.3, impose symmetry on the functions, and
require monotonicity.

Figure 2.3. Range of permissible functions under basic assumptions

![Chart](chart.png)

In order to further limit the range of functions, a fifth assumption is used in addition to
the four basic assumptions above. I assume that the function representing the expected
ratio of forces as a function of the known ratio is of cubic or lower order – visually, the
number of “bends” cannot exceed two. This assumption is reasonable and useful. First, what is being modeled is not the real relationship between force ratios over time during warfare but rather the expected relationship, which should be somewhat more intuitive and simple. Second, using cubic functions allows the representation of the notion that the bigger side expects to be even bigger next time period, as its superior resources allow it to do more than preserve the existing ratio and actually defeat part of its opponent’s forces or grow its own at a greater rate – either of which leads to an expectation of an even more favorable force ratio next time period. Without a reason to expect a more complicated relationship than this, a cubic function is sufficient to represent all reasonable expectations.

As a plausibility probe, the relationship of the force ratio one year to the force ratio the next during wartime was examined for interstate wars, as illustrated by Figure 2.4, which plots the force ratio for all continuing war-years (the war neither began nor ended that year) against the next year’s force ratio (providing that it was also a continuing war-year). The data used are drawn from the Correlates of War Project’s datasets on military power (in this case, the variable of how many troops a state has) and interstate war (to establish the war years).

While a few cases in the area of [.5..5] fall outside the expectations of this theory (most are Second World War cases involving Bulgaria and Romania), most fall within the boundaries set by the assumptions. Moreover, although the plot becomes more spread out in this region, this simply reflects increased error – the expected value of next year’s force ratio remains close to .5 when the existing ratio is near .5. The graph is of
course symmetric because the perspective of both parties was plotted. A few exploratory
tests showed that a simple linear function $f(x)=x$ predicted almost as well as more
complex cubic functions (the differences in $R^2$ were infinitesimal – see Table 2.4 for a
summary). This may of course represent a selection effect – when force ratios are
expected to grow worse for one side that side may give in to its opponent, thus censoring
the data. Nevertheless, this exercise does seem to suggest that bizarre, extreme functions
should not be the first resort when one models changes in force ratios.

Figure 2.4. Changes in Force Ratio During Interstate Wars
Table 2.4 Historical Change in Military Balance During Interstate Wars – Comparison of Models

<table>
<thead>
<tr>
<th>Model</th>
<th>$R^2$</th>
<th>Significance</th>
<th>$\beta_1$</th>
<th>$\beta_2$</th>
<th>$\beta_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear</td>
<td>.987</td>
<td>.000</td>
<td>1.005</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Cubic</td>
<td>.987</td>
<td>.000</td>
<td>.965</td>
<td>.106</td>
<td>-.065</td>
</tr>
</tbody>
</table>

All models computed without intercept. $R^2$ differs after three more digits (naturally the cubic model has a slightly larger $R^2$).

Since all five assumptions appear to be reasonable ones, the general function representing the expected change in the force ratio must be either a cubic or linear function of last period’s force ratio. Quadratic equations fail to simultaneously meet requirements of symmetry and adherence to the range of permissible values and can thus be ignored. Since I have no reason to expect one such function to be more likely than another, a set of parametric equations was constructed using a Bezier approach that represents every cubic function meeting the basic requirements outlined above using only last period’s expected force ratio and two shape parameters. Figure 2.5 presents extreme (1 and 5), middle (2 and 4), and linear (5) functions derived from this approach. Every derivation from this model holds regardless of which of these functions is used in the combat model. Thus the model of expected changes in force ratios is quite general and requires no particular assumptions about how combat actually works. These functions, and those “between” them, represent the range of permissible functions.\(^\text{37}\)

\(^{37}\) Note that although this is not illustrated, the cubic functions can be “skewed” so that their bends occur closer to or further from [.5 5] – the functions still must remain within
The cubic function used requires two parameters (a₁ and b₁), which together move the "bends" outward and either toward or away from [.5,.5]. These parameters are themselves limited to a range of 1/3 between their minimum and maximum values (the specific minimum and maximum values depend on whether the first "bend" is to be below or above the line labeled 5. With very few constraining assumptions, most of which simply prevent absurd functions, the entire range of possible expectations can be represented by manipulating the two shape parameters of the cubic Bezier equations.

Functions one through five are the "combat models" used in this analysis, as they represent a reasonable range of expectations regarding the outcome of combat. Thus, combat models one and two represent the expectation of both sides that the larger party will gain on its opponent over time, combat model three assumes each side expects the current military situation to continue unless someone wins, and the final two combat

the boundaries presented in Figure 2.5 (for example, no "sharper" curves can be
models represent the expectations of each side that over time, the two parties will become more even in terms of relative capabilities. I assume that a single combat model represents expectations about a given war – the sides do not expect the bigger party to make gains and then lose them, for example.

2.4.2 PROBABILITY ESTIMATES FOR WINNING AND LOSING:

\[ P(G\text{Wins}_t) = f(q_t) \quad \text{and} \quad P(G\text{Loses}_t) = f(q_t) \]

I assume that the probability of winning varies with the value of \( q \) – the stronger side is more likely to win. A simple representation of this is to conceive of the probability of the government winning as \( E(q_t)^r \) and the probability of the government losing as \( 1 - E(q_t)^r \). In the case of \( z = 1 \), the probability of the war continuing is 0, since \( E(q_t) = (1 - E(q_t)) = 1 \). As \( z \) increases, the chance of the war continuing increases. Table 2.5 shows the chances of war continuing when \( E(q_t) \) is .5 (the maximum probability of continuation) and .9 (when the government has a 9:1 advantage).
Table 2.5 Probability war continues by value of \( z \)

<table>
<thead>
<tr>
<th>( z )</th>
<th>Probability that war continues. ( E(q_t) = .5 )</th>
<th>Probability that war continues. ( E(q_t) = .9 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>.5</td>
<td>.18</td>
</tr>
<tr>
<td>3</td>
<td>.75</td>
<td>.34</td>
</tr>
<tr>
<td>4</td>
<td>.88</td>
<td>.47</td>
</tr>
<tr>
<td>5</td>
<td>.94</td>
<td>.57</td>
</tr>
<tr>
<td>6</td>
<td>.97</td>
<td>.65</td>
</tr>
<tr>
<td>7</td>
<td>.98</td>
<td>.72</td>
</tr>
</tbody>
</table>

There is an arbitrary element to picking any value of \( z \). What is necessary is that the likelihood of someone winning in a single time period when the sides are evenly matched be relatively low, yet the chance of winning with a massive advantage be relatively high. In other words, continuation should be common at \( E(q_t) = .5 \) and rare at \( E(q_t) = .9 \).

Values of \( z=3 \), \( z=4 \), and \( z=5 \) all meet this criteria to some extent; \( z = 4 \) is a reasonable "compromise" among those values. This creates a simple set of equations for winning and losing:

\[
P(G\text{Wins}_t) = E(q_t)^4 \quad \text{(given that the war lasts until time } t)\]

\[
P(G\text{Loses}_t) = (1 - E(q_t))^4 \quad \text{(given that the war lasts until time } t)\]
2.4.3 EXPECTED MARGINAL COSTS OF WAR: $E(C_t) = f(E[C_{t+1}])$

Costs are a broader concept than casualties alone. War may cost a leader political support. It may rob a leader of resources that might be enjoyed personally and instead must be spent on military action, it may kill citizens and wreck roads or it may otherwise prevent the full enjoyment of the resources under a leader’s control in a myriad of ways. Therefore, to preserve the greatest level of generality, only a few assumptions about costs are made.

First, costs suffered in a period of war must be greater than zero and less than one. Since costs are subtracted from the expected utility of warfare, I assume that a side always prefers controlling the same share of resources without fighting than with fighting or is at most indifferent between the two. This accounts for the minimum of zero. War may indeed be profitable, but neither side can prefer fighting for profits to making the same profits without having to fight.

I have chosen to set the utility of controlling the authoritative allocation of resources in a period to one. I assume that the most one side could do to its opponent is to inflict suffering that exactly balances out the utility of a 100% chance of controlling everything, or one. Imagine the following situation:

- Both players know that the government is sure to win (100% chance) at the end of one period of fighting.
- The government knows that if it offers its own unconditional surrender to the rebels, the rebels will accept and both sides will honor the agreement.
The $d$ parameter is 0, so that both sides are incredibly short-sighted, caring for nothing except the first time period.

The government weighs the expected utility of winning the war against the expected utility of its own unconditional surrender, so it compares $1 - C_i^{t_1}$ to 0. I assume that the rebels can never make war so costly for the government that the first term is negative. Given a choice between sure victory through war and sure defeat through agreement, the government will prefer sure victory through war or be indifferent between the two.

The second assumption regarding costs is that expected costs for a given time period of fighting for a given actor are a function of costs expected to be suffered by that actor each previous time period and some rate of change as costs move closer to one or zero. In other words, even though sunk costs are in the past and so do not matter for their own sake, they are baseline indicators of future marginal costs, from which upward or downward movement can occur. A simple multiplier ($K^G$ or $K^R$) is the simplest way to represent this expected trend:

$$E(C_i^{t_1}) = E(C_i^{t_1}) + K^G[1 - E(C_i^{t_1})]$$
$$E(C_i^{t_1}) = E(C_i^{t_1}) + K^R[1 - E(C_i^{t_1})]$$

if costs are expected to increase ($K^G$ or $K^R > 0$) and

$$E(C_i^{t_1}) = E(C_i^{t_1}) + K^G E(C_i^{t_1})$$
$$E(C_i^{t_1}) = E(C_i^{t_1}) + K^R E(C_i^{t_1})$$

---

For the mathematically inclined, each side evaluates the costs from choosing to fight to the finish. Imagine a function representing total expected costs, beginning at zero and increasing over time. The $C_i$ terms are analogous to the first derivative or slope of this function, while the $K$ parameters are analogous to the second derivative.
if costs are expected to decrease ($K^G$ or $K^R < 0$). Expected costs for the rebels are computed the same way: in either case, $K^G$ and $K^R$ are limited between -1 and 1. Table 2.6 illustrates the relationship between the initial level of costs, the parameters $K^G$ and $K^R$, and costs over ten time periods.
Table 2.6 Expected costs from $t=0$ to $t=9$ given initial cost level ($C^G_0$) and expected change parameter ($K^G$)

<table>
<thead>
<tr>
<th>$C^G_0 = .1$</th>
<th>$C^G_0 = .5$</th>
<th>$C^G_0 = .9$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$K^G$</td>
<td>$E(C^G_1)$</td>
<td>$E(C^G_2)$</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>-0.9</td>
<td>0.01</td>
<td>0.001</td>
</tr>
<tr>
<td>-0.5</td>
<td>0.05</td>
<td>0.025</td>
</tr>
<tr>
<td>-0.1</td>
<td>0.09</td>
<td>0.081</td>
</tr>
<tr>
<td>0</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>0.1</td>
<td>0.19</td>
<td>0.271</td>
</tr>
<tr>
<td>0.5</td>
<td>0.55</td>
<td>0.775</td>
</tr>
<tr>
<td>0.9</td>
<td>0.91</td>
<td>0.991</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>$K^G$</td>
<td>$E(C^G_1)$</td>
<td>$E(C^G_2)$</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>-0.9</td>
<td>0.05</td>
<td>0.005</td>
</tr>
<tr>
<td>-0.5</td>
<td>0.25</td>
<td>0.125</td>
</tr>
<tr>
<td>-0.1</td>
<td>0.45</td>
<td>0.405</td>
</tr>
<tr>
<td>0</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>0.1</td>
<td>0.55</td>
<td>0.595</td>
</tr>
<tr>
<td>0.5</td>
<td>0.75</td>
<td>0.875</td>
</tr>
<tr>
<td>0.9</td>
<td>0.95</td>
<td>0.995</td>
</tr>
</tbody>
</table>

What might affect the $K$ parameters? Obviously, if an opponent is expected to get better at imposing costs, $K$ will be positive. It is possible that in some wars $K$ is a function of the number of troops involved or perhaps the strategies being used by each side. $K$ is not expected to change over the course of the conflict because it encapsulates...
each sides expectations about change in costs. Perhaps K would be more likely to be positive if an intervenor threatened to bomb one or both sides if the war continued. It could be zero if it were the case that the opponent is expected to keep inflicting the same number of casualties in every time period given continued war (and given that a player was only hurt by taking casualties). If these conditions were true and it was the case that the first deaths hurt more than later deaths, then K would be negative. In short, K is an abstraction of whatever process leads the parties to believe that their marginal costs of war are going to increase or decrease.

2.5 SUMMARY

Civil war is an internal armed contest for control of the resources generated within a state. This process can be represented as a game with an initial negotiation phase and a post-negotiation subgame. The Civil War Termination Game captures both the coercion and bargaining processes of civil war. It includes the security dilemma thought by many to be crucial in ending a civil war, accounts for the effects of the military situation on the appeal of a given negotiated settlement, models the asymmetric structure of civil wars, and represents the shadow cast by the expectations about the future on the decisions of the moment.

While the utility functions are useful for capturing this shadow of the future and representing these features of civil war, they have the drawback of being difficult to solve analytically. However, approximate solution of these equations is possible and allows the game to be solved in pure or mixed strategies. This model— the civil war termination
game and the equations giving the expected utility associated with its outcomes – is capable of producing a very large number of implications, some of which are presented in Chapter 3.
Chapter 3

IMPLICATIONS AND HYPOTHESES

The model generates propositions regarding important types of civil war outcome: whether agreement is reached, the form of that agreement, the likely winner given a military solution, and the chances for speedy termination of a civil war. While the theory generates a large number of interesting implications, the degree to which it is useful must be measured by its ability to reveal unexpected empirical phenomena. This chapter addresses the method used to solve the Civil War Termination Game (CWTG), the implications thereby derived from the model, how external actors might manipulate the critical parameters of the model, and hypotheses regarding the role of capabilities, costs, commitments, and the outcome of civil wars.

3.1 SOLUTION AND DERIVATION

Because of the decision to model the actual postwar world as a dynamic system with utility that changes over time, incorporating the war process model in the expected utility functions results in statements that are difficult to reduce or evaluate using the traditional comparative statics approach. Because there is some probability that the government wins the war in a given period and a probability that something else (either a continuation of the war or opposition victory) occurs, and because both these probabilities and utilities over the respective conditions are functions of previous values of themselves, problems arise. An expected utility function describing one time period of war is a simple matter of the probability of each condition times the utility associated with that condition.
However, if the expected utility function is to be extended to cover two periods, then one must add new possibilities to the equation: namely, the possibilities of fighting for one period and then winning and of fighting for one period and then losing. For each additional period the number of terms in the utility function increases. Moreover, there are few simple mathematical rules that enable simplification of these utility functions so that the impact of marginal changes may be easily derived. This does not mean that the equations are insoluble, but it does mean that the best approach for the social scientist may be one of approximation.

To deal with this dilemma, I created a program in the GAUSS environment that takes as its inputs the values of the model’s parameters and then outputs the equilibrium of the CWTG given those parameters. The specific inputs used are 25,000 values of each parameter drawn randomly from a uniform distribution over the permissible range of values for each parameter. It is important to note that there is no randomness involved in finding the solution to the CWTG given an initial set of parameters – the program is fundamentally an equation-solver which approximates the infinite series of the utility functions by iteration to a large but finite number of rounds.\textsuperscript{39} Since the discount parameter ensures that the marginal effects of each period on the total expected utility quickly diminish, an approximate numerical solution to each utility function may be obtained in a reasonable number of periods. Using this information, the program then solves the game and determines the predicted outcome. Flowcharts 1 and 2 are simplified outlines of the utility-generating and game-solving routines, respectively.
Flowchart 3.1 Main program and expected utility generating routines.

1. Begin
2. Load predetermined matrix of \( q \rightarrow q \)
3. Load variables and parameters, precalculate constants
4. End
5. Yes
   - Loop: Compute expected change in \( q \) given NEOG, using linear interpolation between values in loaded matrix
   - Loop: Form matrix of probabilities of each state of the world during each time period given FIGHT outcome
   - Loop: Form matrix of expected costs of each period of fighting for each side
   - Loop: Compute the expected utilities of FIGHT probability of state of the world in given period, utility of that state of the world and discounted
   - Compute expected utilities of NEOG, initial value of \( q \) or \( 1-q \) plus utility of 9 periods of fighting afterward (first nine periods of FIGHT with additional discount).
   - Compute utility of NEOG for each possible offer, discounted offer over 10 periods
   - Loop: Compute expected change in \( q \) given NEOG, using linear interpolation between values in loaded matrix

6. No
   - Loop: Form matrix of probabilities of each state of the world during each time period given NEGIOG, outcome
   - Loop: Since costs are same in first 9 periods of FIGHT outcome, compute the expected utilities of NEOG probability of state of the world in given period, utility of that state of the world and discounted.
   - Loop: Compute expected change in \( q \) given NEOG, using linear interpolation between values in loaded matrix

7. To Flowchart 2: Solving the game
8. Output results to file

Note: The program used in this analysis calculates the combined utility of the first ten time periods.
Flowchart 3.2 Game-solving routines.

In a majority of cases (combinations of parameters), there is an equilibrium in pure strategies which is possible to identify with simple backwards induction. The program
first determines the utility of the FIGHT outcomes, then analyzes the negotiation
subgame to find the utility of accepting a given offer (this process is repeated for an equal
number of increments along the possible range of government offers). Iterated
dominance is used to solve this subgame: once the utility of the negotiation subgame is
known for each possible offer, the rebels compare the utility associated with continued
war against the utility of accepting each offer and thus determine their response to each
offer. Once the rebels’ response and utility of the subsequent NEGO or FIGHT outcomes
is known for every offer, the government selects which offer, if any, to make.

In a large number of cases, it is not possible to solve the negotiation subgame through
iterated dominance. In this case, the concept of mixed strategies is used to obtain the
expected utility of this subgame for each side. This is not an assumption that sides at war
actually randomize their own actions when an agreement is reached: instead, it assumes
that when uncertainty exists, the behavior of each side in a civil war is determined as if
the sides are evaluating the subgame using its mixed strategy equilibrium – maybe
cooperation will occur and maybe it won’t. Empirically, this process resembles the
efforts of sides in negotiation to prevent an opponent from making unexpected moves or
guessing one’s own moves. Decisions will be made as if the sides attempted to create
certainty by rendering their opponents’ behavior predictable. In this model, a mixed
strategy equilibrium is simply a method of determining the expected utility of
negotiation, which in turn affects behavior by comparison to the expected utility of
fighting. The two sides only mix strategies within the domain of uncertainty (the
compliance subgame): they do not mix strategies when selecting which offer to make or whether to accept that offer.

The program thus approximates solutions to each utility function and obtains a prediction about the sides' behavior (whether the war ends through negotiation or continues and what agreement if any is reached). The results allow hypotheses to be derived from the formal model. Simply put, one can compare the initial values of any parameter to the outcomes. This is accomplished through comparison of the average values of dependent variables at given values of each parameter. This relationship is examined for direction and shape. Since the model is deterministic, the concept of "significance" is irrelevant to the derivation of implications—any change in the average value of a dependent variable given a change in a parameter is a real expectation and not the product of chance. Table 3.1 summarizes the independent variables and parameters as implemented in this program.
Table 3.1 Range of parameters used in software.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Meaning</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>( q.1 )</td>
<td>Government's initial share of total military capabilities</td>
<td>0 to 1</td>
</tr>
<tr>
<td>( \sigma )</td>
<td>Shape parameter of function describing expected changes in force ratio – see Figure 2.5 for the shape associated with each value of this parameter.</td>
<td>1 to 5</td>
</tr>
<tr>
<td>( z )</td>
<td>Shape parameter of function describing expected war outcomes</td>
<td>Assumed to be 4</td>
</tr>
<tr>
<td>( C^{\text{GT}} )</td>
<td>Costs suffered by Government in time period before game</td>
<td>0 to 1</td>
</tr>
<tr>
<td>( C^{\text{RR}} )</td>
<td>Costs suffered by Rebels in time period before game</td>
<td>0 to 1</td>
</tr>
<tr>
<td>( K^{\text{GT}} )</td>
<td>Rate of change in government costs</td>
<td>-1 to 1</td>
</tr>
<tr>
<td>( K^{\text{RR}} )</td>
<td>Rate of change in rebel costs</td>
<td>-1 to 1</td>
</tr>
<tr>
<td>( d )</td>
<td>Discount parameter</td>
<td>0 to 1</td>
</tr>
<tr>
<td>( D )</td>
<td>Advantage to defection</td>
<td>1 to 2 when ( q = 0.5 )</td>
</tr>
</tbody>
</table>

Endogenous variables incremented within the program include \( t \) (incremented from period 0 to period 9 in whole numbers), government offer (incremented from 0 to 1 inclusive at 34 equally spaced values), and the number of sample points from the solution to each model (100 points per model – the program estimates change in \( q \) by linear interpolation between these points).

A second tool used to confirm that these expected relationships derived from the game are correct is to test for interaction between parameters. While every parameter is truly independent of and uncorrelated with every other parameter, it may be that it is particular combinations of parameters that matter, since all parameters exist simultaneously in the utility functions. In fact, the utility functions mean that the theory predicts that what really matters is the combination of all parameters, not one in isolation. However, due to
the enormous number of possible combinations of parameters, only bivariate interaction
between parameters is considered – to what extent does change in the value of $x_2$ affect
the observed effects of changes in $x_1$ on $y$? The exception to this is the model of changes
in force ratio (ie the combined values of $a_1$ and $b_1$). Each examination is done separately
for each of these combinations of values in order to ensure that hypotheses about the
effects of the variables of theoretical importance are not dependent upon particular
models of how combat works. In sum, the program accomplishes most of the useful
functions of a comparative statics approach, though solutions remain approximate and it
is possible, however unlikely, that particular unexamined combinations of independent
variables have dramatic effects on dependent variables.

3.2 IMPLICATIONS AND HYPOTHESES

This theory generates a number of interesting implications. Table 3.2 shows the range
of each possible equilibrium (ie the number of times it occurred, which indicates the
breadth of conditions producing that equilibrium). All offers made by the government
are lumped together: thus Table 3.2 simply indicates whether the government makes its
best offer, not what that offer is. Note that this is not an indication of the relative
commonality of each “outcome” in the empirical world: testing each combination of
parameters is equivalent to assuming that each combination is just as likely as another
when it may be that most parameters are not distributed uniformly in the real world.
What is important is the small range of some outcomes and the complete absence of
others.
Table 3.2 Equilibria given randomly-generated values of independent variables and parameters

<table>
<thead>
<tr>
<th>Equilibrium Strategies</th>
<th>Outcome</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textit{No Offer, Reject, Defect, Defect}</td>
<td>FIGHT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>\textit{No Offer, Reject, Defect, Cooperate}</td>
<td>FIGHT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>\textit{No Offer, Reject, Cooperate, Defect}</td>
<td>FIGHT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>\textit{No Offer, Reject, Cooperate, Cooperate}</td>
<td>FIGHT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>\textit{No Offer, Reject, Mix, Mix}</td>
<td>FIGHT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>\textit{No Offer, Accept, Defect, Defect}</td>
<td>FIGHT</td>
<td>117</td>
<td>103</td>
<td>177</td>
<td>214</td>
<td>259</td>
<td>870</td>
</tr>
<tr>
<td>\textit{No Offer, Accept, Defect, Cooperate}</td>
<td>FIGHT</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>\textit{No Offer, Accept, Cooperate, Defect}</td>
<td>FIGHT</td>
<td>54</td>
<td>60</td>
<td>147</td>
<td>222</td>
<td>288</td>
<td>771</td>
</tr>
<tr>
<td>\textit{No Offer, Accept, Cooperate, Cooperate}</td>
<td>FIGHT</td>
<td>225</td>
<td>175</td>
<td>273</td>
<td>393</td>
<td>508</td>
<td>1574</td>
</tr>
<tr>
<td>\textit{Offer, Reject, Defect, Defect}</td>
<td>FIGHT</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>\textit{Offer, Reject, Cooperate, Cooperate}</td>
<td>FIGHT</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>\textit{Offer, Reject, Mix, Mix}</td>
<td>FIGHT</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>\textit{Offer, Accept, Defect, Defect}</td>
<td>NEG\textit{0}_0\textit{D}</td>
<td>537</td>
<td>640</td>
<td>542</td>
<td>427</td>
<td>376</td>
<td>2522</td>
</tr>
<tr>
<td>\textit{Offer, Accept, Defect, Cooperate}</td>
<td>NEG\textit{0}_0\textit{C}</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>89</td>
</tr>
<tr>
<td>\textit{Offer, Accept, Cooperate, Defect}</td>
<td>NEG\textit{0}_0\textit{D}</td>
<td>26</td>
<td>23</td>
<td>27</td>
<td>26</td>
<td>26</td>
<td>128</td>
</tr>
<tr>
<td>\textit{Offer, Accept, Cooperate, Cooperate}</td>
<td>NEG\textit{0}_0\textit{C}</td>
<td>960</td>
<td>1107</td>
<td>1472</td>
<td>1536</td>
<td>1432</td>
<td>6507</td>
</tr>
<tr>
<td>\textit{Offer, Accept, Mix, Mix}</td>
<td>NEG\textit{0}_0\textit{X}</td>
<td>1072</td>
<td>2885</td>
<td>2337</td>
<td>2132</td>
<td>2068</td>
<td>12494</td>
</tr>
</tbody>
</table>

\textit{Government strategies} are italicized while \textbf{rebel strategies} are in boldface. To make it easier to visualize the equilibrium path, strategies are presented in order by node information set. 5000 random combinations are evaluated with each model for a total of 25000 combinations.

Because the government makes an offer when it is indifferent, knowing the rebels will reject an agreement always leads to the government making an offer. Interestingly, the government sometimes refuses an offer not because it fears the rebels will defect but rather because it knows that both the rebels and itself will find it in their interest to cooperate in the agreement's implementation. By construction, of course, the government sometimes makes offers it knows will not be accepted since it is indifferent between offering nothing and offering something the rebels will reject. A distinctly
unsurprising implication is that the government never declines to make an offer if it knows that the rebels will accept it and become the "suckers" in the postwar agreement phase. Much more surprising is that the rebels never reject such an offer. There is no agreement that the rebels will turn down if they believe they will be the suckers in the implementation phase. Every agreement in which the rebels would rather accept the "sucker" payoff than the payoff from mutual defection is one that the rebels will accept. This simply reflects the "take it or leave it" aspect of government offers in this game: rebels lack the ability to make credible counterproposals to the institutions of government.

The results of the game were transformed into theoretically interesting outcome codes. These codes reflect particular questions about the outcome of civil wars. First, one can ask whether a civil war is likely to end in a genuine compromise on one hand, or the surrender or military defeat of one side on the other. Two outcome variables capture this distinction. First, Compromise is coded 0 if the war continues without agreement or if one side surrenders (the government makes an offer of 0 or 1 and the rebels accept). The variable is coded 1 if the pure-strategy equilibrium is negotiation followed by mutual cooperation and $0 < \text{Offer} < 1$. If a mixed strategy equilibrium is given, then the variable is coded as the chance of mutual cooperation, if $0 < \text{Offer} < 1$. This approach simply measures the probability of some negotiated agreement being reached (other than surrender). It does not distinguish between situations in which one side gets 99% and the other 1% and situations in which the sides reach a more "balanced" compromise such as a 50-50 split. In order to capture information provided by the model about the degree to
which an agreement is balance, the variable Balanced Compromise multiplies
Compromise by a measure of closeness to a 50-50 split (0 at a 100%-0% split and 1 at a
50%-50% split). In all cases, the two variables move in the same direction in response to
the same independent variables: there appears to be no trade-off between achieving a
compromise at all and achieving a balanced compromise. Since Balanced Compromise
changes more dramatically in response to changes in independent variables, it is used to
determine the implications of those changes for the compromise – surrender destruction
continuum.

Second, one may ask whether the war ends though agreement (even surrender) or
through the destruction of one side on the battlefield. That is, does negotiation or
continued war prevail? In order to assess the implications of changes in independent
variables on the manner in which the war ends, the variable Agreed End assumes the
value of 0 in all cases except NEGOC (when it is coded as 1) and mixed-strategy
equilibria (when it is coded as the probability of NEGOC). This variable does not
change in the same manner as Compromise and Balanced Compromise. In fact, the
effects of changes in some parameters are opposite – sometimes, what makes Balanced
Compromise more likely also makes Agreed End less likely.

Third, given that a war does not end in compromise, who wins? If the model predicts
surrender, then one side is predicted to win with 100% probability. However, if the
model predicts continued war, then the answer is probabilistic and given by the
combination of combat model and the force ratio between the sides. This calculation is
given by the variable Winner, which can assume four values: mutual cooperation (a case
of no winner). military stalemate (assumed if no winner in the first 10 time periods, also a case of no winner)\(^{40}\), government win (including a rebel surrender) and rebel win (including a government surrender). The first two probabilities may be combined as "no winner." While the theory includes an infinite number of periods and therefore makes a stalemate impossible over the infinitely-long run, the probability that given continuing warfare neither side would prevail for a very long time is an interesting quantity. This is so because actual wars do sometimes seem to reach a deadlock and end with a gradual reduction in combat. Including the possibility of stalemate does not alter the relative probability of government vs. rebel victory and so does not change the implications of the theory for who wins, only whether there is a winner at all.

Fourth, how long does the war last? Since this theory assumes that negotiation occurs immediately and that if the war continues no further attempts at negotiation will be made, its applicability to the question of war duration is limited. However, one theoretically interesting indicator of duration is generated by the model – the probability that the war ends in the first time period, whether through negotiation or military victory. Quick End assumes a value of one when the game outcome is \(\text{NEGOC}_c\). Other \(\text{NEGOC}\) outcomes produce a value of zero (the probability of war the next period is 100\% since neither side can be eliminated during a pause in the fighting). Otherwise, it is \(q_0^4+(1-q_0)^4\). This value

\(^{40}\) This definition of stalemate in a fight to the finish is drawn from Wagner (2000), who argues that stalemate is simply a fight that is expected to last for an arbitrarily long time. Another way of approaching this issue is to think of the theory being tested as that which is formally implemented in program code. While the “pure” theory has infinite time periods, the theory formalized in computer code does not. It is ultimately the theory as expressed in code that is being evaluated, for it is this formalization that generates the implications.
represents how likely a war is to end within one period; it does not represent the expected duration of wars after that point (which vary according to specific combat model).

The following implications have been derived by examining the theoretical relationship of parameters to the above dependent variables. Since each was derived in the same manner, the derivation of only the first implication for each dependent variable is detailed. Implications are bivariate relationships unless there is a prior theoretical reason to examine a particular combination of variables and parameters. The exception to this is that all implications must be invariant to the particular combat model used. Every implication holds regardless of which combat model holds. Implications that are overly complex or involve unclear relationships are not presented, for the existing list already contains many interesting propositions.

3.2.1 COMPROMISE

Force Ratio

• Implication C1: Compromise is more probable when the rebels hold a military advantage of 2:1 or greater than when the government holds a military advantage of 2:1 or greater.
The average shape of the predicted force ratio-probability of compromise relationship is shown by Figure 3.1.\textsuperscript{41} Though the relationship between force ratio and compromise is not entirely linear, it is monotonic. This alone suggests that an implication of the theory is that a more powerful government (increase in force ratio) means a lower chance of compromise.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure3.1}
\caption{Force Ratio and Probability of Compromise}
\end{figure}

However, this apparently monotonic relationship is not consistent across combat models, as shown by Figure 3.2. Note that figures represent model expectations, not

\textsuperscript{41} Note that while figures generally use septiles for clarity, each implication has been derived using the full range of values it can assume. This is particularly important to identify implications about particular "special" values of independent variables and parameters (the complete absence of a security dilemma, for example).
relationships between empirically-measured variables. The "data" used to build these graphs is the equilibria of the CWTG generated by my software program. Each combat model has an area in which the relationship is not monotonic. Therefore, the implication has been rephrased to accommodate possible differences by combat model: regardless of combat model, a high value of force ratio means that compromise is less likely than low values of force ratio.

- Hypothesis 1: *Compromise* is more probable if $\text{force ratio} < .333$ than if $\text{force ratio} > .667$.\(^{42}\)

**Figure 3.2 Effect of Combat Model on Force Ratio - Compromise Relationship**

\(^{42}\) I opt to present hypotheses in this chapter, where their connections to implications can be more readily discerned. Measurement issues are examined in Chapter 4, but
An interesting implication of Figure 3.1, however, is that analysis using a logit model should find that increasing force ratio decreases the probability of compromise. I performed a logit analysis on the equilibria of the CWTG using the parameter q as the independent variable and predicted compromise as the dependent variable: the results confirm that even though the relationship between force ratio and compromise is not monotonic, it should appear to be significant and negative in a logit model.

Costs and Expected Costs

- Implication C2: All else being equal, higher prior or expected costs suffered by the rebels increase the probability of compromise.

- Implication C3: All else being equal, higher prior or expected costs suffered by the government increase the probability of compromise.

Expected costs are simply the sum of costs a side expects to suffer given a fight to the finish, discounted for time. In this case, that means the costs that would be suffered over ten periods of war. As for prior costs, this simply means that as $C_{r1}$ increases for a side, the probability of compromise increases. These are simple bivariate relationships that hold across all combat models. This suggests the following two hypotheses regarding increases in $C_{r1}$:

- Hypothesis 2: *Higher rates of prior rebel costs increase the probability of compromise.*
• Hypothesis 3: Higher rates of prior government costs increase the probability of compromise.

If Implications C2 and C3 are correct, they suggest that examining total war costs for the participants may not reveal much of a relationship at all. This is because when costs are expected to be high, the parties get out of the war before those costs can come to pass. Therefore, the wars that get fought to a finish may actually have higher costs than those brought to an end by compromise, for the act of compromise censors observable costs. The actual observed relationship may thus be positive, negative, or nonexistent depending on the degree of error in expectations of war costs and combat outcomes. However, since prior costs are by their nature observable, there should be no such "selection effect" to obscure Hypotheses 2 and 3.

• Implication C4: Compromise is more likely when both sides' prior or expected costs are high than any other combination of costs.\(^{43}\)

• Implication C5: Compromise is less likely when both sides' prior or expected costs are low than any other combination of costs.

The cost terms in the CWTG have minimum and maximum values over a given number of periods. Therefore, to speak of costs being near their maximum has theoretical

\(^{43}\) Throughout these implications, I use the terms low, medium and high to refer to the lower, middle, and upper thirds of a variable's range, respectively.
meaning. Observable costs, however, probably have no obvious maximum level, so a less general statement is needed. It is always the case that if both sides’ costs are identical, then an increase in the value of the cost parameters increases the probability that compromise is the equilibrium to the CWTG. Translating this more limited statement to an empirically testable hypothesis is possible.

Let $\text{Similarity}_{\text{cost}} =$

$$1 - \frac{|\text{prior government cost rate} - \text{prior rebel cost rate}|}{|\text{prior government cost rate} - \text{prior rebel cost rate}|}$$

$\text{Similarity}_{\text{cost}}$ will be 1 when both sides’ prior cost rates are identical and will grow smaller as their prior cost rates diverge. Therefore the term $(\text{Similarity}_{\text{cost}}^W \cdot |\text{prior rebel cost rate} + \text{prior government cost rate}|)$ can be used to indicate the $\text{prior joint cost rate}$, where $W$ indicates the weight of “jointness” relative to costs. Since the CWTG implies that a high $\text{prior joint cost rate}$ makes compromise more likely and a low $\text{prior joint cost rate}$ makes compromise less likely, it is implied given the empirical definitions that as the $\text{prior joint cost rate}$ increases, the probability of compromise also increases:

- Hypothesis 4: Higher $\text{prior joint cost rates}$ increase the probability of compromise.

- Implication C6: Compromise is more likely if the rebels’ prior costs are high and the government’s prior costs are low than if the government’s prior costs are high and the rebels’ prior costs are low.

Implication C6 suggests that when the rebels have been suffering costs at a greater rate than the government, compromise is more likely. Table 3.3 summarizes the effect of
prior costs (C1) on the probability of compromise, given Implications C4, C5, and C6.

No hypotheses are presented from this implication.

Table 3.3 Simultaneous Effect of Government and Rebel Prior Costs on Probability of Compromise

<table>
<thead>
<tr>
<th>Low Prior Government Costs</th>
<th>Low Prior Rebel Costs</th>
<th>High Prior Rebel Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Prior Government Costs</td>
<td>Lowest</td>
<td>Moderate to High</td>
</tr>
<tr>
<td>High Prior Government Costs</td>
<td>Low to Moderate</td>
<td>Highest</td>
</tr>
</tbody>
</table>

- Implication C7: Compromise is more likely if the government's expected costs are high and the rebels' expected costs are low than if the rebels' expected costs are high and the government's expected costs are low.

Interestingly, the costs each side expects to suffer from a fight to the finish are related to the probability of compromise in a different manner than prior costs. Table 3.4 summarizes this relationship, given Implications C4, C5, and C7. Because expected costs are unobservable, no hypotheses follow from this implication.

Table 3.4 Simultaneous Effect of Government and Rebel Expected Costs on Probability of Compromise

<table>
<thead>
<tr>
<th>Low Expected Government costs</th>
<th>Low Expected Rebel Costs</th>
<th>High Expected Rebel Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Expected Government costs</td>
<td>Lowest</td>
<td>Low to Moderate</td>
</tr>
<tr>
<td>High Expected Government costs</td>
<td>Moderate to High</td>
<td>Highest</td>
</tr>
</tbody>
</table>
Defection Advantage

Since the defection advantage is constrained by the force ratio between the two sides - it can be larger when the two sides are balanced than when one side holds a military edge - implications involving the defection advantage are related to those involving force ratio. Defection advantage is examined in two forms: the actual parameter value used in the analysis, and the advantage that parameter represents as a percentage of the maximum possible advantage given the existing force ratio. This percentage represents all of the considerations aside from the existing military balance that might lead the sides to expect that defecting from an agreement will yield advantages on the battlefield. Both of these variables are examined, and each yields a somewhat surprising result: though this theory concurs with the oft-stated claim that peace would be easier to achieve if there were no security dilemma (no advantage to reneging on an agreement), it is not necessarily true that if a security dilemma exists, reducing its magnitude will assist the peace process. Moreover, the mere existence of a security dilemma need not preclude a negotiated compromise from being reached.

Figures 3.3 and 3.4 demonstrate that the relationship between defection advantage and compromise may not be monotonic after the initial move from no advantage to some advantage. In other words both imply that in some situations, events or beliefs that actually worsen the security dilemma by increasing the incentive to renge on a negotiated settlement can increase the probability of a successful compromise. Both approaches find unique benefits to the absence of any defection advantage, though they
also differ in several ways. Figure 3.3 implies that at the highest values of defection advantage, where reneging on an agreement virtually ensures military victory, compromise is indeed impossible. Figure 3.4 reveals that this phenomenon is tied to the constraints on the defection advantage imposed by the force ratio between the sides rather than other factors. However, the relationship remains non-monotonic in Figure 3.4, which is interesting— if the sides have some minor incentive to exploit the other player, they are less likely to compromise than if they have sizeable incentives to exploit.

Figure 3.3 Defection Advantage and Compromise

![Graph showing the relationship between deflection advantage parameter and mean compromise.]

**Defection Advantage Parameter (Min = 1, Max = 2)**

---

44 This is possibly a selection effect that results from the fact that the defection advantage is highest under conditions of parity.
Figure 3.4 Degree of Possible Defection Advantage and Compromise

- Implication C8: As the advantage to defection moves from no defection advantage to low values of defection advantage, the probability of compromise decreases.
- Implication C9: Compromise is more likely at moderate values of defection advantage than at low but nonzero values of defection advantage.
- Implication C10: Compromise never occurs when the defection advantage is sufficient to ensure nearly-certain victory to whichever side defects (parameter values of 1.9 and above).
A parameter value of 1.9 or above means that given military parity (near-parity being a necessary condition for such a high value of defection advantage to exist), the ratio of a unilateral defector’s forces to those of its opponent will jump from a ratio of 1:1 to a ratio of at least 19:1. Expressed differently, defection increases the defector’s chance of winning in the next period of combat from about 6% to at least 81%. This degree of incentive to defect transforms the post-agreement subgame into a prisoners’ dilemma, making compromise impossible.

Discounting

Implication C11: Compromise is more likely at moderate values of discount (medium-term thinking) than at low levels of discount (short-term thinking).

Interestingly, the effect of increases in the discount parameter (lengthening the shadow of the future) differ depending on which combat model most accurately represents the actual manner in which force ratios change over time. Figure 3.5 illustrates that in models in which the military situation tends to move towards parity over time (models 1 and 2), long-term thinking increases the probability of compromise. However, in models in which the larger side keeps on getting larger and the smaller side keeps getting smaller, long-term thinking actually reduces the probability of a compromise between the parties.
Expected Utility for War

Some of the more interesting implications of the theory are the results of changes in each side’s expected utility for rejecting an agreement and continuing the war.

- Implication C12: Compromise is more likely when the government’s expected utility for war is low and the rebels’ utility for war is high than any other combination of utilities.
• Implication C13: Compromise is more likely if both the government and the rebels have low expected utility for war than if the government has high expected utility for war and the rebels have low expected utility for war.

• Implication C14: Compromise is more likely if both the government and the rebels have high expected utility for war than if the government has high expected utility for war and the rebels have low expected utility for war.

These implications are summarized in Table 3.5. They suggest that if one has the choice to make war seem unattractive to one side, lowering the government’s expected utility for war makes compromise more likely while lowering the rebel’s expected utility for war makes compromise less likely. As one might expect given the asymmetric nature of the bargaining game, the government has strong incentives to cut a deal when it fears war and knows that its opponent is not opposed to war while the rebels do not always have this option.

<table>
<thead>
<tr>
<th></th>
<th>Rebels have low expected utility for a fight to the finish</th>
<th>Rebels have high expected utility for a fight to the finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government has low expected utility for a fight to the finish</td>
<td>Moderate</td>
<td>Highest</td>
</tr>
<tr>
<td>Government has high expected utility for a fight to the finish</td>
<td>Lowest</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Table 3.5 Simultaneous Effect of $U^G(\text{FIGHT})$ and $U^R(\text{FIGHT})$ on Probability of Compromise
3.2.2 AGREED END

These implications were derived in exactly the same manner as the implications regarding compromise. For the dependent variable of agreement to end the war is like compromise a single probability of a dichotomous outcome. Just as compromise either exists or it doesn’t with some probability, so does agreement to end the war.

**Force Ratio**

- Implication A1: Agreement to end the war is more likely as the force ratio between the government and the rebels approaches parity.

If *parity* is defined as \[ 1 - 2 \cdot |.5 - \text{force ratio}| \] then *parity* will range from near zero when one side is dominant to one when the two sides are exactly evenly matched. This being the case. Implication A1 supports the following hypothesis:

- Hypothesis 5: *Parity* increases the probability of *agreement to end the war*.

**Costs and Expected Costs**

- Implication A2: High prior costs suffered by both the government and the rebels make agreement to end the war more likely than any other combination of prior costs.

- Implication A3: When one side’s prior costs are high and the other’s are low, agreement to end the war is more likely than if both side’s prior costs are low.
Table 3.6 illustrates the relationship of the prior rate of costs to the probability an agreement ends the war. In general, higher rates of combined prior costs mean that agreement to end the war is more likely.

<table>
<thead>
<tr>
<th>Low Prior Government Costs</th>
<th>Low Prior Rebel Costs</th>
<th>High Prior Rebel Costs</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest</td>
<td>Low Prior Rebel Costs</td>
<td>High Prior Rebel Costs</td>
<td>Moderate</td>
</tr>
<tr>
<td>Moderate</td>
<td>High Prior Government Costs</td>
<td>Moderate</td>
<td>Highest</td>
</tr>
</tbody>
</table>

In this case, translating the implications to a testable hypothesis does not require distinguishing between the costs suffered by each side:

- Hypothesis 6: Higher rates of *combined prior costs* increase the probability of *agreement to end the war*.

- Implication A4: All else being equal, increasing the expected costs of the government increases the probability of agreement to end the war.

- Implication A5: All else being equal, increasing the expected costs of the rebels increases the probability of agreement to end the war.

- Implication A6: High expected costs by both the government and the rebels makes agreement to end the war more likely than any other combination of expected costs.

- Implication A7: When one side’s expected costs are high and the other’s is low, agreement to end the war is more likely than when both side’s expected costs are low.
This set of implications is outlined in Table 3.7: it produces no additional hypotheses because of the unobservable (censored) nature of expected costs.

**Table 3.7 Simultaneous Effect of Government and Rebel Expected Costs on Probability of Agreement to End the War**

<table>
<thead>
<tr>
<th></th>
<th>Low Expected Rebel Costs</th>
<th>High Expected Rebel Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Expected Government costs</td>
<td>Lowest</td>
<td>Moderate</td>
</tr>
<tr>
<td>High Expected Government costs</td>
<td>Moderate</td>
<td>Highest</td>
</tr>
</tbody>
</table>

*Defection Advantage*

- Implication A8: As the defection advantage increases, agreement to end the war becomes less likely.

This is rather unsurprising – the sides are less likely to reach agreement if neither one expects the other to abide by its terms. This is the general argument advanced for the role of the security dilemma in civil wars. What is interesting, however, is that while increasing incentives to exploit the opponent decreases the likelihood of agreement, it does not decrease the likelihood of compromise. In short, if the security dilemma is not defined as a prisoners’ dilemma, the difficulty of reaching an agreement need not translate into difficulty reaching a compromise.

- Implication A9: As the defection advantage increases from low to moderate values, the marginal effect of further increases on the probability of agreement to end the war decreases.
The pessimistic conclusion one might reach from this implication is that if incentives to defect are very strong, even a substantial reduction in those incentives may not make it very much easier for the sides to reach agreement.

**Discounting**

- Implication A10: As the discount parameter increases from low levels to about .85 (more long-term thinking), agreement becomes more likely.

  The point at which half of the overall utility is captured by examining the first ten periods alone is about .85 (see Table 2.3). As in some of the models in Figure 3.5, a longer shadow of the future after this point can decrease the probability of agreement to end the war. In this case, the decrease is implied regardless of which combat model is correct. If the process of combat is believed to ensure eventual victory (or defeat), an actor very concerned with the situation far in the future (or the actor's opponent) may be reluctant to make any concession, patiently allowing the war to take its course. It should be noted that this decrease in the probability of an agreed upon end to the war is small compared to the changes wrought by increasing the discount parameter to .85.

- Implication A11: As the discount parameter increases from .85 to its maximum, the probability of agreement to end the war decreases.

Perhaps some leaders who take a very long-term view of things expect to win over the long run and are therefore unwilling to stop fighting or make concessions in the short run.
It is also possible that for very far-sighted leaders, the benefits of a pause in the fighting pale in comparison to the other costs and benefits they evaluate.

*Expected Utility for War*

- Implication A12: If both sides' expected utility for war is high or both sides' expected utility for war is low, agreement to end the war is more likely than if one side's expected utility for war is high and the other's is low.

Table 3.8 summarizes this implication. It appears that a degree of symmetry in expectations about the outcome and costs of a fight to the finish is an important determinant of whether a war will end by mutual agreement. What is most interesting is that this implication emerged and yet it is not the case that agreement to end the war (that is, \(\text{NEGOC} \)) is a more common equilibrium of the game when both sides fear war.

<table>
<thead>
<tr>
<th></th>
<th>Rebels have low expected utility for a fight to the finish</th>
<th>Rebels have high expected utility for a fight to the finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government has low expected utility for a fight to the finish</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>Government has high expected utility for a fight to the finish</td>
<td>Lower</td>
<td>Higher</td>
</tr>
</tbody>
</table>

Table 3.8  Simultaneous Effect of \(U^G(\text{FIGHT})\) and \(U^R(\text{FIGHT})\) on Probability of Compromise
3.2.3 WINNER

Force Ratio

Since winner is not a dichotomous outcome, a slightly different method of derivation is used to determine the implications of changes in parameters and independent variables on the winner of the war. The probability of each possible value of Winner is examined separately but simultaneously with the probability of each other value. Figure 3.6 graphically presents a simple analysis of the theoretical effect of increasing the relative military power of the government on each possible outcome of "Winner."

Figure 3.6 Effects of Force Ratio on Winner

![Bar chart showing the effects of force ratio on winner outcomes.](chart.png)
• Implication W1: As the force ratio of government to rebel military power increases, the government is more likely to win the war.

Figure 3.7 examines the relationship between force ratio and the probability the government wins across each model of combat — the relationship's functional form varies across combat models, but it is monotonic under all of them.

Figure 3.7 Stronger Government More Likely To Win: Invariance to Combat Model

Having survived examination by combat model, one can use this relationship to put forward a hypothesis:

• Hypothesis 7: A higher force ratio increases the probability of a government win.
• Implication W2: As the force ratio of government to rebel military power increases, the rebels are less likely to win the war.

Again, this relationship has been tested for monotonicity and invariance to combat model and produces a hypothesis.

• Hypothesis 8: A lower force ratio increases the probability of a rebel win.

• Implication W3: As the force ratio between the government and the rebels approaches parity, military stalemate is more likely.\(^\text{45}\)

This implication is obvious from Figure 3.6 and seems reasonable, though it is interesting that even knowing that the outcome will be stalemate, the two sides still choose to keep fighting rather than bargain.

• Hypothesis 9: Parity increases the probability of stalemate.

• Implication W4: As the force ratio of government to rebel military power increases, the probability of no winner decreases.

A strong government seems conducive to one outcome only – military victory by the government (whether through winning a fight to the finish or through convincing the rebels to surrender). This also produces a hypothesis.

• Hypothesis 10: A lower force ratio increases the probability of no winner.

\(^{45}\) Stalemate is very rare under model 4 and nonexistent under model 5, both of which assume a general tendency for the military situation to move away from parity as the larger side gets even larger. Those cases of stalemate in model 4 occur only under near-parity. A large enough number of random cases would eventually generate a stalemate even under model 5: this outcome is mathematically most likely at parity.
Implications W1 through W4 suggest simultaneous change in variables, allowing an additional hypothesis to be constructed.

- Hypothesis 11: As the force ratio increases, the probability of rebel win decreases, the probability of no winner decreases, and the probability of a government win increases.

Costs and Expected Costs

- Implication W5: Increasing prior costs of the government from low to moderate levels increases the probability of no winner, all else being equal.
- Implication W6: Increasing prior costs of the rebels from low to moderate levels increases the probability of no winner, all else being equal.

An interesting implication of the theory is that with respect to some civil war outcomes, there may be diminishing returns to costs. While no relationship is apparent from increasing $C_{i1}^G$ or $C_{i1}^R$ beyond about .4, the initial increase from 0 to .4 increases the probability of settlement. This suggests that if one wanted to avoid a military victory by either party in a particularly intense civil war, the usual path of increasing the costs of fighting is unlikely to prove successful. This is a useful caveat to a common objection to humanitarian efforts in war-torn areas, that decreasing the costs of war makes it easier to continue fighting. The warning is valid for some wars but likely to be less valid for the worst ones. Again, however, the lack of a clear scale for what constitutes "moderate to
"high" costs in the real world makes it difficult to transform these implications into testable hypotheses – it may be the case that no civil war has come close to the equivalent of $C_{i*} > .4$.

- Implication W7: Higher expected rates of change in rebel costs increase the probability that the government wins.

This is one of the few cases where one of the K parameters has a clear effect on war outcomes. It is possible that $K^K$ is most likely to be positive when the government is still mobilizing, so that the absolute number of troops fighting the war (and therefore, presumably, the number of casualties and destructiveness of battles) is expected to increase dramatically. The difference between this implication and the two that follow is that this implication is blind to the expected duration of war. That is, it may be the case that even though the rate of costs is expected to increase, the total of expected costs is expected to decrease or remain the same because the rebels expect to win sooner under such changed conditions. What is most surprising about this implication is that the model does not connect costs to the probability of a military win by a side given a fight to the finish. That is, the combat models do not connect costs suffered to changes in military strength. This implication, therefore, must either be the result of one or both sides choosing to fight more often or the rebels choosing to accept a demand to surrender more often. The latter is most likely the case.
• Implication W8: Increases in expected government costs increase the probability of no winner.

• Implication W9: Increases in expected government costs decrease the probability of a rebel win.

• Implication W10: When expected rebel costs are high, the probability of a government win is more likely than when expected rebel costs are low.

• Implication W11: As expected costs of the rebels and government jointly increase, the government is more likely to win.

• Implication W12: As expected costs of the rebels and government jointly increase, the rebels are less likely to win.

• Implication W13: As expected costs of the rebels and government jointly increase, the probability of no winner increases.

This set of implications contains both intuitive and counterintuitive relationships. Implications W8 and W13 are not surprising, as increasing expected costs should decrease the utility of continued war, all else being equal. That government costs matter more than rebel costs is also unremarkable given the asymmetric structure of the bargaining game. As Implication W10 establishes, high expected costs for the rebels make it easier for the government to convince them to surrender. This explanation makes it easier to understand Implications W11 through W13 – if both sides' expected utility for fighting goes down, two things should happen. First, the range of acceptable agreements should expand, making it easier for the sides to compromise and/or the government to
convince the rebels to surrender. If both of these probabilities increase, then the probability the rebels win should decrease. Second, the incentives to defect become relatively less important, because gaining a military edge only partially offsets the expected costs of fighting. It does nothing to change the rate of costs suffered by both sides: instead, it may make it easier for one side to win quickly, which may reduce total costs.

There are two caveats to this sensible story. First, expected costs may increase for a number of reasons. One thing that will increase total expected costs is if the sides expect a war to last a long time. Since this is the case, it is more likely that if for some reason continued warfare is chosen by a side then that war will end in a stalemate. After all, a stalemate has been defined as a war that does not end by the last time period evaluated. Second, Implication W9 is highly counterintuitive. If for some reason, the government expects the total costs of fighting a war to increase, the rebels actually become less likely to win. This appears to be due to the government's ability to make proposals, for higher expected costs for itself mean that it will have an incentive to make concession in order to avoid war. Moreover, its offer gains some amount of credibility from the fact that resumption of war is, on balance, more harmful to itself when its expected costs are higher. So it is not the case that increasing expected costs of the government harms the rebels in any way – instead, it makes it more likely that they will get more of what they want without having to fight for it. No testable hypotheses follow from these implications.
Defection Advantage

- Implication W14: Increases in the defection advantage increase the probability of stalemate.
- Implication W15: As the defection advantage moves from zero to some positive value, the probability of no winner decreases.

As the security dilemma intensifies, continued war becomes more likely because offers become less credible. Since stalemate can only occur if the sides fight, it is not surprising that it becomes more likely as the defection advantage increases. In addition, the defection advantage is more likely to be high when the sides are evenly matched, the military situation most likely to produce a stalemate. Moving from no security dilemma to a situation in which one exists decreases the probability of compromise more than it increases the probability of stalemate, so it becomes more likely that one side or other will win the war.

Discounting

- Implication W16: As the discount parameter increases to about .85 (more long-term thinking) the probability of a rebel win decreases.
- Implication W17: As the discount parameter increases to about .85 (more long-term thinking) the probability of no winner increases.

This is similar to Implication A10 – if agreements become more likely as the sides begin to view things over a longer term, then the rebels become less likely to win (because the
government becomes more likely to find an offer they will accept) and the probability of no winner therefore increases.

3.2.4 IMPLICATIONS REGARDING WAR ENDS

As this variable is dichotomous, the same methods were used to generate implications regarding it that were used to generate those regarding compromise and agreed end to the war.

*Force Ratio*

Implication E1: As the force ratio between the sides approaches parity, a quick end to the war becomes less likely.

Parity creates incentives to agree because it increases the total costs of war relative to a particular agreement. However, it also works against agreement by intensifying the security dilemma. The result is that agreements do on balance become more likely (see Implication A1), but not so likely as to outweigh the effects of parity within the realm of warfare. Parity makes it unlikely that a war, if fought, will end in the first time period.

- Hypothesis 12: Parity decreases the probability of a quick end to the war.
*Costs and Expected Costs*

- Implication E2: All else being equal, increasing the expected rate of change in government costs increases the probability of a quick end to the war when its rate of future costs is already expected to remain the same or increase.

- Implication E3: All else being equal, increasing the expected rate of change in rebel costs increases the probability of a quick end to the war when its rate of future costs is already expected to remain the same or increase.

These heavily qualified implications stem from an interesting predicted relationship. When K parameters are zero or greater, increases in those parameters increase the likelihood that the war ends within one time period. Since K does not affect the probability of a military victory by either side this must be because the sides are choosing to exit the war. If either side expects fighting to become more costly over time, they are more likely to seek an exit from the war. However, it is not as clear that if the sides expect costs to decline over time, a slower rate of decline makes it more likely for them to choose to end the war. The relationship in this case is far more dependent on the value of prior costs than on changes in the K parameters.

- Implication E4: When both the expected costs of the government and the rebels are high, a quick end to the war is more likely than if both are low.
Increasing the duration of a war increases expected costs, so this implication must mean that the increases in agreement from increased costs outweigh the fact that strictly military factors are less likely to end the war in one time period. If one wants a quick end to a war, convincing both sides that the costs of fighting are going to increase would seem to be an appropriate manipulation.

\textit{Defection Advantage}

- Implication E5: Increases in the defection advantage decrease the probability of a quick end to the war.

This is wholly unsurprising since a successful agreement ends the war while one that collapses due to defection prolongs the war by at least one period. In other words, a war ends quickly with probability 1 given successful compromise, with probability $q^t - (1-q)^t$ given FIGHT outcomes, and with probability 0 given an agreement that collapses. This being the case, a more intense security dilemma shifts outcomes from the first of these to either the second or the third and can therefore only decrease the likelihood of a quick end.

\textit{Discounting}

- Implication E6: As the discount parameter increases (more long-term thinking), a quick end to the war becomes more likely.
Two things happen if the sides think more about the long term. First, the advantage of agreement relative to fighting can increase, because the absolute difference between the utility of each increases. Second, a war that is expected to be quick and decisive becomes more attractive, because paying a time period of costs now to avoid giving up some resource control over the long run looks like a better investment. Both of these factors seem to contribute to this implication.

**Expected Utility for War**

- Implication E7: When one side has high expected utility for war and the other side has low expected utility for war, a quick end to the war is more likely than when both sides have low expected utility for war or when both sides have high expected utility for war.

Table 3.9 illustrates this finding, which is surprising given the implications regarding compromise (see Table 3.8). Perhaps this is simply capturing the fact that \( q^1 - (1-q)^1 \) becomes larger as the force ratio becomes more disparate, so that if war is chosen, it is more likely to end quickly. It is still odd that the conditions most likely to produce compromise are also likely to prolong the war past the first period – this suggests an interesting dilemma for those who hold a normative preference for compromise over decisive military victories. If casualties in war are related to its duration, which seems

---

46 Bloomfield epitomizes this viewpoint, describing decisive victory as “morally repugnant” (1997, 725) and stating that: “A compelling reason to keep working at conflict research is to try to change the proportion of wars that proceed as far as to military victory as compared to negotiated settlements” (709). This argument presupposes that military victories take longer than negotiated settlements, when
likely, then perhaps manipulating the parameters of the conflict to make compromise more likely will at the same time make it more deadly by prolonging the time it takes for either side to win if compromise does fail.

Table 3.9 Simultaneous Effect of \( U^G(\text{FIGHT}) \) and \( U^R(\text{FIGHT}) \) on Probability of Quick End

<table>
<thead>
<tr>
<th></th>
<th>Rebels have low expected utility for a fight to the finish</th>
<th>Rebels have high expected utility for a fight to the finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government has low expected utility for a fight to the finish</td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td>Government has high expected utility for a fight to the finish</td>
<td>Higher</td>
<td>Lower</td>
</tr>
</tbody>
</table>

3.3 IMPLICATIONS OF EXTERNAL INTERVENTION

How might an external actor manipulate the parameters of the model to change the outcome of civil wars? I proceed through each of the parameters in the model to examine this question. It should be noted that for the sake of simplicity, external actors are not represented as strategic actors in the theory. This means that phenomena such as the "deterrence" of third party intervention by making reasonable offers to one’s opponent (Werner 1999) cannot be represented within the CWTG.\(^7\) In addition, I do not consider

---

Implication E7 indicates that a decisive victory may occur more quickly than a compromise, given that a compromise carries some risk or breakdown due to the security dilemma.\(^7\) Indeed, in the 1830 revolt against the French monarchy, the Liberals prevailed in fighting but then adopted a compromise with the King because they feared that other countries would invade France if the revolution were too successful (Pilbeam 1995). Similarly, the Guatemalan army fighting an exile invasion in 1954 feared that if it crushed the rebels, the United States would intervene militarily. Within days the military ousted the President and invited the rebels to form a government (Cullather 1999. 97).
the possibility that an external actor might alter the structure of the game: for example, perhaps an outside party by recognizing the rebels and acting as a representative for them may equalize the bargaining situation enough so that it would make sense to model the rebels as having a proposal power. Perhaps even intervention on behalf of the government might serve to legitimize the rebels in some way. Such an effect is simply outside the scope of this analysis. Nevertheless, a number of insights regarding intervention and mediation are suggested by the theory.

3.3.1 DISCOUNTING AND EXTERNAL ACTORS

The d parameter has been conceptualized as the degree of long-term thinking by a party, but of course what it really captures is simply a differential weighting of utility across time – earlier periods matter more than later ones. What might alter this weighting? I briefly address three possibilities.

First, if the parties expect that the war will generate foreign aid, either in the form of humanitarian assistance or in the form of reconstruction assistance, the absolute value of the stream of resources should be higher. The theory keeps this value constant at 1, but

---

48 Srahke and Noble argue that “As long as the nation state is the accepted norm – and principal actor – of the international system, a “domestic” conflict that even implicitly questions that norm and the nature of that actor ceases to be purely “domestic” and automatically acquires international dimension” (1977, 5). Pruitt and Carnevale (1993) suggested that mediation facilitates communication between the parties. Their explanation for “emergent” mediation relies on the notion of difficult negotiation, arguing that third parties may lower the risk of communication for each party. If true, perhaps this works both ways. There are cases when governments refuse offers of intervention. Russia refused a Prussian offer to intervene against Polish insurgents in 1863 (Onacewicz 1985). It is unclear whether this was an effort to preserve its own legitimacy or whether it was simply a choice to keep Prussia’s hands off of Poland.
the same process can be represented by simply giving later time periods more weight than they would otherwise receive, and by reducing the expected costs of the war at the same time (since such assistance may or may not decrease costs in an absolute sense but surely decreases them in proportion to total utility). Dealing only with the first of these changes, the result should be an increase in the probability the war ends quickly, but an uncertain effect on how precisely this is accomplished. Whether compromise and agreement become less likely or more likely depends on the prior discount parameter.

Second, if a mediator provides better information to both sides it may be the case that the parties to the conflict, having less uncertainty about the future, will place more value on it. If this is true, then information provision regarding future costs and benefits of war and peace should make it more likely that the war ends quickly. Again, effects on other outcomes are unclear.

Finally, perhaps one reason a discount rate would be low instead of high is if each side's leadership believed it would soon be replaced. If the structure of each side is such that leaders didn't expect to be in power for very long, they would naturally value the short term more than the long term. External efforts to support the current leaders within each coalition may be able to increase the degree to which those leaders value the future, and thus make a quick end to the conflict more likely.

Naturally, all of these actions require equal implementation with both parties. for the model treats discounting as a feature of the war more than a feature of the sides. This concession to simplicity undermines the ability of the model to generate clear hypotheses regarding mediation's effect on the shadow of the future.
3.3.2 OUTSIDE ACTORS AND THE SECURITY DILEMMA

While the role of mediators and intervenors with respect to the security dilemma is covered in Chapter 1.1 briefly return to it in order to compare the implications of the CWTG with existing research. Bloomfield (1997) finds that a very common characteristic of successfully negotiated wars is that a great power indicated interest in the termination of hostilities and negotiation of a settlement.

It is clear that external actors are not necessary for compromise in the CWTG unless the defection advantage is 1.9 or greater. In other words, if a potential agreement is so vulnerable to exploitation that unilateral defection by one side would move it from near-parity to an advantage of almost 20:1 in military strength, then no cooperation is possible without some mechanism for reducing the sides' vulnerability. However, cooperation is quite possible right up to that point, so external intervention cannot be a necessary condition for compromise (as maintained by Walter 1997) unless one believes that all civil wars are characterized by such intense levels of insecurity.

Even if one does believe that defection advantages of greater than 1.9 apply in all civil wars, it remains to be established that external intervention is necessary to lower that defection advantage.40 Nothing in the CWTG can resolve the question of whether

---

40 The parties to the Second Lebanese civil war agreed to a settlement in October 1976 which provided for mutual disarmament under the protection of an Arab League peacekeeping force. Though the peacekeepers were promptly deployed, the disarmament deadline in December passed because each side still refused to disarm until its opponent had done so (O'Ballance 1998). This, of course, cuts against the sufficiency of external
agreements can be self-enforcing under such conditions. Naturally, if it is the case that
outside actors favor one side and so only reduce its insecurity and not that of its
opponent, the CWTG cannot predict the effects of the intervention.

3.3.3 COSTS AND THE MILITARY BALANCE: THE ROLE OF EXTERNAL
MILITARY INTERVENTION

The simplest way to conceive of intervention is as a simple addition of force to one
side that changes the overall ratio of forces between the government and rebels. This is
referred to as force addition, which can be understood as a simple shift in the force ratio
in favor of the side on whose behalf the intervenor enters the war. It is not necessarily
the case that an intervenor must actually send troops to alter the force ratio. For example,
in Spain's First Carlist War the rebels calculated their armed strength on February 27,
1834 as 15,500 men, but also listed, province by province, the size of the armed forces
that were willing to join them given enough money – 50,000 men in all for 41,000
dollars. Financial assistance from England was forthcoming and soon the rebels' ranks
swelled with the additional manpower (Bollaert 1870, 91-92). One of the best-known
19th-century interventions had an effect on the force ratio all out of proportion to the
number of intervenors. In 1827, a combined British-French-Russian fleet intervened to
guarantees rather than their necessity, but is still a limit on the extent to which outsiders
can resolve the security dilemma.

50 Military intervention itself can encompass many types of behavior. Duner's study of
military intervention in civil wars during the 1970s defined intervention as a collection of
different actions, including various forms of combat involvement, para-combat
involvement, and direct support. He includes provision of supplies or arms and
transportation, for example (1985, 14-20).
prevent the reinforcement of Turkish troops fighting Greek insurgents. While a series of mishaps may well have been responsible for the Battle of Navarino Bay on October 27 that destroyed much of the Ottoman fleet, the action itself was the result of a policy decision by the intervenors to shelter the creation of a Greek state. Furthermore, the loss of naval supremacy prevented the vastly superior Ottoman and Egyptian forces from being transported to the war zone, thus substantially evening the odds for the rebels. Historians generally agree that the intervention changed the outcome of the war - yet not a single foreign soldier set foot on Ottoman soil prior to the Russo-Turkish War (Dakin 1973a, 1973b).

The ultimate objective of the intervenor may be to end the war\textsuperscript{51}, to enable an ally to win, or even to cause the war to drag on indefinitely\textsuperscript{52} - the motives of the intervenor are not considered in this model. Thus, one characteristic of military intervention is to increase or decrease $q_{ij}$. One danger of this approach is that it involves the unstated assumption that all else is equal. It is possible that a side might react to intervention by a friendly power by reducing its own military efforts and allowing the intervenor to pay more of the costs of fighting. The model cannot account for this possibility because each side is assumed to put forward a military effort proportional to the resources it controls.

\textsuperscript{51} Regan (2000) assumes that this is the fundamental motive behind all intervention, and uses war termination to define intervention success.

\textsuperscript{52} A third party may want to prevent war termination in order to keep a state weak and divided. For example, Heraclides (1997) argues that French assistance to Biafra was meant to undermine Nigerian, and hence British, influence in West Africa.
A second characteristic of military intervention is to impose costs on one or both of the parties. In cases where intervention actually occurs, this can be modeled as a change in \( C_i \) for the relevant party. Cost imposition no doubt occurs in the ordinary course of military activity, and it is also possible to conceive of some interventions (bombardment of undefended cities, for example) that might do little to alter the actual military balance but would impose costs on war participants. There is undoubtedly a continuum of military actions that emphasize cost imposition vs. advances on the ground. Table 3.10 examines the predicted effects of an actual intervention on the outcome of a civil war, given the type of change it produces.

| Table 3.10 Implications of Military Intervention |
|-----------------------------------------------|-------------------------------------|-----------------|-----------------|-------------------------------------|
| Intervention Characteristic | Favors | Compromise | Winner | Quick End |
| Force Addition | Govt | If increases force ratio from 1:2 to 2:1, decreased compromise | Increased government win; if moves force ratio toward parity, increase stalemate | If moves force ratio toward parity, decreased quick end |
| Force Addition | Rebels | If decreases force ratio from 2:1 to 1:2, increased compromise | Increased rebel win; if moves force ratio toward parity, increased stalemate | If moves force ratio toward parity, decreased quick end |
| Cost Imposition | Govt | Increased compromise | Increased "no winner" | --------- |
| Cost Imposition | Rebels | Increased compromise | Increased "no winner", decreased rebel win | --------- |

For brevity, all cells simply refer to direction and variable. cell values are changes in probability.

53 Normally if costs are imposed on both parties this will be because there is more than one intervenor, with support split between the two sides.

54 An example of intervention that may not have altered costs but surely altered the force ratio was Zaire's deployment of infantry to Burundi's capital in 1972, which allowed the government to reallocate its own troops to the battlefield, where it quickly prevailed (Melady 1974, 14-15).
Obviously, the implications in Table 3.10 hold only if it is assumed that both sides expect intervention to continue regardless of whether one or both sides renge on an accord (that is, the intervenor will continue to support its ally even if the ally "plays dirty").

It may be possible for an intervenor to reduce the rate at which its ally suffers costs. During the 1893 revolt of the Brazilian Navy, the rebels were prevented from employing their chief weapon, bombardment of the capital, when American, British, Italian, French, and Portuguese naval commanders pledged to protect the city. No shots were fired, but unable to pursue their intended strategy, the rebels fled the area and were subsequently defeated (Calogeras 1939). Perhaps if troops were committed to battle by an intervenor, it could shield its ally from the most intense combat. In such a case, the effect would be to reduce the chances for compromise and increase to probability that one side or the other wins. If the rate of rebel costs was lowered, a rebel win would become more likely.

3.3.4 EXPECTED INTERVENTION: A CONUNDRUM

Intervenors may also make threats. Because credibility is crucial to the evaluation of such threats, and because this model contains no role for credibility of threats. I will address expectations only briefly. Expected intervention may increase the expected rate of change in costs suffered by one or both* parties (increasing K) or change the

---

* An example of a threat to impose costs on both sides is an imminent invasion that threatens to overwhelm both sides. China's Communists and Nationalists managed to patch together an agreement to stop fighting each other in December 1936, as the threat of Japanese invasion loomed (Clodfelter 1991). In the 1835-1845 Farrapo revolt in Brazil, it was the imminent threat of an Argentine invasion that drove both parties to the
expectation of each side regarding the future force ratio. If the latter, the model cannot truly represent the situation, for it is entirely possible that a credible threat of sufficient intervention could cause the sides to believe that the smaller side will soon become the militarily stronger side, which violates the assumptions of the combat models in the theory. If the former, the effect will depend on which side's costs are expected to increase. If the rebels expect the rate at which they suffer costs to increase, they are more likely to surrender to the government. In addition, if the rebels already expected costs to increase over time or at least remain the same, the war is likely to end more quickly. If the threat of intervention raises \( K'' \) however, the only effect is to shorten the war if the government already expected the costs of war to remain stable or increase. The likelihood of a rebel win is not increased by the threat of intervention against the government. A second set of expectations follows from increasing the \( K \) parameter: namely, total expected costs of a fight to the finish go up. Table 3.11 summarizes the expected effects of a credible threat to impose costs on either or both sides.

---

bargaining table, where they agreed to the reincorporation of Rio Grande do Sul and a general amnesty (Calogeras 1939).
<table>
<thead>
<tr>
<th>Threat Favors</th>
<th>Compromise</th>
<th>Agreed End</th>
<th>Winner</th>
<th>Quick End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Govt</td>
<td>Increased compromise</td>
<td>Increased agreement</td>
<td>Increased government win: if joint, decreased rebel win and increased &quot;no winner&quot;</td>
<td>If cost rate already expected to remain same or increase, increased quick end. If moves expected costs from low to high, increased quick end.</td>
</tr>
<tr>
<td>Rebels</td>
<td>Increased compromise: more than pro-government threat</td>
<td>Increases probability of agreement</td>
<td>Decreases rebel win: Increases &quot;no winner:&quot; if joint, increased government win</td>
<td>If cost rate already expected to remain same or increase, increased quick end. If moves expected costs from low to high, increased quick end.</td>
</tr>
</tbody>
</table>

For brevity, all cells simply refer to direction and variable. Cells actually represent change in probability of given outcome.

### 3.4 SUMMARY

There are interesting implications of the CWTG for both civil war termination and the effects of external intervention on civil wars. There are also important limits to the theory, generally the result of simplifying choices made in theory construction. Under the CWTG, intervention’s observable effects are most likely to matter when an intervenor contributes troops to a side, for this increases that side’s military capabilities and may also increase the rate at which its opponent suffers costs.

In general, the implications suggest an intervenor might do well to consider the degree of parity inherent in the existing force ratio before making a decision to intervene. An
intervention with ground forces that aids one side, particularly the rebels, can indeed improve the odds of that side winning the war but if it brings the situation closer to parity it runs the risk of costly stalemate and a longer war. This suggests that if a quick end to war is desired, intervention with ground forces on behalf of the stronger side may be the most effective strategy.

If indeed compromise is normally a more "just" end to civil war than military victory by one side, a trade-off between justice and saving lives may exist. Chapter 5 evaluates hypotheses and examines the degree to which consideration of military intervention alters the support for those hypotheses. Before proceeding to tests, however, I turn to measurement and data collection.
Chapter 4

MEASUREMENT AND RESEARCH DESIGN

The civil war termination game (CWTG) generates a number of empirically testable hypotheses. To test these hypotheses, it is necessary to define the terms of substantive interest in an empirically observable fashion. Given definitions of each term as an observable variable, it is then necessary to measure these terms and construct a data set against which the hypotheses are to be tested. Finally, it is necessary to identify which analytical techniques are most appropriate for evaluating the accuracy of the hypotheses given the available data.

4.1 CIVIL WAR AS AN EMPIRICAL CONCEPT

The CWTG presumes the existence of a civil war, and therefore the civil war is the unit of analysis for this study. A civil war is a military conflict between a government and a rebel organization over control of the authoritative allocation of resources, characterized by coercion (the attempt to physically seize control), bargaining (the ability to divide control), and a security dilemma (existence of incentives to renege on agreements). I have assumed that civil wars are waged by organizations that can engage in bargaining, whether through direct negotiation or simply using the power of government to legislate potential agreements. The empirical referents in this definition are thus the existence of a conflict, the participation of a government, the participation of organized internal opposition, the possibility of coercion, and the existence of a security
dilemma. I address each of these empirical referents in turn, using them to construct an empirical definition of civil war.

The type of conflict presumed by the CWTG is one that places the authoritative allocation of resources at issue and imposes costs on the participants. In order to place the authoritative allocation of resources produced within a state's borders at issue, a conflict must occur within those borders. The fundamental unit of analysis for civil war must therefore be the territorial state. There are many types of conflict within state borders that impose costs, but the most observable of these should involve costs of such a magnitude as to be in some manner comparable to the benefits of controlling resource allocation. In particular, warfare kills, and therefore deaths must be of a high enough magnitude to distinguish between a process involving continuing costs and a mere outburst or random tragedy which does not involve the expectation of future costs.

Given that some threshold of deaths occurs from a military conflict within state borders, the next two empirical referents are the participation of a government and organized internal opposition. A government possesses the power of proposal in the CWTG, which is intended to capture the ability to use legislative organs to adopt policy and a sense of legitimacy stemming from international recognition and control over the state prior to the civil war. A government must therefore control the organs of governance, which can be empirically measured by physical control of the state's capital (or at least the locations, such as parliament buildings or presidential palaces, of the state's policy-making process) prior to the onset of civil war. In addition, a government must be the internationally recognized leader of an (also internationally recognized)
territorial state. Rebels are internal opposition to the government, organized and capable of inflicting costs on it. They must therefore be armed, have a leader or leaders, and engage in combat against the government. I therefore do not regard political opposition or "sympathizers" as rebels unless they take up arms against the government. Similarly, it is not the individual terrorist that concerns the CWTG but rather groups acting in concert. In order to distinguish such a group from an external invader, I require that rebels be both composed of and led by a state's own populace (or exiles therefrom).

The final two empirical referents in my definition of civil war are the process of coercion and existence of a security dilemma. The former assumes some doubt about the outcome of the violence while the latter assumes the inability of either side to either enforce compliance by its opponent or to credibly bind itself to future compliance. A civil war is therefore characterized by mutual effective resistance that effectively creates a situation of partial anarchy within a state's borders. This is not simply a matter of magnitude, but of ratio – empirically, each side must be militarily harming its opponent. This can be empirically established by observing the ability of each side to inflict casualties on its opponent.

The empirical definition of a civil war implied by the CWTG is thus continuing combat within a state's borders between an internationally recognized government and armed units composed of and led by internal opponents of that government, characterized by both a magnitude of violence sufficient to constitute war and a ratio of military effectiveness sufficient to place the outcome in doubt. Civil wars are therefore generally distinct from:
• most successful coups, massacres of civilians, or genocide, which fail the test of
  continuing military conflict.

• nonviolent protests, assassinations, isolated terrorist bombings, "nuisance-level"
  insurgencies, or organized criminal activity, which fail the test of magnitude of
  casualties.

• colonial wars, which fail the test of internality to an state's internationally recognized
  borders.

• intertribal fighting, intercommunal violence, or resistance to "puppet" governments
  which fail the test of participation by an internationally recognized government.

• interstate wars, which fail the test of rebel participation.

• spontaneous riots, which fail the test of organization, and

• conflicts so one-sided that a side is unable to meet some minimal ratio of the fatalities
  of its opponent to those suffered by itself.

The requirements of the empirical definition simply serve to connect the structure of the
CWTG to the observable process of civil war. Having defined civil war in these general
empirical terms, it is necessary to build a list of civil wars with which to test the
hypotheses.
4.2 CIVIL WAR: MEASUREMENT CONCERNS

The requirements of the above empirical description are very similar to those imposed by the definition of a civil war put forward by the Correlates of War (COW) Project. Other definitions of civil war exist: indeed, the COW civil war dataset is frequently cited by researchers but virtually never used without modification. However, after reviewing the alternatives I concluded that while the COW Project's data may not be perfect for this project, its definition is much closer to the terms of the CWTG than those of other datasets. It is therefore both expedient and theoretically valid to adopt the definition of civil war used by the COW researchers. In the terms of Cook and Campbell's (1979) discussion of quasi-experimentation, the "construct validity" (degree to which an

---

56 This is not a coincidence. The COW definition of civil war and civil war list informed this project from the beginning, and the CWTG was constructed with awareness of the general ideas of civil war embodied in the COW standards and a desire to explain the type of conflict captured by those standards.
57 Licklider's (1998) review of statistical findings on civil war termination laments the many different definitions and war lists used by scholars studying the subject. Some scholars use the COW list with their own modifications: Walter (1996, 1998) and Hartzell (1999) collapse a number of civil wars coded as multiple wars by COW while Mason and Fett (1996) and Regan (2000) begin with the COW definition but then relax or eliminate one or more of its central elements. Collier and Hoeffler (1998) combine some wars not coded as civil wars by COW with the standard COW list. Balch-Lindsay and Enterline (2000) and Licklider (1995) take a similar route, synthesizing the list of the COW Project with those from other sources and recoding many starting and ending dates. Sambanis (2000) combines data from several sources into a new database of civil war. Other scholars use the Chart of Armed Conflict produced by the International Institute for Strategic Studies (IISS 2000) or the related dataset of Sivard (1996). Fearon and Laitin (2000) is one such example, and provides a brief overview of differences between major datasets. Other datasets sometimes used by civil war researchers include Pillar (1983), Stedman (1991), Miall (1992), SIPRI Yearbook data (Wallensteen and Sollenberg 1999), and the State Failure Project (Esty, Goldstone, Gurr, Harff, Surko, Unger, and Chan 1998).
empirical definition matches the theoretical meaning of the same concept) of the COW definition is very high.

As the fundamental unit of analysis for this project is the civil war, it is the existence of a civil war which is the most critical measurement issue. While I begin with the COW definition of civil war, I modify and extend it in order to deal with several issues. I first examine how the definition has been applied and then examine difficulties created by particular characteristics of the CWTG rather than the definition itself. I first address the definition itself and then each of these issues in turn.

4.2.1 CIVIL WAR DEFINED BY THE CORRELATES OF WAR PROJECT

I begin with the 10.98 revision of the Correlates of War Project's Civil War Dataset, compiled by Meredith Sarkees (hereafter referred to as COW 10.98), which has been publicly released and described (Sarkees 2000). COW 10.98 begins with candidate conflicts that involve military action within the internationally recognized borders of a state. In addition to the requirement that military action occurs within the borders of a state, a prospective civil war must meet three central criteria to be included in this list: internality, intensity, and effective resistance.

*Internality*

In COW 10.98, internality is the requirement that a candidate conflict must be fought between the central government of a state and one or more indigenous armed groups within the borders of that state. It is a necessary corollary of this rule that a civil war
cannot occur before the independence of a state or after the destruction of a state's central government. In addition, COW 10.98 allows for the "transformation" of a civil war into an interstate war if "the bulk of fighting" against the government is taken over by another state and into an extra-state war if the "bulk of the fighting" against the rebels is taken over by another state (Sarkees 2000, 130).

Intensity

To meet the intensity criterion, a candidate conflict must result in a minimum of 1000 battle deaths per year. A battle death is defined as any battle-connected fatality suffered by a combatant, including deaths from both wounds and disease in the combat theater, and including victims of any postwar massacre of losers by the winners (Small and Singer 1982, 71). The definition of battle-deaths is consistent with the civil war termination game: they are presumably one component of the costs suffered by the sides, and a soldier lost to disease is just as costly as one killed by hostile fire.

Effective Resistance

Finally, the COW dataset requires "effective resistance" by the weaker side for inclusion in the civil war list. Effective resistance is perhaps the most vague of the three main criteria for inclusion. It was coded two ways. First, if the researchers' overall reading of the historical literature on a conflict suggested each side was initially organized for violent conflict and prepared to resist the attacks of its opponent then effective resistance was established. Second, if the rebels inflicted at least one battle-
death on government forces for every 20 battle-deaths they themselves suffered, effective resistance was established. Since in the majority of wars the COW project did not find an estimate of the casualties of the rebels, the first measure of effective resistance was the one normally used (Small and Singer 1982, 214-215). Subsequent COW codebooks and revisions (Singer and Small 1993, Sarkees 2000) do not mention the second standard. despite the fact that the current data still do not have estimates for the rebels in most wars. I conclude that both standards are operative since even recently added wars do not always have separate estimates of government and rebel battle-deaths.

4.2.2 INDETERMINACY: THE UNCERTAIN APPLICATION OF STANDARDS

There are some elements of the COW 10.98 definition of civil wars that are difficult to apply in practice. Since consistently applied standards are an important component of data reliability (Carmines and Zeller 1979), I implement a number of minor changes to this definition which increase the clarity of the definition and the degree to which it is useful for my analysis.

General Issue: One or Many Wars?

Civil wars can be complex processes, so a definition of civil war should allow the researcher to distinguish between one war and another. There are three standards used by the COW Project to distinguish one civil war from another:
1. Mutual exclusivity – If a war appears on one COW war list (interstate, extrastate, or intrastate), it cannot simultaneously appear on another. Therefore civil wars which begin to resemble interstate wars cease to be civil wars.

2. Six-month cease-fire – The COW Project defined the end of a war as “the day that most clearly demarcates the close of sustained military conflict” (Small and Singer 1982, 66). A cease-fire, armistice, or peace treaty provided the ending date of a war only insofar as it happened to coincide with the end of military operations: if combat ceased some time prior to such an agreement, that earlier date was used as the ending date for the war. COW 10.98 uses the rule that if a cease-fire holds for at least six months, any subsequent fighting is classified as a new civil war (Sarkees 2000).

3. State borders – Civil wars are distinct from each other if they occur within different states, even though the rebel group may be identical in both cases.

These coding rules are useful, but they leave three areas of uncertainty. First, they do not clarify when a war ends and another begins if no cease-fire is concluded but the level of violence drops for a time and then rises again. Since there are some lengthy wars in the COW civil war list that do not involve 1000 battle-deaths every year, it can be inferred that the intensity criterion as applied refers to average battle-connected fatalities. It follows that the intensity criterion does not offer a clear distinction between the beginning and ending of a war. If all other criteria for inclusion are met, a six-year conflict in which 50,000 die the first year and 500 die over the next five years
could be included in the COW dataset – or perhaps a year involving 50,000 deaths that
was preceded by five years of sub-1000 casualties might be included as a six-year war.
In practice, it is typically those wars in which two years of intense fighting are separated
by one or more years of lower-intensity conflict which are included in the dataset. ⁵⁹

Second, because the COW researchers were particularly concerned with number of
months of combat as a measure of the magnitude of wars, the COW coding rules allowed
for temporary interruptions in combat. The result was that some wars were coded as
having multiple phases so that a temporary respite from fighting of over one month’s
duration could be excluded from the overall calculation of war duration. Such multi-
phase wars introduce a different source of confusion, for there does not appear to be a
single decision rule consistently applied to all civil wars on the COW list that would
distinguish one lengthy war with interruptions from several short wars. While the 1910
Mexican Revolution is treated as a single 10-year war with an interruption (when the
rebels became the government), the Liberian civil war of the 1990s is divided into three
separate wars. None of the codebooks for the various civil war lists produced by the
COW Project establish standards for determining whether a war has ended or merely

⁵⁸ Personal communication with Meredith Sarkees. Annual Meeting of the International
⁵⁹ This coding issue has perplexed a number of researchers investigating civil war in a
quantitative fashion. Elbadawi and Sambanis (2000) address it specifically while many
others (see note 2) consolidate multiple COW wars or recode start and end dates. One
study reports a personal communication from Melvin Small indicating that the start date
for such a war was the year in which it finally reached the 1000 battle-death threshold
(Hegre, Ellingsen, Gleditsch, and Gates 2001, 36).
been interrupted, and some of the interruptions in multi-phase wars are much longer than six months.¹⁰ In fact, one interruption is exactly one year in length.

Third, the COW rules do not distinguish between a single civil war involving many rebel factions opposed to the central government and several simultaneous civil wars, each characterized by the same government fighting a different group of rebels. This second difficulty has been recognized by a number of researchers involved in the COW Project, and it does not appear that a widely-known rule exists within the COW Project for making this distinction.¹¹ Small and Singer (1982) refer to a number of specific cases, giving the impression that the degree of coordination between rebel groups was an important reason to separate China's 19th-century rebellions into the Taiping, Miao, and Nien rebellions. They acknowledge some connections between the revolts and indicate this by giving them code numbers following each other, instead of spacing them three numbers apart, but imply that they were distinct enough to be separate wars.²

¹⁰ Small and Singer's (1982) initial civil war list contained five of the six multiple-phase wars in COW 10.98. The other, the Ogaden War was redefined as a multi-phase war because an interstate war occurred in the middle of it between Ethiopia and Somalia, which was invading in support of the Ogaden rebels. Though COW 10.98 raises the total number of civil wars to 214 from the original 106, the only multi-phase wars added are those that were already multi-phase wars of a different type (extrasystemic). In short, none of the newly identified civil wars added since 1982 has been regarded as a multi-phase war.


² As it turns out, this historical judgement was likely incorrect, though it was based on the best available evidence at the time. The Nien, Moslems (considered a separate war in the 10.98 dataset), and Taipings actively worked to effect a union of their forces (Teng 1971). A Nien-Taiping alliance began to develop six years before the COW onset date (marked by China's recognition by other powers) and was formalized three years later. Indeed, after the fall of their capital and a string of military reverses, the remnants of the Taiping army merged with the Nien army in 1864 (Chiang 1954). Meanwhile, at least
COW 10.98 sometimes takes one course and sometimes the other. For example, the Russian Civil War is generally treated as one war despite the fact that the government faced three distinct Russian armies over three distinct periods of time as well as a large number of ethnic armies. This is particularly odd given the fact that it was categorized as two separate wars, one civil (anti-Bolsheviks) and one extrasystemic (Nationalities), prior to the 10.98 list’s transformation of many extrastate wars into civil wars. However, the 1920-1921 Green Rebellion of peasants in the Tambov region, which occurs contemporaneously with the Russian Civil War, is classified as being distinct from it.\(^6\)

Similarly, the Ethiopian civil war is divided into multiple wars by insurgent group, even though two of these groups, the Tigrean People’s Liberation Front and the Eritrean People’s Liberation Front were partially integrated into each others’ units, with the EPLF supplying armored units and the TPLF infantry. Indeed, the two jointly formed the EPDRF in about 1989, composed of 10,000 former EPLF and 55,000 former TPLF and fighting under a combined command, and it was this unit that seized Addis Ababa, ending the war or wars (Turner 1998, IISS 1991).

---

\(^6\) During the Tambov revolt, operations in other parts of the country made it impossible to spare more than 3000 Red Army troops to combat the rebels (Singleton 1966, 505).
Due to the uncertainty surrounding situations of extended war in the same state and multiple simultaneous wars in the same state, I adopt a number of coding rules and apply them to each war in the 10.98 dataset.

Onset -- A civil war begins with the first major armed confrontation between the government and rebels that is followed within 12 months by at least 1000 battle-deaths. Therefore, even if a battle kills 500 a civil war has not begun unless 500 more die within one year.

Termination -- A civil war ends if:

a. a truce or other agreement ended combat for one year or more.
b. the defeat of one side ends combat for one year or more. or
c. a 12-month period passes without 1000 battle-deaths: in this case, the termination date for the war is the last day in which in can be said that 1000-battle deaths were suffered during the previous 12 months.

I drop the notion of multiple-phase wars and recode them according to the above criteria. Appendix 4.1 details the results for each multiple-phase war.

If a new rebellion begins in the same state while a current rebellion is ongoing, it is treated as part of the same war.

Rule 4 enhances reliability of coding, but makes the assumption that civil wars end as if disparate rebel groups were a single unitary actor capable of bargaining with the government. This assumption is clearly false in some instances, but best meets the assumptions of the CWTG. This solution is therefore the more practical of the two for this study. While the question of how disunity or fragmentation in bargaining power
among rebel groups affects the course and outcome of civil wars is an interesting one. It is reserved for future examination when more data becomes available and the theory can generate implications regarding such divisions. Appendix 4.2 lists all changes made to the civil war list by application of this coding rule.

*Effective resistance*

Confusion exists in the interaction of the "five percent" and "organized for armed conflict" standards. In some cases of armed resistance to the government, the failure of the rebels to inflict five percent of their own casualties on the government is sufficient to recategorize the conflict from a civil war to a massacre.\(^{64}\) However, Small and Singer explicitly state that a conflict may be included even if organized opposition fails to meet this standard (1982, 214). Reliance on historical judgements of the existence of organized opposition without more a more specific definition of what constitutes organized opposition leaves the meaning of organization and the degree of historical consensus required in doubt. Finally, later codebooks for the COW data (Singer and Small 1993, Sarkees 2000) refer only to the 20:1 ratio and make no reference at all to the more common standard for establishing effective resistance.\(^{65}\)

\(^{64}\) For example, the 1923 Agrarian Rising in Bulgaria was initially classified as a massacre, although the peasants were nominally organized and armed. Later, this case was added to the civil war list.

\(^{65}\) The 10.98 dataset includes a government battle-death figure and a total-battle death figure. In most cases, the two are identical, indicating that the COW researchers were unable to establish rebel battle-deaths. Therefore, the historical judgement standard was the one most commonly used.
To the extent that confusion is merely due to unclear application of two different standards for establishing effective resistance, it can be resolved by clarifying the manner in which the standards are applied. I remove consideration of the degree to which the rebels were organized for armed opposition to the government from the standards for effective resistance. For the purposes of this study, effective resistance by the rebels means they have inflicted at least five percent of their own battle-deaths on the government.

It should be noted that even without the effective resistance criterion, the list of candidate wars would be narrowed to armed conflicts involving military action between a central government and rebel group(s) that resulted in at least 1000 battle-connected fatalities. It is relatively uncommon for military action to result in a significant number of battle-deaths yet be so completely imbalanced that one side suffers less than 1 death for every 20 inflicted on its opponent. Therefore, I code effective resistance as present in every conflict meeting other COW criteria unless I have affirmative evidence that a conflict was really a massacre. In other words, if military action within a state occurs between that state’s government and a non-state actor and 1000 battle-connected fatalities result, I assume for purposes of war inclusion/exclusion that both sides were capable of effective resistance unless there is evidence that indeed one side suffered more than 20 battle-deaths for every one suffered by its opponent. This “rebuttable presumption”

---

60 For example, an analysis of the 654 battles with casualty data for both sides in Dupuy’s database of 660 land battles fought over the last four centuries finds that only 4.6% of battles involved such imbalanced casualty ratios. Clodfelter’s encyclopedia of warfare notes that the ratio of casualties between winners and losers of wars (loosely defined as
standard acknowledges the paucity of historical data on casualties while still preserving transparency and being applicable to all wars.

4.2.3 THEORETICAL REQUIREMENTS

The above changes should increase the reliability of my data by making coding consistent across cases. They also pay theoretical dividends in two respects. First, the CWTG is dyadic in nature, presuming a government against rebels and that the two of them together have the ability to authoritatively allocate resources. In its world, there cannot be multiple simultaneous civil wars. Collapsing multiple wars into one will make the data appropriate for testing the CWTG's implications. Second, in a study of war termination, it is useful for each war to possess a single date of termination. Eliminating multiple-phase wars is therefore valid from a theoretical perspective as well as a practical one.

Unfortunately, several discrepancies between the requirements of the theory and the COW 10.98 data remain. These obstacles to analysis stem not from any flaw in the data, but rather from the particular requirements of the CWTG. I further modify the COW 10.98 definition in order to better test the CWTG. Changes are made to two components of the definition: the internality criterion and the effective resistance criterion.
**Internality**

As noted, the 10.98 revision of the COW civil war list regards civil wars as terminated if they “become” interstate or extra-state through the bulk of fighting being taken over by another state. This standard is theoretically inappropriate for evaluating the CWTG. The civil war termination game implies that as the total strength on one side of the war increases, the probability of military victory by that side also increases (given a military outcome to the war). The application of the internality criterion to ongoing civil wars means that at some point, if a side’s military forces are primarily drawn from the armed forces of allied states, the war disappears from the dataset. This makes it difficult to test this implication of the theory with respect to military intervention, since the largest military interventions are excluded from the analysis.

For these reasons, a civil war that “becomes” interstate or extrastate by the COW internality criterion is not regarded by this study as terminated. Termination dates are recoded so that the end of a civil war occurs when either the government, the rebels, and their allies cease to fight each other according to Rule 2 above or when either side ceases to exist as even a nominal combatant. This coding rule frees the researcher from having to determine the proportion of fighting being borne by an intervenor to that borne by its allies. Identifying the targets of intervention is far simpler than identifying both the target and the relative burden of fighting among allies. A civil war becomes an extra-state war only if the area in questions ceases to be a state – that is, if the nominal government is merely a puppet of a foreign power and in fact does not control the allocation of resources within its borders. The COW system-membership list, which
provides beginning and ending dates of state independence, is sufficient to distinguish between independent and puppet states. This study will continue to examine a civil war until the state, its government, or the rebels cease to exist, and will evaluate the outcome of that war with respect to relative control over the state's resources between the government and rebels. Appendix 4.3 lists the changes made to the COW civil war list by application of this rule.

Similarly, although the 10.98 revision of the civil war list treats interventions as dyadic civil wars between the intervenor and the target of the intervention, these are not treated as separate wars in the war list I use, as this is not how intervention is represented within the CWTG.

Effective Resistance

The effective resistance criterion also raises an important theoretical issue. The 10.98 revision of the COW war list requires effective resistance only on the part of the rebels, not the government. However, a situation in which the government is incapable of inflicting substantial losses on the opposition does not satisfy the requirements of the civil war termination game, which presumes both some degree of military uncertainty regarding the war's outcome and the ability of each side to inflict costs on its opponent. Even absent these requirements, the application of the effective resistance requirement to the rebels but not the government would inhibit analysis of those hypotheses involving costs. For situations of very low costs for the rebels would be excluded from empirical analysis. For these reasons, I require that both the government and the rebels must inflict
5% of their own battle-deaths on each other. Appendix 4.4 lists the changes made to the COW war list by application of this rule or because new information suggests that the COW criteria are not met.

4.2.4 APPLICATION OF NEW INFORMATION

A number of further modifications to the 10.98 revision of the COW civil war list are not due to changes in coding rules. In the process of research, a large number of historical sources were consulted that do not appear to have been available to the original COW researchers. Sometimes, the results of this research allows me to fill in missing data in the COW data set. In some cases, this historical information suggests that an earlier date or other coding decision was probably under the COW coding rules. Of particular relevance to the civil war list itself are several cases in which newer information suggests that a war that was included should have been excluded or vice versa.

One of the first steps in the research process was to use the list of wars and sources in Small and Singer (1982) to retrace as much as possible the steps in the COW coding process. Information provided by Meredith Sarkees on the sources used to code some of the later wars was also useful. In short, my historical research included the COW sources when they were available and then proceeded to examine other sources not cited by Small and Singer. In a few instances, changes were made simply because later editions of historical texts used by the COW researchers acknowledged earlier errors in estimates. More commonly, I relied on the degree to which authors were able to describe the
reasons for their estimates. In short, this was not an attempt to recollect the COW data
sui generis but rather an attempt to begin with what had been constructed by the COW
researchers and, by adding to the base of historical research that informed them, increase
the accuracy of the data. While additional information can sometimes confuse and
obscure, I have attempted to make changes of this sort only when a clear rationale under
the COW coding rules as modified for this study can be established. On balance, the
result of adding new information to what was already discovered should be a modest
increase in accuracy. Appendix 4.5 lists and describes the reasoning behind all additions
and changes to the civil war list itself that resulted from historical research.

Finally, as this study examines civil war termination, those wars not ended by
December 31, 1997 are excluded from analysis. The final list of 199 dyadic civil wars
beginning after 1816 and ending before 1998 is presented in Table 4.1, which highlights
alterations made to the original 10.98 dataset. I altered names of civil wars when it was
clear that historians had a more specific name for a war than the 10.98 dataset, when a
war name was duplicated, or when it was confusing (for example, a “Second Frolinat”
that occurred after two previous Frolinat rebellions). Table 4.1 provides the point of
departure for all other variables.
Table 4.1: Civil War List. Changes from the 10.98 COW list are in boldface. Zeroes under dates represent missing values. Boldface state names indicate entirely new wars added after historical research.

<table>
<thead>
<tr>
<th>War Name</th>
<th>State</th>
<th>Rebels</th>
<th>Onset</th>
<th>Termination</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Caucasus</td>
<td>Russia</td>
<td>Georgians, Chechens, Dhagestanis</td>
<td>6 10 1818</td>
<td>0 0 1822</td>
</tr>
<tr>
<td>Neapolitan Revolution</td>
<td>Two Sicilies</td>
<td>Anti-monarchy</td>
<td>7 2 1820</td>
<td>3 23 1821</td>
</tr>
<tr>
<td>Sardinian Revolt</td>
<td>Sardinia</td>
<td>Sardinians</td>
<td>3 10 1821</td>
<td>4 8 1821</td>
</tr>
<tr>
<td>Greek Independence</td>
<td>Ottoman Empire</td>
<td>Greeks, Ali Pasha, Janissaries</td>
<td>3 25 1821</td>
<td>9 14 1829</td>
</tr>
<tr>
<td>Royalist Rebellion</td>
<td>Spain</td>
<td>Royalists</td>
<td>12 1 1821</td>
<td>11 13 1823</td>
</tr>
<tr>
<td>Miguelite War</td>
<td>Portugal</td>
<td>Conservatives</td>
<td>7 1 1829</td>
<td>7 5 1834</td>
</tr>
<tr>
<td>First Murid-Polish</td>
<td>Russia</td>
<td>Murids, Poles, Moldavian Peasants</td>
<td>1 0 1830</td>
<td>10 0 1832</td>
</tr>
<tr>
<td>Albanian</td>
<td>Ottoman Empire</td>
<td>Albanians and Bosnian Kapetans</td>
<td>2 0 1830</td>
<td>11 0 1831</td>
</tr>
<tr>
<td>July Revolution</td>
<td>France</td>
<td>Liberals</td>
<td>7 25 1830</td>
<td>7 29 1830</td>
</tr>
<tr>
<td>Belgian Independence</td>
<td>Netherlands</td>
<td>Belgians</td>
<td>8 25 1830</td>
<td>12 23 1831</td>
</tr>
<tr>
<td>First Syrian</td>
<td>Ottoman Empire</td>
<td>Egyptians</td>
<td>11 1 1831</td>
<td>12 21 1832</td>
</tr>
<tr>
<td>First Mexican</td>
<td>Mexico</td>
<td>Liberals</td>
<td>1 2 1832</td>
<td>12 11 1832</td>
</tr>
<tr>
<td>Second Murid</td>
<td>Russia</td>
<td>Murids</td>
<td>1 0 1834</td>
<td>12 0 1834</td>
</tr>
<tr>
<td>First Carlist War</td>
<td>Spain</td>
<td>Carlists</td>
<td>7 15 1834</td>
<td>7 15 1840</td>
</tr>
<tr>
<td>Farroupilha War</td>
<td>Brazil</td>
<td>Farrapos</td>
<td>0 0 1835</td>
<td>3 1 1845</td>
</tr>
<tr>
<td>Texan</td>
<td>Mexico</td>
<td>Texans</td>
<td>10 1 1835</td>
<td>4 22 1836</td>
</tr>
<tr>
<td>First Bosnian</td>
<td>Ottoman Empire</td>
<td>West Bosnian Kapetans</td>
<td>0 0 1836</td>
<td>0 0 1837</td>
</tr>
<tr>
<td>Third Murid</td>
<td>Russia</td>
<td>Murids</td>
<td>6 0 1836</td>
<td>12 0 1852</td>
</tr>
<tr>
<td>Second Syrian</td>
<td>Ottoman Empire</td>
<td>Mehmet Ali</td>
<td>6 10 1839</td>
<td>6 24 1839</td>
</tr>
<tr>
<td>War of the Supremes</td>
<td>Colombia</td>
<td>Progressives</td>
<td>7 15 1840</td>
<td>7 15 1842</td>
</tr>
<tr>
<td>Second Bosnian</td>
<td>Ottoman Empire</td>
<td>Bosnian Kapetans</td>
<td>0 0 1841</td>
<td>0 0 1841</td>
</tr>
<tr>
<td>Unitario Rebellion</td>
<td>Argentina</td>
<td>Unitarios</td>
<td>1 1 1841</td>
<td>12 6 1842</td>
</tr>
<tr>
<td>Second Carlist</td>
<td>Spain</td>
<td>Carlists</td>
<td>5 15 1847</td>
<td>5 1 1849</td>
</tr>
<tr>
<td>Caste War/Maya Revolt</td>
<td>Mexico</td>
<td>Yucatan Maya</td>
<td>7 26 1847</td>
<td>3 4 1855</td>
</tr>
<tr>
<td>War Name</td>
<td>State</td>
<td>Rebels</td>
<td>Onset Year</td>
<td>Termination Year</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------</td>
<td>-------------------------</td>
<td>------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Second Two Sicilies</td>
<td>Two Sicilies</td>
<td>Liberals</td>
<td>1 12 1848</td>
<td>5 15 1849</td>
</tr>
<tr>
<td>Hungarian-Viennese</td>
<td>Austria-Hungary</td>
<td>Viennese</td>
<td>3 13 1848</td>
<td>8 13 1849</td>
</tr>
<tr>
<td>June Days</td>
<td>France</td>
<td>Radicals</td>
<td>6 23 1848</td>
<td>6 26 1848</td>
</tr>
<tr>
<td>First Chilean</td>
<td>Chile</td>
<td>Liberals</td>
<td>9 15 1851</td>
<td>12 15 1851</td>
</tr>
<tr>
<td>Massacre of the Boulevards</td>
<td>France</td>
<td>Republicans</td>
<td>12 2 1851</td>
<td>12 4 1851</td>
</tr>
<tr>
<td>First Turco-Montenegrar</td>
<td>Ottoman Empire</td>
<td>Montenegrins</td>
<td>12 2 1852</td>
<td>3 13 1853</td>
</tr>
<tr>
<td>First Peru</td>
<td>Peru</td>
<td>Liberals</td>
<td>12 21 1853</td>
<td>1 7 1855</td>
</tr>
<tr>
<td>Second Peru</td>
<td>Peru</td>
<td>Conservatives</td>
<td>10 31 1856</td>
<td>3 7 1858</td>
</tr>
<tr>
<td>War of the Reform</td>
<td>Mexico</td>
<td>Liberals</td>
<td>2 15 1858</td>
<td>1 1 1861</td>
</tr>
<tr>
<td>Second Turco-Montenegrar</td>
<td>Ottoman Empire</td>
<td>Montenegrins and Bosnian Serbs</td>
<td>5 4 1858</td>
<td>6 1 1859</td>
</tr>
<tr>
<td>Second Chilean</td>
<td>Chile</td>
<td>Fusionists and Miners</td>
<td>12 12 1858</td>
<td>4 29 1859</td>
</tr>
<tr>
<td>Federal War</td>
<td>Venezuela</td>
<td>Liberals</td>
<td>2 1 1859</td>
<td>12 31 1863</td>
</tr>
<tr>
<td>Chinese Nineteenth Century</td>
<td>China</td>
<td>Taipings, Nien, Miao, Moslems</td>
<td>1 1 1860</td>
<td>5 16 1877</td>
</tr>
<tr>
<td>Second Colombia</td>
<td>Colombia</td>
<td>Liberals</td>
<td>5 15 1860</td>
<td>10 15 1862</td>
</tr>
<tr>
<td>U.S. Civil War</td>
<td>USA</td>
<td>Confederacy</td>
<td>4 10 1861</td>
<td>4 9 1865</td>
</tr>
<tr>
<td>Second Buenos Aires</td>
<td>Argentina</td>
<td>Beunos Aires</td>
<td>8 20 1861</td>
<td>12 2 1861</td>
</tr>
<tr>
<td>Third Turco-Montenegrar</td>
<td>Ottoman Empire</td>
<td>Montenegro</td>
<td>0 0 1862</td>
<td>8 31 1862</td>
</tr>
<tr>
<td>Second Polish</td>
<td>Russia</td>
<td>Poles</td>
<td>1 22 1863</td>
<td>4 19 1864</td>
</tr>
<tr>
<td>Montonero Revolt</td>
<td>Argentina</td>
<td>Montoneros</td>
<td>4 2 1863</td>
<td>11 12 1863</td>
</tr>
<tr>
<td>Kanto Insurrection</td>
<td>Japan</td>
<td>Mito rebels</td>
<td>6 6 1864</td>
<td>12 31 1864</td>
</tr>
<tr>
<td>First Cretan</td>
<td>Ottoman Empire</td>
<td>Cretans</td>
<td>5 29 1866</td>
<td>2 22 1867</td>
</tr>
<tr>
<td>Argentine Federalist</td>
<td>Argentina</td>
<td>Federalists</td>
<td>12 15 1866</td>
<td>10 15 1867</td>
</tr>
<tr>
<td>Guerre des Caeos</td>
<td>Haiti</td>
<td>Peasants</td>
<td>6 0 1867</td>
<td>1 15 1870</td>
</tr>
<tr>
<td>Boshin War</td>
<td>Japan</td>
<td>Tokugawa</td>
<td>1 2 1868</td>
<td>5 0 1869</td>
</tr>
<tr>
<td>Blue Revolution</td>
<td>Venezuela</td>
<td>Conservatives</td>
<td>1 11 1868</td>
<td>8 14 1868</td>
</tr>
<tr>
<td>Spanish Liberals</td>
<td>Spain</td>
<td>Liberals</td>
<td>9 19 1868</td>
<td>9 29 1868</td>
</tr>
<tr>
<td>War Name</td>
<td>State</td>
<td>Rebels</td>
<td>Onset</td>
<td>Termination</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------</td>
<td>--------------------------</td>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>Yellow Revolution</td>
<td>Venezuela</td>
<td>Radicals</td>
<td>8 14 1869</td>
<td>1 7 1871</td>
</tr>
<tr>
<td>Entre Rios</td>
<td>Argentina</td>
<td>Entre Rios Province</td>
<td>5 20 1870</td>
<td>3 13 1871</td>
</tr>
<tr>
<td>Paris Commune</td>
<td>France</td>
<td>Communards</td>
<td>4 2 1871</td>
<td>5 29 1871</td>
</tr>
<tr>
<td>Third Carlist</td>
<td>Spain</td>
<td>Carlists</td>
<td>4 20 1872</td>
<td>2 20 1876</td>
</tr>
<tr>
<td>Mitre Rebellion</td>
<td>Argentina</td>
<td>Mitre led Rebels</td>
<td>9 0 1874</td>
<td>11 6 1874</td>
</tr>
<tr>
<td>Balkan</td>
<td>Ottoman Empire</td>
<td>Christian Bosnians</td>
<td>7 3 1875</td>
<td>1 3 1878</td>
</tr>
<tr>
<td>Sioux War</td>
<td>USA</td>
<td>Sioux</td>
<td>2 1 1876</td>
<td>10 31 1876</td>
</tr>
<tr>
<td>Diaz Revolt</td>
<td>Mexico</td>
<td>Rebels</td>
<td>3 0 1876</td>
<td>11 23 1876</td>
</tr>
<tr>
<td>Third Colombia</td>
<td>Colombia</td>
<td>Liberals</td>
<td>11 15 1876</td>
<td>7 1 1877</td>
</tr>
<tr>
<td>Satsuma Rebellion</td>
<td>Japan</td>
<td>Satsumas</td>
<td>1 29 1877</td>
<td>9 24 1877</td>
</tr>
<tr>
<td>Third Buenos Aires</td>
<td>Argentina</td>
<td>Buenos Aires</td>
<td>6 15 1880</td>
<td>7 21 1880</td>
</tr>
<tr>
<td>Fourth Colombia</td>
<td>Colombia</td>
<td>Liberals</td>
<td>11 15 1884</td>
<td>8 15 1885</td>
</tr>
<tr>
<td>Second Cretan</td>
<td>Ottoman Empire</td>
<td>Cretans</td>
<td>0 0 1888</td>
<td>0 0 1889</td>
</tr>
<tr>
<td>Congressist War</td>
<td>Chile</td>
<td>Congressists</td>
<td>1 7 1891</td>
<td>8 29 1891</td>
</tr>
<tr>
<td>Naval Revolt</td>
<td>Brazil</td>
<td>Rio Grande do Sul, Naval Royalists</td>
<td>2 2 1893</td>
<td>8 31 1894</td>
</tr>
<tr>
<td>Tonghak Rebellion</td>
<td>Korea</td>
<td>Tonghak Society</td>
<td>2 0 1894</td>
<td>2 0 1895</td>
</tr>
<tr>
<td>Third Peru</td>
<td>Peru</td>
<td>Liberals</td>
<td>10 15 1894</td>
<td>3 19 1895</td>
</tr>
<tr>
<td>Third Cretan</td>
<td>Ottoman Empire</td>
<td>Cretans and Druze</td>
<td>2 0 1896</td>
<td>5 19 1897</td>
</tr>
<tr>
<td>Canudos Rebellion</td>
<td>Brazil</td>
<td>Canudos</td>
<td>10 1 1896</td>
<td>10 5 1897</td>
</tr>
<tr>
<td>Revolución Liberal Restauradora</td>
<td>Venezuela</td>
<td>Castro Led Rebels</td>
<td>5 24 1899</td>
<td>10 22 1899</td>
</tr>
<tr>
<td>War of a Thousand Days</td>
<td>Colombia</td>
<td>Liberals</td>
<td>9 1 1899</td>
<td>6 15 1903</td>
</tr>
<tr>
<td>Liberative Revolution</td>
<td>Venezuela</td>
<td>Matos Led Rebels</td>
<td>12 0 1901</td>
<td>7 0 1903</td>
</tr>
<tr>
<td>Ilinden</td>
<td>Ottoman Empire</td>
<td>IMRO/VMRO</td>
<td>8 2 1903</td>
<td>11 2 1903</td>
</tr>
<tr>
<td>Uruguay</td>
<td>Uruguay</td>
<td>Blancos</td>
<td>1 1 1904</td>
<td>9 1 1904</td>
</tr>
<tr>
<td>Russian Peasants</td>
<td>Russia</td>
<td>Workers/Peasants</td>
<td>1 22 1905</td>
<td>1 1 1906</td>
</tr>
<tr>
<td>Rumanian Peasants</td>
<td>Rumania</td>
<td>Peasants</td>
<td>3 15 1907</td>
<td>4 30 1907</td>
</tr>
<tr>
<td>War Name</td>
<td>State</td>
<td>Rebels</td>
<td>Onset Year</td>
<td>Termination Year</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------</td>
<td>------------------------------------</td>
<td>------------</td>
<td>------------------</td>
</tr>
<tr>
<td>First Morocco</td>
<td>Morocco</td>
<td>Fez Caids</td>
<td>8 1 1907</td>
<td>9 1 1908</td>
</tr>
<tr>
<td>First Iran</td>
<td>Iran</td>
<td>Constitutionalists</td>
<td>6 23 1908</td>
<td>7 17 1909</td>
</tr>
<tr>
<td>Mexican Revolution I</td>
<td>Mexico</td>
<td>Liberals &amp; Radicals</td>
<td>11 20 1910</td>
<td>6 7 1911</td>
</tr>
<tr>
<td>First Paraguay</td>
<td>Paraguay</td>
<td>Rojista Radical Liberals</td>
<td>7 15 1911</td>
<td>5 11 1912</td>
</tr>
<tr>
<td>Mexican Revolution II</td>
<td>Mexico</td>
<td>Radicals</td>
<td>8 30 1911</td>
<td>7 15 1914</td>
</tr>
<tr>
<td>First Nationalist Revolution</td>
<td>China</td>
<td>Republicans</td>
<td>10 11 1911</td>
<td>12 31 1911</td>
</tr>
<tr>
<td>Second Revolution</td>
<td>China</td>
<td>Republicans</td>
<td>7 12 1913</td>
<td>9 1 1913</td>
</tr>
<tr>
<td>Pai Ling Rebellion</td>
<td>China</td>
<td>Pai Lang</td>
<td>3 15 1914</td>
<td>9 15 1914</td>
</tr>
<tr>
<td>Conventionist-Consitutionalist</td>
<td>Mexico</td>
<td>Conventionists</td>
<td>12 1 1914</td>
<td>7 28 1920</td>
</tr>
<tr>
<td>Yunnan Revolt</td>
<td>China</td>
<td>Southern Provinces</td>
<td>1 0 1916</td>
<td>11 17 1918</td>
</tr>
<tr>
<td>Anti-Conscription Rebellions</td>
<td>Russia</td>
<td>Kirghiz, Kazachs, Turkistanis</td>
<td>7 4 1916</td>
<td>2 27 1917</td>
</tr>
<tr>
<td>Russian Civil War</td>
<td>Russia</td>
<td>Anti-Bolsheviks and Nationalities</td>
<td>12 9 1917</td>
<td>8 0 1921</td>
</tr>
<tr>
<td>Finland</td>
<td>Finland</td>
<td>Communists</td>
<td>1 28 1918</td>
<td>4 30 1918</td>
</tr>
<tr>
<td>Bela Kun</td>
<td>Hungary</td>
<td>Anti-Communists</td>
<td>3 25 1919</td>
<td>2 15 1920</td>
</tr>
<tr>
<td>Agrarian Rising</td>
<td>Bulgaria</td>
<td>Agrarian League</td>
<td>9 23 1923</td>
<td>9 28 1923</td>
</tr>
<tr>
<td>De La Huerta Rebellion</td>
<td>Mexico</td>
<td>Huerta Led Rebels</td>
<td>12 4 1923</td>
<td>2 0 1924</td>
</tr>
<tr>
<td>Honduras</td>
<td>Honduras</td>
<td>Conservatives</td>
<td>2 9 1924</td>
<td>3 31 1924</td>
</tr>
<tr>
<td>Khost Rebellion</td>
<td>Afghanistan</td>
<td>Anti-Reformists</td>
<td>3 15 1924</td>
<td>1 15 1925</td>
</tr>
<tr>
<td>Northern Expedition</td>
<td>China</td>
<td>Kuomintang and Muslims</td>
<td>7 1 1926</td>
<td>6 30 1928</td>
</tr>
<tr>
<td>Cristero-Escobar Rebellions</td>
<td>Mexico</td>
<td>Cristeros and Escobar-led rebels</td>
<td>8 31 1926</td>
<td>6 15 1930</td>
</tr>
<tr>
<td>Afghan Revolution</td>
<td>Afghanistan</td>
<td>Anti-Reformists</td>
<td>11 10 1928</td>
<td>10 15 1929</td>
</tr>
<tr>
<td>Chinese War Lords</td>
<td>China</td>
<td>Hu-Tang Chiu-Kuo Chun</td>
<td>3 1 1929</td>
<td>10 13 1930</td>
</tr>
<tr>
<td>Basmachi Revolt</td>
<td>USSR</td>
<td>Basmachi</td>
<td>3 27 1929</td>
<td>12 0 1931</td>
</tr>
<tr>
<td>Ikhwan Revolt</td>
<td>Saudi Arabia</td>
<td>Ikhwan</td>
<td>3 30 1929</td>
<td>1 10 1930</td>
</tr>
<tr>
<td>Chinese Communists</td>
<td>China</td>
<td>Communists</td>
<td>11 15 1930</td>
<td>12 0 1936</td>
</tr>
<tr>
<td>Sao Paolo</td>
<td>Brazil</td>
<td>Paolistas</td>
<td>6 9 1932</td>
<td>8 31 1932</td>
</tr>
<tr>
<td>War Name</td>
<td>State</td>
<td>Rebels</td>
<td>Onset Month Day Year</td>
<td>Termination Month Day Year</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-----------------</td>
<td>------------------------------------</td>
<td>----------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Miners Revolt</td>
<td>Spain</td>
<td>Asturian Miners</td>
<td>10 4 1934</td>
<td>10 8 1934</td>
</tr>
<tr>
<td>Spanish Civil War</td>
<td>Spain</td>
<td>Fascists</td>
<td>7 18 1936</td>
<td>3 29 1939</td>
</tr>
<tr>
<td>Forest Bretheren</td>
<td>USSR</td>
<td>Baltic Rebels</td>
<td>0 0 1944</td>
<td>0 0 1953</td>
</tr>
<tr>
<td>Greek Civil War -- Second Round</td>
<td>Greece</td>
<td>Communists</td>
<td>12 3 1944</td>
<td>2 12 1945</td>
</tr>
<tr>
<td>Ukrainian People's Army</td>
<td>Poland</td>
<td>UPA and Home Army</td>
<td>6 28 1945</td>
<td>3 0 1948</td>
</tr>
<tr>
<td>Chinese Civil War</td>
<td>China</td>
<td>Communists</td>
<td>3 15 1946</td>
<td>4 21 1950</td>
</tr>
<tr>
<td>Greek Civil War -- Third Round</td>
<td>Greece</td>
<td>Communists</td>
<td>11 15 1946</td>
<td>10 16 1949</td>
</tr>
<tr>
<td>Second Paraguayan</td>
<td>Paraguay</td>
<td>Leftists</td>
<td>3 7 1947</td>
<td>8 20 1947</td>
</tr>
<tr>
<td>Sanaa Revolt</td>
<td>North Yemen</td>
<td>al-Wazir and Sanaa Garrison</td>
<td>2 17 1948</td>
<td>3 20 1948</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>Costa Rica</td>
<td>National Union Party</td>
<td>3 12 1948</td>
<td>4 17 1948</td>
</tr>
<tr>
<td>La Violencia I</td>
<td>Colombia</td>
<td>Conservatives</td>
<td>4 9 1948</td>
<td>4 12 1949</td>
</tr>
<tr>
<td>First Burmese</td>
<td>Burma</td>
<td>Karens and Communists</td>
<td>1 31 1949</td>
<td>7 31 1951</td>
</tr>
<tr>
<td>La Violencia II</td>
<td>Colombia</td>
<td>Liberals</td>
<td>9 15 1949</td>
<td>12 31 1962</td>
</tr>
<tr>
<td>South Moluccas</td>
<td>Indonesia</td>
<td>Moluccans</td>
<td>5 31 1950</td>
<td>11 3 1950</td>
</tr>
<tr>
<td>Huk Rebellion</td>
<td>Philippines</td>
<td>Huks</td>
<td>9 1 1950</td>
<td>0 0 1954</td>
</tr>
<tr>
<td>Bolivian National Revolution</td>
<td>Bolivia</td>
<td>Leftists</td>
<td>4 9 1952</td>
<td>4 11 1952</td>
</tr>
<tr>
<td>Darul Islam</td>
<td>Indonesia</td>
<td>Darul Islam and Leftists</td>
<td>9 20 1953</td>
<td>6 4 1962</td>
</tr>
<tr>
<td>Anti-Peron Coup</td>
<td>Argentina</td>
<td>Army</td>
<td>6 15 1955</td>
<td>9 19 1955</td>
</tr>
<tr>
<td>Tibetan</td>
<td>China</td>
<td>Tibetans</td>
<td>3 1 1956</td>
<td>3 22 1959</td>
</tr>
<tr>
<td>Second Burmese</td>
<td>Burma</td>
<td>Ethnic Rebels</td>
<td>0 0 1958</td>
<td>0 0 1960</td>
</tr>
<tr>
<td>First Lebanon</td>
<td>Lebanon</td>
<td>Leftists</td>
<td>5 9 1958</td>
<td>9 15 1958</td>
</tr>
<tr>
<td>Cuban Revolution</td>
<td>Cuba</td>
<td>Castroites</td>
<td>6 15 1958</td>
<td>1 2 1959</td>
</tr>
<tr>
<td>Mosul Revolt</td>
<td>Iraq</td>
<td>Shammar Tribe, 5th Bde of 2nd Div</td>
<td>3 6 1959</td>
<td>3 10 1959</td>
</tr>
<tr>
<td>Vietnam War</td>
<td>South Vietnam</td>
<td>NL.F</td>
<td>1 1 1960</td>
<td>4 30 1975</td>
</tr>
<tr>
<td>Katanga-Simba Rebellions</td>
<td>Congo</td>
<td>Katanga, Jeunesse, Simbas</td>
<td>7 4 1960</td>
<td>9 1 1965</td>
</tr>
<tr>
<td>First Laotian</td>
<td>Laos</td>
<td>Pathet Lao</td>
<td>10 15 1960</td>
<td>7 15 1962</td>
</tr>
<tr>
<td>War Name</td>
<td>State</td>
<td>Rebels</td>
<td>Onset/Duration</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------</td>
<td>-------------------------------</td>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td>First Kurdish</td>
<td>Iraq</td>
<td>Kurds</td>
<td>9 11 1961 - 2 12 1964</td>
<td></td>
</tr>
<tr>
<td>Post-Independence</td>
<td>Algeria</td>
<td>Ben Bella Faction</td>
<td>7 28 1962 - 1 15 1963</td>
<td></td>
</tr>
<tr>
<td>Yemeni Royalist</td>
<td>North Yemen</td>
<td>Royalists</td>
<td>11 15 1962 - 9 3 1969</td>
<td></td>
</tr>
<tr>
<td>Second Laotian</td>
<td>Laos</td>
<td>Pathet Lao</td>
<td>3 0 1963 - 2 15 1973</td>
<td></td>
</tr>
<tr>
<td>Anya Nya</td>
<td>Sudan</td>
<td>Anya Nya</td>
<td>10 1 1963 - 2 28 1972</td>
<td></td>
</tr>
<tr>
<td>First Rwanda</td>
<td>Rwanda</td>
<td>Watusi</td>
<td>11 15 1963 - 2 6 1964</td>
<td></td>
</tr>
<tr>
<td>Second Kurdish</td>
<td>Iraq</td>
<td>Kurds</td>
<td>2 0 1965 - 6 29 1966</td>
<td></td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>Dominican Republic</td>
<td>Leftists</td>
<td>4 25 1965 - 9 1 1965</td>
<td></td>
</tr>
<tr>
<td>First Frolinat Rebellion</td>
<td>Chad</td>
<td>Frolinat Rebels</td>
<td>10 0 1965 - 6 16 1971</td>
<td></td>
</tr>
<tr>
<td>Buganda</td>
<td>Uganda</td>
<td>Buganda Tribe</td>
<td>5 23 1966 - 6 1 1966</td>
<td></td>
</tr>
<tr>
<td>Second Guatemala</td>
<td>Guatemala</td>
<td>Leftists and Indians</td>
<td>10 0 1966 - 7 12 1972</td>
<td></td>
</tr>
<tr>
<td>Biafra</td>
<td>Nigeria</td>
<td>Biafrans</td>
<td>7 6 1967 - 1 12 1970</td>
<td></td>
</tr>
<tr>
<td>Cultural Revolution</td>
<td>China</td>
<td>Red Guard</td>
<td>9 5 1967 - 9 1 1968</td>
<td></td>
</tr>
<tr>
<td>Third Burmese</td>
<td>Burma</td>
<td>Ethnic Rebels</td>
<td>0 0 1968 - 1 7 1995</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>Thailand</td>
<td>Communists</td>
<td>0 0 1969 - 10 10 1973</td>
<td></td>
</tr>
<tr>
<td>Third Kurdish</td>
<td>Iraq</td>
<td>Kurds</td>
<td>1 3 1969 - 3 11 1970</td>
<td></td>
</tr>
<tr>
<td>First Cambodian</td>
<td>Cambodia</td>
<td>Khmer Rouge</td>
<td>3 20 1970 - 3 15 1975</td>
<td></td>
</tr>
<tr>
<td>East Pakistan</td>
<td>Pakistan</td>
<td>Bengalis</td>
<td>3 25 1971 - 12 17 1971</td>
<td></td>
</tr>
<tr>
<td>First JVP</td>
<td>Sri Lanka</td>
<td>Janatha Vimukthi- JVP</td>
<td>4 6 1971 - 5 16 1971</td>
<td></td>
</tr>
<tr>
<td>Moro Rebellion</td>
<td>Philippines</td>
<td>Moros and NPA</td>
<td>1 1 1972 - 12 31 1992</td>
<td></td>
</tr>
<tr>
<td>First Burundi</td>
<td>Burundi</td>
<td>Hutu</td>
<td>4 30 1972 - 5 25 1972</td>
<td></td>
</tr>
<tr>
<td>Rhodesia</td>
<td>Rhodesia</td>
<td>Patriotic Front</td>
<td>12 28 1972 - 12 28 1979</td>
<td></td>
</tr>
<tr>
<td>Baluchistan</td>
<td>Pakistan</td>
<td>Baluchi Rebels</td>
<td>1 23 1973 - 7 0 1977</td>
<td></td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Ethiopia</td>
<td>Eritreans, Tigreans, Ogaden rebels</td>
<td>1 1 1974 - 5 28 1991</td>
<td></td>
</tr>
<tr>
<td>Fourth Kurdish</td>
<td>Iraq</td>
<td>Kurds</td>
<td>3 18 1974 - 4 3 1975</td>
<td></td>
</tr>
<tr>
<td>War Name</td>
<td>State</td>
<td>Rebels</td>
<td>Onset</td>
<td>Termination</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------</td>
<td>-------------------------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>Second Lebanon</td>
<td>Lebanon</td>
<td>Muslims</td>
<td>4 13 1975</td>
<td>10 13 1990</td>
</tr>
<tr>
<td>First Angola</td>
<td>Angola</td>
<td>UNITA</td>
<td>11 11 1975</td>
<td>5 31 1991</td>
</tr>
<tr>
<td>East Timor</td>
<td>Indonesia</td>
<td>Fretillin</td>
<td>7 18 1976</td>
<td>1 1 1979</td>
</tr>
<tr>
<td>Second Frolinat</td>
<td>Chad</td>
<td>Frolinat</td>
<td>2 0 1978</td>
<td>3 19 1979</td>
</tr>
<tr>
<td>Third Guatemala</td>
<td>Guatemala</td>
<td>Leftists</td>
<td>3 12 1978</td>
<td>4 13 1984</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>Afghanistan</td>
<td>Mujahedins</td>
<td>6 1 1978</td>
<td>4 0 1992</td>
</tr>
<tr>
<td>Islamic Revolution</td>
<td>Iran</td>
<td>Anti-Shah Coalition</td>
<td>9 3 1978</td>
<td>2 12 1979</td>
</tr>
<tr>
<td>Sandinista-Somoza War</td>
<td>Nicaragua</td>
<td>Sandinistas</td>
<td>10 1 1978</td>
<td>7 18 1979</td>
</tr>
<tr>
<td>Second Cambodian</td>
<td>Kampuchea</td>
<td>Khmer Rouge</td>
<td>1 8 1979</td>
<td>10 23 1991</td>
</tr>
<tr>
<td>Fedayeen</td>
<td>Iran</td>
<td>Mujahideen-Fedayeen, Kurds</td>
<td>2 14 1979</td>
<td>5 3 1982</td>
</tr>
<tr>
<td>El Salvador</td>
<td>El Salvador</td>
<td>Salvadorean Democratic Front</td>
<td>7 1 1979</td>
<td>2 1 1992</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Mozambique</td>
<td>Renamo</td>
<td>10 21 1979</td>
<td>10 4 1992</td>
</tr>
<tr>
<td>Third Frolinat</td>
<td>Chad</td>
<td>Frolinat</td>
<td>3 22 1980</td>
<td>8 7 1988</td>
</tr>
<tr>
<td>Uganda</td>
<td>Uganda</td>
<td>National Resistance Army</td>
<td>10 8 1980</td>
<td>3 19 1986</td>
</tr>
<tr>
<td>Hama Revolt</td>
<td>Syria</td>
<td>Moslem Brotherhood</td>
<td>2 2 1982</td>
<td>2 28 1982</td>
</tr>
<tr>
<td>Shining Path</td>
<td>Peru</td>
<td>Sendero Luminoso and Tupac Amaru</td>
<td>3 4 1982</td>
<td>12 31 1995</td>
</tr>
<tr>
<td>Contra War</td>
<td>Nicaragua</td>
<td>Contras</td>
<td>3 18 1982</td>
<td>4 19 1990</td>
</tr>
<tr>
<td>Somalia</td>
<td>Somalia</td>
<td>Anti-Barre Coalition</td>
<td>4 21 1982</td>
<td>1 27 1991</td>
</tr>
<tr>
<td>Fifth Kurdish</td>
<td>Iraq</td>
<td>Kurds &amp; Shites</td>
<td>1 0 1985</td>
<td>12 31 1993</td>
</tr>
<tr>
<td>South Yemen</td>
<td>South Yemen</td>
<td>Leftist Faction</td>
<td>1 13 1986</td>
<td>1 29 1986</td>
</tr>
<tr>
<td>Second JVP</td>
<td>Sri Lanka</td>
<td>JVP</td>
<td>9 0 1987</td>
<td>12 0 1989</td>
</tr>
<tr>
<td>Second Burundi</td>
<td>Burundi</td>
<td>Hutu</td>
<td>8 18 1988</td>
<td>8 22 1988</td>
</tr>
<tr>
<td>First Liberia</td>
<td>Liberia</td>
<td>NPFL</td>
<td>12 0 1989</td>
<td>11 28 1990</td>
</tr>
<tr>
<td>Ceaucescu Overthrow</td>
<td>Romania</td>
<td>Anti-Ceaucescu Rebels</td>
<td>12 21 1989</td>
<td>12 26 1989</td>
</tr>
<tr>
<td>Second Rwanda</td>
<td>Rwanda</td>
<td>Tutsi</td>
<td>9 30 1990</td>
<td>8 4 1993</td>
</tr>
<tr>
<td>First Sierra Leone</td>
<td>Sierra Leone</td>
<td>RUF</td>
<td>3 23 1991</td>
<td>4 23 1996</td>
</tr>
<tr>
<td>War Name</td>
<td>State</td>
<td>Rebels</td>
<td>Onset</td>
<td>Termination</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------</td>
<td>--------------------------------------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>Croatian Independence</td>
<td>Yugoslavia</td>
<td>Croatians</td>
<td>5 1 1991</td>
<td>1 3 1992</td>
</tr>
<tr>
<td>Georgia</td>
<td>Georgia</td>
<td>Gamsakurdia &amp; Abkaz</td>
<td>12 26 1991</td>
<td>5 14 1994</td>
</tr>
<tr>
<td>Bosnian</td>
<td>Bosnia-Herzegovina</td>
<td>Serbs</td>
<td>3 3 1992</td>
<td>11 21 1995</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>Tajikistan</td>
<td>Popular Democratic Army</td>
<td>5 1 1992</td>
<td>6 27 1997</td>
</tr>
<tr>
<td>Second Angola</td>
<td>Angola</td>
<td>UNITA</td>
<td>10 28 1992</td>
<td>11 22 1994</td>
</tr>
<tr>
<td>First Zaire</td>
<td>Zaire</td>
<td>Rebels</td>
<td>1 28 1993</td>
<td>2 4 1993</td>
</tr>
<tr>
<td>Khmer Rouge</td>
<td>Cambodia</td>
<td>Khmer Rouge</td>
<td>1 29 1993</td>
<td>7 1 1997</td>
</tr>
<tr>
<td>Yemeni Civil War</td>
<td>Yemen</td>
<td>South Yemen</td>
<td>2 21 1994</td>
<td>7 7 1994</td>
</tr>
<tr>
<td>Third Rwanda</td>
<td>Rwanda</td>
<td>Patriotic Front</td>
<td>4 6 1994</td>
<td>7 18 1994</td>
</tr>
<tr>
<td>First Chechnya</td>
<td>Russia</td>
<td>Chechens</td>
<td>12 11 1994</td>
<td>8 31 1996</td>
</tr>
<tr>
<td>Third Liberia</td>
<td>Liberia</td>
<td>NPFL and ULIMO-K</td>
<td>4 5 1996</td>
<td>8 20 1996</td>
</tr>
<tr>
<td>Sixth Kurdish</td>
<td>Iraq</td>
<td>PUK Kurds</td>
<td>8 31 1996</td>
<td>9 7 1996</td>
</tr>
<tr>
<td>Second Zaire</td>
<td>Zaire</td>
<td>Kabila-ADFIL</td>
<td>10 8 1996</td>
<td>5 17 1997</td>
</tr>
<tr>
<td>Congo Republic</td>
<td>Congo Republic</td>
<td>Denis Sassou Nguemo-led Cobras</td>
<td>6 5 1997</td>
<td>10 15 1997</td>
</tr>
</tbody>
</table>
4.3 DEPENDENT VARIABLES DEFINED AND MEASURED

As noted, this project uses the individual civil war as its unit of analysis. Therefore, each civil war is associated with a value for each of the recorded independent and dependent variables. I now turn to the description of these variables. The theory has implications for four dependent variables, all of which are measured: compromise, agreed end, winner, and quick end. These are constructed from an initial set of outcome characteristics for each war. I first define each variable in general empirical terms, then discuss the measures of outcome characteristics and finally operationalize each of the theory's dependent variable in terms of the observed outcome characteristics.

4.3.1 COMPROMISE DEFINED

In the terms of the theory, compromise means an agreement between the rebels and the government to divide control over the stream of resources produced within a state. How might such an agreement appear in the empirical world? Several types of arrangements would offer identical expected utility to the risk-neutral players of the CWTG. First, a formal agreement to share control of the government's powers of resource allocation might be reached. This could be observed through arrangements that divide power between political branches or ministries controlled by the rebels and government. For example, in a country in which the legislative branch was controlled by the rebels and the executive by the government, power might be shifted from the executive to the legislature to some degree. An extreme example of this type of solution is the 1957 agreement between Columbia's rebels and government to take turns at the
country's Presidency. For the next 16 years, the two sides alternated four-year Presidential terms (Clodfelter 1991).

A less obvious way to divide control over the stream of resources may be geographic separation of authority, wherein an area of the country controlled by the rebels is granted autonomy that permits some portion of local or state revenue to be allocated by local authorities. If a rebel-held area becomes fully independent, however, this is not a compromise within the meaning of the CWTG because it does not imply the fusion of military forces and therefore is not followed by the same compliance subgame as compromise. Independence creates an interstate relationship after which the CWTG no longer applies.

A third way in which the parties to a civil war may compromise is through lottery. For a risk-neutral decision-maker (an assumption of the CWTG), an agreement to give the government 90% control and the rebels 10% control is identical to a lottery with a 90% chance that the government controls everything and a 10% chance that the rebels control everything. I am not aware of any cases in which control over a state's resources was actually determined by a coin-flip. Nevertheless, it is possible that a postwar agreement might give each side some chance of securing control over a unitary government through some other mechanism with greater legitimacy than a coin toss. An agreement to hold free and fair elections by both parties would appear to represent such a "lottery" within the meaning of the CWTG. I assume that each party has some nonzero probability of prevailing in an election, and that therefore elections are a mechanism to
divide control over the authoritative allocation of resources through the mechanism of a lottery.

The notion of compromise may thus be captured by the following definition. A compromise outcome to a civil war means that the war is brought to an end by the agreement to or adoption of a system to divide political authority between different organs of the state controlled by parties to the civil war or to hold free and fair elections. Likely indicators of such agreement include: division of power between branches of government such as legislature vs. executive, division of portfolios between ministers representing the government and those representing the rebels, agreement to take turns at controlling the organs of government, local autonomy, and elections. A personal payment to the leaders of the "losing" side does not constitute such a compromise (as such a payment constitutes resources but not control over the allocation of subsequent resources) unless accompanied by measures to divide control.

4.3.2 AGREED END DEFINED

The second dependent variable for which the CWTG contains implications is agreement to end the war. I presume that every compromise meeting the requirements of the CWTG is an agreed end to the war. Governments do not simply deprive themselves of control without at least a tacit bargain with their opponents, undetectable though it may be to the historian. However, not every agreement is a compromise, and I do not assume that every concession made by a winner was the result of prior agreement – it may simply be good policy. Agreement simply means that both sides have found a way
out of the war, whether through compromise or through any other accord in which one of
the parties agrees to lay down its arms. The sides might even "agree" to the
unconditional surrender of one participant, if that side feels that fighting is futile. The
additional theoretical component of agreement over compromise is that it may include
assignment of complete control over state resources to one side. A party's (successful)
surrender or other acknowledgment of its opponent's control over state resources
captures this concept.

4.3.3 WINNER DEFINED

The third dependent variable is winner, which can includes the concepts of
government victory, rebel victory, and "no winner." Victory means gaining control over
the stream of resources produced by a state. Wars that end by mutual agreement are won
by the side that is left with control over resource allocation. Of course, an opponent's
consent is not required to win a civil war; eliminating the ability of an opponent to
contest control over the stream of resources can be accomplished through military force.
This may be indicated by the disappearance of significant military opposition to the war's
victor.

The category of "no winner" includes both wars ended through compromise and those
that result in stalemate. Stalemate appears to capture a number of civil war outcomes: in
some civil wars it appears that combat trails off over a long period of time, leaving no
clear division between a time of civil war and a time of peace. Moreover, neither the
government nor the rebels are able to impose secure control over the stream of resources
produced. The concept of stalemate is simply a war that doesn’t end with compromise or victory.

4.3.4 QUICK END DEFINED

Quick end is the theoretical variable that indicates when a war should end after a single time period. The empirical definition of a quick end to the war is obvious— a war ends before some specified point in time. This can occur because one side is destroyed in one time period of fighting or because the parties reach an agreement that holds.

Obviously what point in time one is evaluating the war becomes critical. Quick End does not measure overall war duration but rather the duration of the war after some point in time when each side makes its decisions. If the model is applied after two years of war, it predicts whether the war will end within one further time period or not.

The CWTG uses abstract time periods to represent the future, so the particular length defined as a “period” is somewhat arbitrary. Given the structure of the theory, this should be well under the average length of a civil war, but is otherwise open to interpretation.

4.3.5 CIVIL WAR OUTCOMES MEASURED

I examine each civil war in Table 4.1 for five outcome characteristics. Table 4.2 summarizes these characteristics and outlines the coding of each. These measures are intended to capture substantively interesting outcome characteristics of civil wars. They
are useful not only for coding the dependent variables of theoretical interest, but also for aiding in decisions about coding and independent variable definition.

**Table 4.2 Initial Outcome Measures**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Code</th>
<th>Coding Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome</td>
<td>Negotiated vs. Military War Termination</td>
<td>1 = Complete military end</td>
<td>Destruction, expulsion, withdrawal, or unconditional surrender of one side</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 = Effective military end</td>
<td>Surrender or withdrawal of one side with promise of amnesty or other guarantees of physical safety</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 = Partial military end</td>
<td>War ends when cosmetic concessions made, but control over resource allocation not divided</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 = Negotiated end</td>
<td>War ends with division of control over resource allocation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 = Stalemate</td>
<td>War does not resolve division over control: fighting continues but drops below 1000 battle-deaths per year</td>
</tr>
<tr>
<td>Formal Agreement</td>
<td>Offer made and accepted</td>
<td>0 = No</td>
<td>Identifiable written or public oral agreement ends war</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Yes</td>
<td></td>
</tr>
<tr>
<td>Victor</td>
<td>Which side prevails, absent stalemate or compromise?</td>
<td>0 = Govt</td>
<td>Outcome = 1, 2, or 3 and this side ends up with complete control over resource allocation relative to its opponent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Rebels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Missing</td>
<td></td>
<td>Outcome = 4 or 5</td>
</tr>
<tr>
<td>Revenge</td>
<td>Postwar massacre of one side by other</td>
<td>0 = No</td>
<td>Does one side massacre substantial proportion of opponents and/or virtually entire opposing leadership after war ends?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Yes</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>Length of war</td>
<td>Number of days</td>
<td>When dates are uncertain, use average of lowest possible duration and highest possible duration</td>
</tr>
</tbody>
</table>
Outcome

Outcome reflects the extent to which a war outcome is military or negotiated. It also reflects the postwar division of control over resources. It is coded as 1 if one side's forces were completely destroyed, expelled, or unconditionally surrendered (no resources at all). The losing side in this case may or may not be killed after the war; this simply indicates that the side gave up without getting anything in return. Outcome is coded 2 if one side surrendered its forces with a promise of amnesty (which is inferred if an immediate grant of amnesty follows a surrender – it may not be a formal agreement, but the expectation of such a move is assumed to exist in such cases). This distinction reflects a very small amount of resources retained (those represented by oneself and one's own work – and the possibility of someday acquiring more). A promise of amnesty may not be honored, but if it accompanied an opponent's surrender the Outcome variable is still coded as 2.

An Outcome of 3 denotes that one side retains control over the allocation of resources, while making symbolic concessions to its opponent. No autonomy, territory, governmental power, or genuine lotteries (i.e. free and fair elections) can be conceded for the outcome to be a 3 – however, a personal payment to the leaders of the "losing" side does not constitute such a concession (as it constitutes resources but not control over the allocation of subsequent resources). A typical "lopsided" outcome like this might provide for increased freedom of worship or the wearing of traditional attire or perhaps freedom from conscription without conceding any control over territory or government functions. If the sides do share the authority to allocate resources in these or other ways
(control over part of the military, an increase in federalism, elections, etc) the outcome is
coded as 4, a "genuine" agreement.

A value of 5 indicates a situation in which both side’s armies continued to exist in
conflict but the fatality level dropped below the threshold of a civil war (in other words, a
stalemate). The conflict has not ended, but the war has.

Formal Agreement

The second variable, Formal Agreement, indicates whether a public oral or written
agreement to end the war was actually followed shortly by an end to the war and appears
to be responsible for it. This may be an instrument of surrender, a simple public
agreement to split power, or a traditional treaty signed by all concerned. This is simply
another way of assessing the degree of mutual agreement to end the war. Examples
include the following situations:

- The Treaty of the Wisconsin brought an end to the War of a Thousand Days in
  Colombia by providing formal guarantees of the physical safety of rebel leaders but
  assigned them no political authority (Bushnell 1993).

- Negotiations held between the Chinese government’s commander-in-chief and the
  rebels in the 1911 First Nationalist Revolution resulted in agreement to form a
  republic but with the commander-in-chief as its first President. The hapless Manchu
dynasty which employed the commander-in-chief was deposed (Hoyt 1989).

- Signed agreements ended the Cristero rebellion in Mexico on June 21, 1930 with
  promises of amnesty for the defeated rebels. Over 14,000 rebels surrendered formally
while the rest simply returned home. Following the surrender, no formal trials were held but about 500 rebels were assassinated (Tuck 1982).

- Leaders of warring factions in post-independence Algeria met early in September 1963 and came to an oral agreement on the nature of the postwar government which ended the war. The two leaders emerged on a balcony to announce the agreement to the crowds below (Humbaraci 1964; Stone 1997).

Oral agreements are not counted as formal agreements unless publicly announced, due to the potential for erroneous coding. An agreement may be as worthless as the paper it is printed on, but if it is signed and ends the war, I consider a formal agreement to exist.

*Victor*

In any war not characterized by genuine compromise over the control of resources or stalemate, there is a victor, the side which ends the war in control of resource allocation. There are no victors or losers coded in a compromise ending, even if one side had somewhat more control over resource allocation before the war than after. It is only when the authoritative allocation of resources is restored to one side or the other that a victor is coded.
Revenge

The fourth coded outcome characteristic is Revenge, which measures the existence of a postwar massacre. Like Formal Agreement, this is another way of assessing "successful" compromise or genuine agreement to end the war. Revenge represents the postwar execution of most of the losing side's leadership or large-scale and systematic massacres of the losing side as a whole. In general, I regard any massacre of a substantial portion of the losing side as a massacre, so although victor-inspired mob killings of dozens of rebels would constitute revenge taken on a loser with hundreds of troops, it would not constitute revenge against a loser with millions of troops. Random crimes and private vengeance taken against a side that numbered in the millions could easily be mistaken for a generalized revenge if I did not apply this standard. Of course, even a dozen executions would constitute revenge if they happened to be the rebel group's leaders. After all, it seems unlikely that this is precisely what the losing side's leadership thought it was getting by halting the war.

Two examples serve to highlight the meaning of this outcome. After the De La Huerta rebellion, which split the Mexican armed forces down the middle, the victorious government ordered every rebel above the rank of major shot (Jensen 1953). In a more ambiguous example, rebelling Asturian miners in Spain agreed to surrender on the condition that the government would withdraw the feared Foreign Legion and Moroccan

---

67 The name Revenge was chosen for this outcome because the concept of retribution occurs frequently in the civil war termination literature and also because it indicates purposive action by the winner of the civil war and not random violence. The name should not be taken as an imputation of motive, for what appears to be revenge may
troops. The government reneged following the surrender, and brutal repression followed (Thomas 1977, 143). Because it appears that the repression was a government policy and because it is also clear that a substantial (though unknown) number of deaths occurred, I consider this to be Revenge.

*Duration*

Duration is measured by the actual number of days of warfare, including the first and last day of a war, and accounting for calendar changes and leap years. Where specific days and months are unknown, I first examine what the minimum and maximum durations given minimum and maximum values of the unknown dates would be, then average those to find the estimated duration of the war. I then select the average start and end dates that would generate a war of this duration as the estimated start and end dates of the war.

### 4.3.6 DEPENDENT VARIABLES AS OPERATIONALIZED

Table 4.3 summarizes how the outcome characteristics of Outcome, Formal Agreement, Victor, Revenge, and Duration are used to code indicators of the dependent variables of theoretical interest. It is the indicators in the third column of Table 4.3 that are used in the empirical tests of Chapter 5. The dependent variables are theoretical concepts: the operational indicators are the measures which represent those variables in simply be fear of the defeated opponent, punishment for war crimes, or attempts to deter others from opposition.
statistical analysis. There are thus a total of 11 indicators that will serve as dependent variables in statistical tests.

Table 4.3 Theoretical Dependent Variables Operationalized

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Description</th>
<th>Operational Indicators</th>
<th>Value: Are following conditions met?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compromise</td>
<td>Shared control over the authoritative allocation of resources.</td>
<td>Genuine Compromise</td>
<td>Outcome = 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mutual Concessions (Secondary Indicator)</td>
<td>Outcome = 3 or Outcome = 4</td>
</tr>
</tbody>
</table>
|                    |             | Degree of Mutual Negotiation (Secondary Indicator) | • If Outcome < 5: Outcome - Formal Agreement - Revenge  
|                    |             |                          | • If Outcome = 5: 2 - Formal Agreement - Revenge |
| Agreed End         | The sides reach a formal agreement to end the war. | Mutual Agreement | Outcome = 4 or Formal Agreement = 1 |
| Winner             | The outcome of the war – either one side retains control over the authoritative allocation of resources, or there is no winner. | Government Victory | Victor = 0 |
|                    |             | Rebel Victory | Victor = 1 |
|                    |             | Stalemate | Outcome = 5 |
|                    |             | Genuine Compromise | See above. |
|                    |             | No Winner | Stalemate = 1 or Genuine Compromise = 1 |
| Quick End          | The war comes to a speedy conclusion after the point of analysis. | Six-Month End | Duration – Day Analyzed <182.62 |
|                    |             | Twelve-Month End | Duration – Day Analyzed <365.24 |
|                    |             | Eighteen-Month End | Duration – Day Analyzed <547.86 |
Compromise

Compromise as understood in the CWTG is indicated by Genuine Compromise, coded one when Outcome is 4 and zero otherwise. A genuine compromise therefore requires divided control over resource allocation.

A secondary indicator of compromise is Mutual Concessions, meaning any end to a war that meets the above definition of compromise and any war outcome in which the winner makes symbolic concessions to its opponent. This includes "lopsided" agreements that do not appear \textit{prima facie} to meet the terms of the theory. A typical symbolic concession might provide for increased freedom of worship or the wearing of traditional attire or perhaps freedom from conscription without conceding any control over territory or government functions. In short, mutual concessions means that concessions have been made by both sides that exceed a mere amnesty or agreement not to massacre the war's losers. The purpose of this second measure is to guard against measurement error in the first, by providing an additional set of cases which are more likely to contain an undiscovered compromise as defined by the CWTG than other types of war outcome. It also takes into account the possibility that what may on the surface appear to an outside observer to be resource-neutral issues such as mode of dress or linguistic rights may have difficult-to-observe effects on the allocation of resources. This measure is coded one if Outcome = 3 or Outcome = 4 and zero otherwise.

Another secondary measure of compromise is Degree of Mutual Negotiation, an ordinal scale variable that attempts to capture somewhat more detail about the war outcome in order to convey which war endings are closest to and furthest from a
genuinely negotiated settlement. I assume the likelihood an agreement occurred is higher as outcomes get closer to compromise, higher if a formal agreement is observed, and lower if the victor takes revenge after the fighting stops. The Degree of Mutual Negotiation is therefore measured as Outcome (if Outcome < 5: otherwise, 2) – Formal Agreement - Revenge.\footnote{I assign a stalemate the value of two because a stalemate leaves some control over resources to each party (much like a compromise) yet does not involve cessation of} Again, it is hoped that these secondary indicators of compromise will serve to guard against measurement error in the preferred indicator.

\textit{Agreed End}

Agreed End is operationalized as Mutual Agreement, coded one if either Formal Agreement = 1 or Outcome = 4 and zero otherwise. I assume that the two sides have reached a bargain if both share authority over the allocation of resources, even if I am unable to observe such a bargain directly. If both sides just fought a civil war over this authority it would be perplexing indeed to have “accidentally” stumbled into peaceful division of control.

\textit{Winner}

Winner, as noted in Chapter 3, involves four states of the world: government win, rebel win, and two types of wars ending with no winner (compromise and stalemate). It is useful for testing my hypotheses to divide these into four dichotomous variables rather than simply having one indicator with four values. The first two indicators, Government
Win and Rebel Win are coded directly from Victor. They are one if the government or rebels, respectively, end the war with control over the authoritative allocation of resources, and zero otherwise. I already have a dichotomous indicator of compromise described above. Genuine Compromise. Stalemate itself is identified by whether Outcome = 5. Because some hypotheses refer to the combined probability of stalemate and compromise, that is the probability that no one wins the war. I also create No Winner, which aggregates Compromise and Stalemate, being coded one if Outcome = 4 or 5 and zero otherwise.

I can thus ask several questions. Who wins? The variables of Government Win, Rebel Win, and No Winner give me the answer. I can also ask about any particular category of war ending: Compromise, Stalemate, Rebel Win, or Government Win. In short, a single dependent variable is represented by five indicators.

Quick End

As there is no a priori reason to pick a particular sub-average war duration as a Quick End to the war, I use several measures. The average length of civil wars in this dataset is just over three years. Given my thinking about the CW TG during construction, a war that ends within one year (or an average of 365.2425 days) is considered a Quick End by one standard, while two other standards use values of six months and 18 months, respectively.

---

hostilities. I therefore assign it a value somewhat closer to military outcomes than to
4.4 INDEPENDENT VARIABLES DEFINED AND MEASURED

There are six independent variables in the implications of the CWTG derived in
Chapter 3. These include force ratio, prior costs, expected costs, discounting, the
advantage to defection, and aggregate expected utility of fighting. As the hypotheses in
Chapter 3 involve only two independent variables – force ratio (including force
contributed by any intervenors) and prior costs – I focus on these. I therefore have six
independent variables in the theory, but only operationalize two of them because only
these are needed to test my hypotheses.

Before examining the mechanics of how each of these two variables is to be
operationalized, it is important to address the time point in each war that is to be used for
evaluating the CWTG. As noted, this is a single-shot game-theoretic model, and so it
needs a time point from which expectations and known variables are to be determined. If
military parity decreases the probability of a quick end to the war (Hypothesis 12), for
example, then testing this proposition involves picking some point during each war to
measure the degree of parity between the sides and then checking to see if the war ended
within 6, 12, or 18 months. And as Figure 4.1 illustrates with respect to communist
rebels in the Philippines, selecting the time period at which to measure military strength
can make a large difference in one’s estimate.
The CWTG only models prior events as they affect each side’s expectations about the future of the war. In this sense, the amount of time passed before the theory is applied is not nearly as important as what transpired during this time. However, the CWTG does assume that the two sides have common information about force levels and costs, as well as common expectations about changes in these terms. This means that the best time to examine a war with the CWTG is after these things have been revealed to the combatants. I therefore attempt to avoid measuring the independent variables at points where they change dramatically by the day or by the hour, as in the opening weeks of some rebellions.
Of course, if I simply measured the end of the war this would not constitute a reasonable test of my hypotheses. Moreover, that point in time to be analyzed with the CWTG should not be at the end of the war, for it is precisely at this point that the substantive importance of its hypotheses is the lowest. Instead, a period as early as possible is desirable from this point of view. These two concerns should lead me to focus on the earliest stable measurement of the force ratio and prior costs that I can find for a war.

A final consideration is in order when selecting the time point within a war to measure the independent variables (and from which Quick End will be evaluated). Since one of the most interesting substantive questions is how an outside actor might alter the outcome of a civil war, it is better to measure the force ratio prior to the onset of external military intervention so that the causal effect of the intervention is clear. This is not always possible. Some civil wars are "born" with intervention, as an external actor whose forces are already present plays an important role in the beginning of the civil war. An example of this is the war of the Khmer Rouge against the government installed by an invading Vietnamese force in 1979; though Cambodia was still independent by COW criteria, the Vietnamese troops formed the backbone of pro-government forces from the very beginning (Clodfelter 1995).

Taking each of these factors into account, I measure the force ratio and prior costs of each side at that point where estimates most closely meet the following criteria, in order of importance:

---

69 If nothing else, this would constitute selection on a dependent variable, since Quick
• Pre-intervention – The point in time represented by the estimates occurs before external intervention.

• Accuracy – The historical source used appears to be reliable, and the estimate to have been carefully considered.

• Consistency -- A single source provides estimates of both sides' armed strength: it is more probable that such an estimate is counting personnel on both sides in essentially the same manner than if estimates are drawn from different authors. Failing this, the two estimates are as close together in time as possible.

• Stability – The initial rapid build-up of forces, if present in this war, has slowed.

• Earliness – The closer an estimate is to the onset of the war, all other criteria having been considered, the better.

In about half of the cases involving intervention, no clear estimate is available for both sides prior to the intervention (especially likely if the intervention begins with the war). Therefore, each independent variable in these cases is measured twice, once using the earliest available data, and a second time using interpolation from this data to known or assumed prewar levels. The estimation procedures used for these secondary estimates are described for each variable below.

_End would obviously be the outcome of every case._
4.4.1 FORCE RATIO DEFINED AND MEASURED

The first independent variable contained in the CWTG’s implications is force ratio. Theoretically, force ratio encompasses everything affecting the expected military performance of each side. For the observer, it may be useful to begin with the sources of military power and proceed to follow the causal arrow until practically observable elements emerge. Military force begins with resources. These resources are probably not observable in any practical sense, as the concept encompasses everything of value to the sides. Allocation of resources produces a "budget" of military power. Resources may be allocated to fielding more troops, equipping them with better weaponry, improving training, strengthening morale through increased pay, developing mobility, and a myriad of other activities that can improve a combatant’s chances in combat. This too is probably very difficult to observe, particularly when it comes to the rebels.

However, combat necessarily involves exposing some portion of one’s military assets to observation – notably one’s local armed strength. If the ratio of the components of military power that are thus exposed by each side is close to the ratio of the less easily observed components, these may suffice for an empirically usable definition of force ratio. One final caveat is in order. There is no compelling system for evaluating weapon quality across long periods of time, and in many civil wars the opposition (and perhaps even the government) is armed with a mish-mash of equipment from different sources, in varying degrees of working order. The armament of each side is, however, less likely to be recorded than the simpler figure of how many troops exist. The empirical definition of
the force ratio is therefore the ratio of the armed troops (no matter how meager their armament) available to the government to the total armed troops involved in the war.

In order to measure this ratio, it is necessary to establish who "counts" as military personnel on each side. While the government army is typically not too difficult to count even before the war, the rebel army is often invisible before the fighting begins. Because it is difficult to know who is a rebel until they fight the government, it is necessary for any measure of relative armed strength to take into account the difference between active fighters and potential fighters. Because potential rebel fighters are difficult to observe, I do not include the reserves of each side until they are mobilized or otherwise committed to the war effort. However, I do include technically nonmilitary personnel who nevertheless take an active combat role, such as gendarmerie or pro-government militias.

Troop level data is coded from various historical estimates of the parties' strength, as illustrated in Figure 4.1. Where one estimate appears to be more accurate than another, I

---

70 The Imam Shamyl, who led the Murids in several rebellions against Russia, had a permanent force of only about 1000 cavalry. However, 20 rebel "provinces" each provided 200 men when needed, quintupling the size of his army on demand (Asprey 1994). Because he frequently called upon this reserve in his seasonal campaigns, I include this information when constructing the rebel strength variable. Had such a system existed without ever being tested, I would not include these rebel "reservists" because they would not have engaged in combat.

71 A force is engaged in active combat if some of its units are used to defend against attacks or conduct offensive operations against the armed enemy.

72 An example would be a heavily-armed security police force such as that employed by the Yugoslav government in Kosovo. Such forces, equipped with artillery and armored personnel carriers, were simply combat troops by another name. Another example would be the Securitate of Romania, secret police forces that were lightly armed but eventually formed the only loyal defense force available to the Ceacescu government (Clodfelter 1991).
use the more accurate one; where I have no basis for comparing the reliability of two sources' estimates for the same point in time, I average them. In each case, what is recorded is the number of armed troops, no matter how badly armed they are (in a few cases, this is a less-than-ideal standard, i.e. when the Taipings fought with swords they were a real challenge to the Chinese government's troops with their obsolete and unreliable muskets, but in the 1930s nearly 5000 Salvadoran peasants with machetes were no threat to even small government formations armed with rifles and machine guns).

Using the criterion of "the enemy of my enemy is my friend." I code all anti-government troops as being rebels and all anti-rebel fighters as being government soldiers. This is true regardless of "official" statements by forces about who they support. In the 1830-31 Albanian revolt against the Ottoman Empire, a Bosnian army of 25,000 marched against the rebels, ostensibly in support of the government. However, when the Bosnians arrived they instead made demands on the government and materially supported the Albanian rebel army even though still formally allied to the government (Malcolm 1994). Had there been no such demands or combat against the government, I would have coded 25,000 additional troops on the government side. Given how the situation developed, I code 25,000 additional rebels when the Bosnians first unite with the Albanians.

A second component of the number of troops on each side is the effect of outside military intervention. Intervention increases the number of troops on each side. This simple addition is captured by adding estimates of the number of troops for each
intervenor to the relevant side, and to the total troops involved in the war. To account for
the possibility that intervenors may send qualitatively different forces to the war zone, I
also code the number of intervenors on each side as well as the simple presence of
intervention. An intervenor is defined as any external actor (whether or not it meets the
definition of a state) that either:

- Primarily fights against (engages in actual combat with) one side in the war
  with forces totaling at least 100 armed individuals.\(^3\) or

- Explicitly allies itself to one side and sends at least 100 armed individuals into
  the civil war state

The first criterion is the usual form of intervention, and allows for offshore
bombardment and naval action to be counted as long as at least 100 armed individuals
fought one side. The 100 troops requirement serves two purposes – it focuses on those
interventions which stand a chance of altering the force ratio to an appreciable extent, and
it makes data collection easier. There is simply more information available on larger
interventions. Take for an example the case of Angola. While the military contributions
of Cuba and South Africa are well known and easily measured, less well-known are a
plethora of smaller states who sent a handful of troops to fight in the war: Congo-
Brazzaville, Nigeria, Guinea-Conakry, and São Tomé and Príncipe, to name a few (Turner
1998). The second criterion allows for the supportive intervenor that guards critical areas

\(^3\) The COW definition of intervention has similar requirements – an intervenor must
send 1000 troops to the combat zone and engage in active combat, or it must suffer at
least 100 battle-deaths. Levy (1988) has noted the difficulty of determining what “active
combat” means and the problem this raises for defining wars. On this issue, I defer to
historical accounts and err on the side of inclusion when the degree of combat is unclear.
for one side but may never be attacked by its opponent. An example of the latter is the deployment of about 100 Zairian paratroopers to Burundi, to which I referred in Chapter 3.

Each war is therefore represented by an estimate of government strength, an estimate of rebel strength, a date for each estimate. In addition, for each side the number of independent groups that represent at least ten percent of the total strength of a given side is recorded. Determining exactly how many troops intervenors have is sometimes difficult, because some interventions take the form of advisors who may or may not actually engage in combat activities. For this analysis, the list of intervenors is pared down to those who committed a minimum of 100 soldiers or advisors who participated in combat operations. For purposes of this study, all interventions for a given side are combined into one estimate of total external intervention for that side, though the number of intervenors is recorded as a separate variable. This is because the theory and empirical choices made above represent the effects of multiple interventions on the same side to be generally additive. I attempt to code intervention at that point in the war when the most intervenors have become involved; otherwise, source reliability is the primary criterion for which estimates of intervenor strength are used. As with the estimates of each side's armed strength, the dates of intervention estimates are also coded.

As previously noted, the intervenor side coding relies on the principle that "the enemy of my enemy is my friend." Intervenors that fight against one side are considered to be fighting for the other side. Intervenors that switch sides are counted as intervening once
for one side and again for the other side. Potential intervenors that attack both sides simultaneously (i.e. the Japanese in China) are not counted as intervenors at all. The theoretical reason is that at this point, the invader threatens the ability of either side to exercise control over resource allocation. I consider such a situation to be an interstate war, not an intervention in a civil war. Fortunately these situations appear very rare – intervenors normally fight on one side at a time and rarely switch sides. Only those armed forces originating from outside the prewar borders of the state are counted as intervenors – internal groups are tracked to identify the total troop levels available to pro-government forces and pro-rebel forces at any time but are not considered separate intervenors.

Government strength is generally known prior to the war – in fact, the COW 10.98 data includes a variable estimating the government's troop strength the year the civil war begins. I modify this appropriately when I know that some proportion of that force rebelled at the beginning of the civil war. That other pro-government forces were available at the time or have some other reason to believe the COW estimate to be

---

74 Such intervention is rare, but does occur. Syria intervened in Lebanon in 1975 to aid the government and Christian Phalange militia against the PLO. However, it switched sides the following year and supported the PLO against the Phalange (Laffin 1986). In inter factional fighting in 1985, Syria was again to turn on the PLO, supporting dissident factions and Druze forces against Sunnis and the PLO (Laffin 1987).

75 An example is the 1993 civil war in Zaire, a rather large mutiny by the 31st Paratroop Brigade which demanded greater pay amidst runaway inflation (Facts on File News Services, World News Digest, March 11, 1993; Sunday Telegraph, April 18, 1993, 26).

76 During the Neapolitan Revolution of 1820-21, rebels soon seized control of most of the country and gained the allegiance of much of the armed forces. However, Sicilians resented domination by the Neapolitan rebels and soon declared independence. While the Sicilian revolutionaries were hardly friends of the aristocratic government, they succeeded in tying up about 32,000 rebel troops on Sicily, leaving only 20,000 rebels on
inaccurate. When initial rebel strength is known, as in the case of some military rebellions or well-documented uprisings, this can also be used as a starting point for interpolation. When no data on the starting strength of the rebels exists, I assume they begin with a single person and build their army from there. In this manner, a secondary force ratio estimate is constructed for every case in which the primary estimate falls after the date of first intervention. Table 4.4 details the construction of an initial strength estimate for civil wars "born" with intervention already occurring.

---

the mainland to face the government and its Austro-Hungarian allies (Romani 1950; Woolf 1979). Similarly, when Austria-Hungary faced its own rebellion in 1848, the rebel Hungarian army was opposed not only by Austrian forces but also by a Croat force of 40,000 under Baron Josef Jellacic, who feared Hungarian domination (Onacewicz). 77 For example, Bolshevik leaders simply abolished the Tsarist Russian Army when they assumed power: by December 1917 the Russian Army had more or less ceased to exist (Somin 1996). In Lebanon's 1958 civil war, the army announced its neutrality, and was therefore unavailable for use by the government until its commander-in-chief was elected President that July (Gloria 1985).
<table>
<thead>
<tr>
<th>War Name</th>
<th>Onset</th>
<th>Description</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unitario Rebellion</td>
<td>1841</td>
<td>Intervention precedes Argentine independence</td>
<td>Pre-independence estimates for both sides used</td>
</tr>
<tr>
<td>Argentine Federalist</td>
<td>1861</td>
<td>Two Chilean battalions assist rebels</td>
<td>Prewar figures known</td>
</tr>
<tr>
<td>Liberative Revolution</td>
<td>1901</td>
<td>Colombian troops join exile invasion by Matos</td>
<td>Initial exile strength (60 men) and prewar government army known</td>
</tr>
<tr>
<td>1st Morocco</td>
<td>1907</td>
<td>French land on opening day of war</td>
<td>Since no fighting between rebels and French until several weeks later, use estimate for rebel strength, and prewar estimate for government strength</td>
</tr>
<tr>
<td>Russian Civil War</td>
<td>1917</td>
<td>German troops protected Ukrainian and Baltic rebels from war's beginning.</td>
<td>Bolshevik (government) army relied on 30,000 Latvian Strelki after abolition of Imperial Army. Prewar rebel strength known for some groups, assumed zero for others.</td>
</tr>
<tr>
<td>Finland</td>
<td>1918</td>
<td>Finland secedes from Russia, whose troops aid rebels in Finland</td>
<td>Prewar government (White) force known. rebels (Reds) interpolated using slope of line describing White build-up.</td>
</tr>
<tr>
<td>Bela Kun</td>
<td>1919</td>
<td>Communist government attacked by Allies</td>
<td>Prewar Hungarian Red Army strength used for government. Rebels interpolated from zero at beginning of Bela Kun's reign</td>
</tr>
<tr>
<td>Greek Civil War –</td>
<td>1944</td>
<td>British troops fought communists</td>
<td>Prewar figures known</td>
</tr>
<tr>
<td>Second Round</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ukrainian People's</td>
<td>1945</td>
<td>War began prior to restoration of Polish independence: Soviet troops fought rebels.</td>
<td>Prewar rebel strength known: I use the 1945 COW estimate for government strength</td>
</tr>
<tr>
<td>Army</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yemeni Royalist</td>
<td>1962</td>
<td>Prewar UAR Troops</td>
<td>Prewar figures known</td>
</tr>
<tr>
<td>2nd Laotian</td>
<td>1963</td>
<td>NVA were in Laos before war</td>
<td>Prewar government army known: rebel estimate interpolated from 1962-3 figures.</td>
</tr>
<tr>
<td>War Name</td>
<td>Onset</td>
<td>Description</td>
<td>Procedure</td>
</tr>
<tr>
<td>------------</td>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1st Burundi</td>
<td>1972</td>
<td>Zairian paratroopers deployed first day of war</td>
<td>Prewar figures known</td>
</tr>
<tr>
<td>1st Angola</td>
<td>1975</td>
<td>Various intervenors before independence</td>
<td>Prewar figures known</td>
</tr>
<tr>
<td>2nd Cambodian</td>
<td>1979</td>
<td>War begins with installation of pro-Vietnam government by Vietnamese troops</td>
<td>Government strength estimated as the size of the Cambodian exile army that invaded with Vietnam two weeks before. Initial rebel strength interpolated from January 1 and January 21 estimates of Cambodian effectives.</td>
</tr>
<tr>
<td>5th Kurdish</td>
<td>1985</td>
<td>Iran fights alongside Iraqi Kurds</td>
<td>Prewar figures known</td>
</tr>
<tr>
<td>2nd Rwanda</td>
<td>1990</td>
<td>Ugandan Army deserters join RPF invasion</td>
<td>Estimated number of Ugandan armed forces subtracted from initial rebel total; prewar government army known.</td>
</tr>
<tr>
<td>1st Sierra Leone</td>
<td>1991</td>
<td>NPLF aids RUF rebels</td>
<td>Prewar figures known</td>
</tr>
<tr>
<td>2nd Liberia</td>
<td>1992</td>
<td>ECOMOG deployed prior to war</td>
<td>Prewar figures known</td>
</tr>
<tr>
<td>Bosnian</td>
<td>1992</td>
<td>War begins with Bosnian independence; Yugoslav Army fights government</td>
<td>Bosnian police force strength used as initial government army strength. Serb members of militia used as initial rebel strength</td>
</tr>
<tr>
<td>Congo Republic</td>
<td>1997</td>
<td>DRC troops. mercenaries</td>
<td>Prewar figures known</td>
</tr>
</tbody>
</table>
4.4.2 PRIOR COSTS DEFINED AND MEASURED

The second independent variable in the implications of the CWTG is the costs associated with fighting. The theoretical concept is very broad, encompassing political costs, military costs, personal costs, economic costs, diplomatic costs, and all other forms of material and social destruction wreaked upon a side by the war. The empirical challenge is twofold: to separate the costs suffered by one side from those suffered by the other, and to be able to identify increases and decreases in such costs.

For example, who suffered by how much when the Chinese government faced a Muslim insurgency in the nineteenth century and responded by targeting all Muslims in the area? The combination of mass death, disease, and an exodus of refugees was so destructive that a century later, the Muslim population was only 10% of the 1860 level (Lipman 1997; Fields 1978). Perhaps 2 of 3 Muslims died (Chu 1966). One author reported that the prewar population of the Shensi province was 700,000 to 800,000 but that after a decade only 20,000 to 30,000 remained. At least 50,000 to 60,000 fled to neighboring Kansu province where most of the refugees died. (Ho 1959). Costs were immense in this war, but missing from this description is anything more than a general idea that the rebels probably suffered more than the government.

Some authors take their studies in the other direction and attempt to capture every dimension of the costs of war. For example, Vincent (1994, 82) assesses the costs of the Mozambique civil war as including:

- 100,000 Mozambicans killed, 95% of them civilians
• $15 billion in economic losses, four times the state's 1988 GDP
• Massive trade deficits
• Dependence on foreign aid
• Depopulation of elephants (from at least 50,000 to 13,000)
• Illiteracy
• Damaged infrastructure
• Damage to at least 45% of schools
• Destruction of 48% of health posts
• 5,000,000 displaced persons, 1,700,000 of them international refugees

Such aggregate measures of war cost are problematic for both practical and theoretical reasons. As a practical matter, they require a great deal of data that is unlikely to be readily available for a large number of civil wars. From the perspective of the CWTG, they also pose difficulties. First of these is that they provide little guidance to the researcher for summing different dimensions of costs and comparing essentially different types of damage. They are closer to attempts to measure expected utility rather than simply changes in the rate of costs. Second, because costs are independent of resource production in the CWTG, it is assumed that differential rates of damage to the resource-production of each side (for example, the destruction of industry or infrastructure) are already captured in their expectations about changes in the military balance. Third, the list does not attempt to separate those costs of war suffered by the parties to it and those costs of war suffered by others in society. It is one's own costs that matter in the prior cost term of the CWTG, not the costs of innocents or third parties.
Examining Vincent’s list in the context of the CWTG’s definition of costs is useful for deciding how to operationalize the prior cost variables. Table 4.5 examines each item in the list. It becomes clear that the term “cost” as used in the CWTG is really referring to a fairly specific type of cost – those that the sides can observe and that directly offset the utility associated with control over resource allocation. Therefore, a narrower empirical definition of civil war costs is required.

**Table 4.5 Generalized War Costs and the CWTG**

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Role in the CWTG</th>
</tr>
</thead>
<tbody>
<tr>
<td>100,000 Mozambicans killed. 95% of them civilians</td>
<td>The sides care about the 5000 battle-deaths suffered by themselves and their opponents.</td>
</tr>
<tr>
<td>$15 billion in economic losses, four times the state’s 1988 GDP</td>
<td>The sides care about decreases in their own resource totals, but as the CWTG assumes a constant present and future value for the resources produced in a period, changes in GDP play no role in the theory. Generalized costs may be one factor affecting the discount parameter – it may be that the sides prefer something now to something later precisely because they know that the country is falling apart around them.</td>
</tr>
<tr>
<td>Massive trade deficits</td>
<td></td>
</tr>
<tr>
<td>Dependence on foreign aid</td>
<td></td>
</tr>
<tr>
<td>Depopulation of elephants (from at least 50,000 to 13,000)</td>
<td></td>
</tr>
<tr>
<td>Illiteracy</td>
<td></td>
</tr>
<tr>
<td>Damaged infrastructure</td>
<td></td>
</tr>
<tr>
<td>Damage to at least 45% of schools</td>
<td></td>
</tr>
<tr>
<td>Destruction of 48% of health posts</td>
<td></td>
</tr>
<tr>
<td>5,000,000 displaced persons. 1,700,000 of them international refugees</td>
<td></td>
</tr>
</tbody>
</table>

It seems likely that deaths from war are an indicator of total war costs observed by and suffered by the participants. The remaining question on formulating an empirical definition of costs is which deaths matter. Given similar theoretical requirements in the realm of interstate war, Bueno de Mesquita (1983) opted to use per-capita battle-deaths as an indicator of costs, arguing that as battle-deaths increase so should the other costs of
war. This is likely the best solution for civil wars as well. In many if not most civil wars the "civilian population" of each side is unknown, even by the combatants themselves. A peasant that appears to be a loyal subject during the day may be secretly feeding or housing rebels at night. Indeed, if civilians are killed in a civil war it may not be entirely clear to the combatants themselves which side has suffered more from the murders. As a general rule, leaders on both sides are most acutely aware of losses among their armed forces. Such losses may well be the indicator that leaders themselves use to assess the overall costs they inflict and suffer. Therefore, I define costs in the context of civil wars as the deaths suffered by each side's armed forces over the course of the war. I use Small and Singer's (1982) coding rule for battle-connected fatalities, which includes those killed in action, those dying of wounds after battle, and those killed by disease during the war.

In the CWTG, the prior cost term is not directly subtracted from the utility of either side. Instead, last period's known cost level is used together with the change parameter to estimate the costs suffered in this and future periods. Therefore, what matters to the sides should not be the total costs suffered prior to some date in the war, but rather the total costs per prior period of war. For this reason, costs are measured by battle-deaths per day.

Having established a theoretical and practical empirical definition of costs, one quandary remains. Should costs be taken as absolute terms or as proportions of some other quantity such as battle-deaths per 1000 people, battle-deaths compared to army size, etc? The question of whether they should be weighted by population or some other factor
is a difficult one. Costs offset the benefits gained from resource control, so presumably in cases with a larger resource pool, it might take more deaths per period to offset the same proportion of it. The CWTG treats the size of the resource pool produced every period as the constant 1, but one might plausibly argue that "1" means different things to the sides involved in different wars. I measure both battle-deaths per time period, per capita battle-deaths per time period, and per soldier battle-deaths per time period, but the latter seems most likely to be a close indicator of the theory's prior cost term.

The same sources are used to estimate casualties as those used to estimate troop levels. Despite my best efforts, casualty data in civil wars is seldom reliable. Sometimes political bias determines casualty estimates. American estimates of rebel battle-deaths in the Vietnam War were routinely inflated by up to 30% and often included civilians (Clodfelter 1995). Often, the exaggeration of casualties by each side is ludicrous. William Bollaert quotes a Carlist writer's summary of the difficulty of estimating casualties in the First Carlist War:

"There was not much to choose between either party as to the veracity of their dispatches. On one occasion 45 bodies were counted after a great battle, when 3000 were put in the Cristino 'Gazette' as hors de combat. In a Carlist bulletin, after Cordova's retreat to Vitoria, it was declared 9000 had been destroyed out of 12,000, when not more than 60 bit the dust" (Bollaert 1870, 213).

In many cases, all that are available are casualty numbers rather than battle-death figures. Casualties often mean both dead and wounded. Fortunately, there are some techniques for estimating battle-deaths given casualties. Clodfelter finds that there is a usual 3:1 ratio of wounded to killed (1991, 1086). Bodart (1916) found that in nineteenth
century wars, there were about 10 killed for every 35 wounded in battle, but 10 to 15 percent of those classified as "wounded" later died of wounds, producing a final ratio very close to 1:3. Livermore (1957) found a "usual ratio of killed to wounded of 1 to 2.5" in the American Civil War. And although Voevodsky (1969) found that for the United States, the ratio of battle deaths to battle casualties (excluding disease from both categories) varied not only between wars but also over time within wars, especially in the case of the Vietnam War, others argue for more consistent relationships. Dupuy, examining studies of wounded to killed in ancient battles to the modern era terms the ratio of wounded to killed "one of the most consistent relationships in battle statistics" (1990, 48-9). The number of wounded per combat death is listed for a number of wars: 2.1-2.2 (ancient battles), 1-2.6 (Germans in Franco-Prussian War), about 4.4 (several wars from 1704-1871), 2.18 (US in Mexican War), 2.38 (Union in American Civil War), and ratios of 2.41 to 4.16 in later American wars. Dupuy concludes that, on average, the historical relationship appears to be about 3 wounded for every 1 killed in combat. Given the widespread agreement on this standard, and the fact that it closely resembles the standard used by COW to estimate battle-deaths from casualty data (which was based on many of the same sources -- see esp. Singer and Small 1972, 49-50), I use this rule to estimate battle-deaths when only casualty estimates are available.

Counting deaths from disease is theoretically consistent and retains consistency with the COW dataset, but also poses data problems. These problems are nothing new, as Singer and Small faced them as well. Disease is frequently a far more efficient killer than battle. When Russia intervened in the 1848 Hungarian revolt, it lost only 708 soldiers to
the rebels but lost 10,885 to disease (Onacewicz 1985). A series of epidemics in areas of combat between China and Miao rebels in the summer of 1865 slew perhaps 30% to 40% of area government forces and killed 10,000 Miao in one prefecture alone (Jenks 1994). Where a reasonable estimate of deaths from disease exists, I include them, but where I have no estimates there are few options. If officer deaths are known, one can extrapolate total enlisted deaths from them because officers typically suffer higher casualties in battle but fewer losses to disease (Singer and Small 1972, 50).

As a result of these factors, battle-death estimates, while certainly better than mere guesses, are nevertheless prone to inaccuracy or missing altogether in many cases. I was able to estimate government battle-deaths in 112 wars and rebel battle-deaths in 99, or just over half of the cases. Of these, 92 civil wars have comparative estimates of battle-deaths suffered by each side.

Since prior costs provide each side information regarding expected costs, I attempt to measure prior costs at the point in time of the estimate of the force ratio – that is, how many battle-deaths each side had suffered prior to the date of the force ratio estimate used for that war. Obviously, this means there are two prior cost estimates for those wars in which there are both primary and secondary (pre-intervention) force ratio estimates.

Where the actual number killed on a side prior to the time point of analysis is unavailable, I estimate the costs of fighting prior to that point by interpolating from zero casualties on the first day of the war to the total casualties by the last day of the war for a given side, and using the proportion of casualties expected to fall before the date of the force ratio estimate. Thus, if the rebels in a year-long war lost 10,000 troops and the
force ratio was estimated at the mid-point of the war. I would code the rebels as having lost 5000 troops to that date.

If comparative battle-death data for the entire war exists but only combined battle-deaths are available as a measure of prior costs, I apportion the total battle-deaths suffered up to the point of analysis to each side in proportion to the total casualties each side suffered over the course of the war. Finally, if no comparative casualty data exist for a war, I estimate prior costs by assigning half of the total battle-deaths in the war to each side and then interpolating as above to get the estimate for each side at the point of the force ratio estimate. Naturally, I preserve the changes made at each step of this process in a separate variable so that data manipulation doesn't obscure relationships.

4.4.3 EXAMPLE: FORCE RATIO AND COSTS IN RWANDA, 1964

For an example of the coding process for a typical case, take the 1963-4 Rwandan civil war between governing Hutus and rebel Tutsi. COW codes the war as beginning on November 15, 1963 and ending on February 6, 1964. The first combat for which I have information occurred in late December, when Tutsi exiles attacked Rwanda with four forces. The first two attempted to cross into Rwanda from Uganda. One of these was turned back by Ugandan authorities, but the other force of about 600 men made it into Rwanda. Once there, the bow-and-arrow-wielding rebels suffered 300 battle-deaths. A third attack from Tanzania failed. The most successful attack was launched from Burundi, with anywhere from 80 to 300 troops. This force quickly swelled to 1000 and was defeated with the loss of several hundred Tutsi lives, most of them civilians.
Following the defeat of this force, the government and allied Hutu militia massacred anywhere from 10,000 to 14,000 Tutsis (Lemarchand 1970). There was no military intervention meeting my criteria.

Tilemma (1991) gives the rebels' strength at 1500 troops invading from Burundi. Simply adding up the peak in-country strengths of the rebels given in 517-3 generates an estimate of 680-900 at the onset of the war and up to 1600 later. If one accepts Tilemma's estimate of the Burundi force and adds to that the estimate of the force from Uganda, one arrives at 2100 rebels. However, it is possible that Tilemma was referring to the strength of the entire rebel army, unaware that only a portion of it came from Burundi. Since Tilemma's estimate is very similar to the estimate one would get by adding the peak strength of all the rebels in Rwanda, I use his figure. As for the government, I use the COW estimate of 1000 troops. The result is that the government controls 1000 out of a total of 2500 troops, a force ratio of .4.

The time point being analyzed is clearly after late December, but before the rebels were decimated. It appears to fall within January and without any guide to a specific date within that month, I use the date of January 15, 1964 as the date of the force ratio estimate.

Now I turn to estimating costs. Because the government's battle-deaths are really unknown, I cannot say with any certainty that less than 1000 fell in battle, nor can I determine that the rebels suffered more than 20 battle-deaths for every government battle-death. I therefore retain this case as a civil war. COW codes 2500 battle-deaths for this conflict (ostensibly on the government side), a figure which, according to Small and
Singer (1982), was gathered from Taylor and Hudson (1972). This source codes 21,000 domestic deaths for Rwanda in 1964—presumably the COW researchers were able to disaggregate those occurring before February 6 by accessing the full data tapes of the Taylor and Hudson dataset. Given the nature of the data, I conclude that the 2500 figure is actually taken from an estimate of total deaths, not just government deaths. This also seems likely given the small number of government soldiers.

Armed with this information, I add the rebel battle-deaths together: 300—"several hundred, mostly civilians." Given that Taylor and Hudson measure deaths due to political violence and not battle-deaths per se, I conclude that the COW estimate is of total war deaths and not merely those of combatants. That being the case, I can assume that civilians with the Tutsi rebels "count" for battle-deaths in the COW estimate, and so I can obtain the proportion of the deaths that were pro-rebel by adding 300 to "several hundred."

As a rule of thumb, authors are more likely to exaggerate than underestimate deaths in civil wars, assuming they do not have an axe to grind. I therefore have operationalized "several" as "two" whenever deaths are being counted and the authors leave no other clue as to the exact figure.78 I thus estimate 500 rebels died out of 2500 total deaths, a ratio of 500 rebels to 2000 government deaths. The resulting estimate is little better than guesswork—probably accurate to some degree for the rebels, but probably inaccurate for the government, given the armament of the rebels. the fact that the government won the

---

78 Similarly, "hundreds" of deaths would be coded as 200, "a few hundred" is coded as 300, etc — I attempt to avoid such measures but where they are the only extant estimates, I code the lowest number reasonably consistent with the author's description.
war militarily (Formal Agreement = 0, Outcome = 1, Victor = 0) and proceeded to massacre all the Tutsi it could get its hands on (Revenge = 1), and that 2000 is double the strength of the prewar government army.

Ordinarily, COW includes the initial postwar massacre of losers by the victors in its battle-death estimate for civil wars (Small and Singer 1982) but in this case, they seem to have tried to separate prewar and postwar deaths, so this probably is not the source of the problem. Instead, the difficulty probably lies with trying to combine data from one source that tends to count military deaths and another source that really is interested in total domestic deaths. In short, coding casualties is particularly difficult, and the Rwandan case is close to the median on this dimension (hence nearly half of civil wars have no separate estimates for government and rebel battle-deaths).

4.5 SUMMARY

Using and augmenting the best available definition of civil wars, I construct a list of 197 civil wars beginning after 1816 and concluding before 1998. For each civil war, a point in time is selected which best represents the conditions under which the CWTG operates, given the available data. For this point in time, I measure the number of troops on each side and the prior battle-deaths suffered by each side. I also measure the strength of subsequent military intervention on each side. In some cases, military intervention precedes a reliable estimate of force strength. For these cases, I estimate force ratio and prior costs for a pre-intervention time point. Though this estimate is likely to prove less reliable, it is better suited to evaluating the effects of subsequent intervention.
Therefore, every war is represented by one or two points in time near the war's onset. from which the independent variables are measured. Each war is examined for its outcome characteristics: presence of compromise, agreement to end the war, military outcome of the war, and whether the war ends within 6, 12, or 18 months from the time point examined. The use of multiple measures for most variables of interest helps to safeguard against errors in the data. What remains is to use the dataset to evaluate each hypothesis in turn.
Appendix 4.1 – Recoding COW Multiple-Phase Civil Wars

*Second Syrian –* As over a year passed between the first and second phases of this civil war, the war would be recoded as two separate conflicts, with the dates of the second war being the original dates of the second phase of the war. However, the second half of this war was primarily fought between Turkey’s allies and the rebels. At least 1500 rebels were killed in the main action of the war, a naval bombardment by a Turkish-Allied fleet in which only 2 government soldiers died (Clodfelter 1991). As such, it appears that the rebels failed to inflict at least 5% of their own fatalities on the government. Therefore, the first half of this war is retained as a civil war, but the second half is not.

*Second Two Sicilies –* Because less than one year separated the phases of this war, it is treated as one war with a termination date given by the COW end date of its second phase.

*Second Venezuela –* One year separated the two phases of this war; thus it was divided into two wars.

*Mexican Revolution –* This war is complex, because the government changes hands a number of times. Using the coding rule that a war ends when the government is destroyed, I have divided this war into several separate wars. The first of these begins with the rebellion of Madero and has a beginning date identical to the COW beginning date. Madero is soon joined by armies under Zapata and Villa. This war ends on June 7, 1911 when Madero takes control of the government after Diaz is ousted.
On August 30, 1911 Zapata revolts and a second civil war begins. Villa assists the government for a time before his force is crushed and Gen. Orozco mounts an unsuccessful rebellion against the Madero government. In 10 days known as La Decena Trágica. Madero faced a revolt by cadets and ultimately the defection of his commander-in-chief Huerta with the national army. The Madero government is overthrown and replaced by one headed by Huerta. As La Decena Trágica involved a new rebellion of right-wing loyalists of Diaz rather than Madero’s left-wing revolutionary opponents, and since Huerta did not declare his opposition to Madero until deposing and arresting him, I regard this as a coup by one member of the regime against another member of the regime rather than a rebel win, and so the war continues against the same opponents as before (with the addition of a Constitutionalist army that revolts soon after Huerta’s seizure of power) until July 15, 1914 when the government is militarily defeated by an alliance of rebel groups and Huerta resigns. The new President is Constitutionalist leader Carranza.

Combat ceases from July 15, 1914 to December 1, 1914, when a new revolt led by Zapata and Villa begins. This is the third civil war of the Mexican Revolution. Although the nation’s capital changes hands several times over the next four months, I identify Carranza as the government since he began the war as President and controlled the capital for the bulk of the war. While Carranza’s forces succeeded in defeating most of the rebels, his own supporters revolted in April 1920, ousted him from power, and made peace with the sole remaining rebel army headed by Villa. Again, I regard the seizure of power from Carranza (which appears to have involved very little combat) as a coup within the government not as an overthrow by the rebels, who were not involved in any
way. The war ends with the agreement of July 28, 1920 between the government and Villa. Note that the COW termination date for the war was May 21 of that year. when Carranza was assassinated by his bodyguard as he slept.

*Greek Civil War* – Nearly two years separated the two phases of this war; thus it is recoded as two wars.

*Ogaden* – This war was divided into two phases only because Somali intervention on behalf of the rebels was large enough to trigger an interstate war between Ethiopia and Somalia. As combat continued throughout this period, this is retained as a single war (and later combined with other ethnic rebellions in Ethiopia – see Appendix 4.2 for details). The ending date of this war is that of the second phase of the war in the COW list.
Appendix 4.2 – Consolidation of Simultaneous Civil Wars in the Same Country

Greek Independence and Janissary Revolt – Although the Janissaries were hardly allies of the Greeks (indeed, it was their abject failure against the Greek rebels that was partly responsible for their downfall) the fact remains that at the time of their revolt, they were fighting the Sultan, as were the Greeks, and neither group was fighting the other. To the extent that the Janissary Revolt meets the criteria of a civil war it is combined with the Greek revolt.

Murid Wars and First Polish – These are combined (though the Murid Wars are broken into several civil wars upon consideration of new historical data in Appendix 4.5) according to coding rules, even though they were completely separate geographically.

Hungarian and Viennese Revolts – The Hungarian army actually marched to the aid of the Viennese, though it was defeated. These are regarded as one war.

Taiping, Nien, Miao, and Muslim Revellions – These Chinese revolts not only overlap chronologically, but in some cases also geographically. At least some coordination occurred among these various rebel groups and certainly government forces used to defeat one had to be stripped from combat against another. Thus these four groups are considered to be the rebels in a single civil war.

First and Second Brazil (Rio Grande do Sul and Naval Royalists) – Defeated Naval Royalists joined forces with the rebels of Rio Grande do Sul, making this a single war in fact as well as by coding rules.
Druze and Third Cretan – It is not clear when during the year the Druze revolt occurred. Since this means that whether it occurred simultaneously with the Cretan revolt is unknown (though probable, since the Cretan revolt began in February and lasted past the end of the year), these two revolts are treated separately. As they were widely separated by geography and apparently unconnected politically, this is also probably an accurate historical depiction.

Russian Civil War and Green Rebellion – There was substantial coordination and communication between White armies and the “Green” armies led by Antonov. In addition, a series of other peasant rebellions occurred at about the same time. The historical evidence suggests that the “Green” rebellion was just as coordinated as the several “White” rebellions. These are combined into one war by coding rules.

Chinese Muslims and KMT – Although COW has only a year for the Muslim rebellion, historical research places it in the spring of 1928 and thus during the KMT revolt. Therefore it is combined with that of the KMT.

Chinese Civil War and Taiwan Revolt – The Taiwan rebellion is entirely subsumed within the Chinese Civil War.

Cristero and Escobar Revolts – Although uncoordinated, these two rebellions interacted as pressure on the Cristeros was relieved by government action against the Escobar rebellion.

First and Second Guatemala – The revolt of Guatemala’s Leftists and Indian groups were initially uncoordinated, though eventually some common action occurred. In any event, they were simultaneous threats to the government.
Moro and NPA Rebellions – These two groups occasionally worked together during this long civil war.

Eritrean, Ogaden, and Tigrean Revolts – Coordination between these armies was strong, particularly between Eritrean and Tigrean rebels, who launched coordinated military actions. This was a single civil war with multiple ethnic armies.
Appendix 4.3 – Recoding COW Civil Wars Ending in Interstate or Extranational War

Spanish Royalists – Evidence indicates that the rebels were still fighting when France intervened massively on their side (Esdaille 2000; Pierson 1999). The new ending date is that given for the interstate war between France and Spain, which culminated in the overthrow of the Liberal Spanish government and the re-installation of King Ferdinand.

Greek Independence – Although the COW 10.98 data does not code this war as ending in interstate war, it places the end date at April 25, 1828 -- the day before the Russo-Turkish War begins. Since the rebellion continued into this period, the end date of the rebellion is changed to the end date of the Russo-Turkish War, which secured independence for Greece.

Balkan – Though not coded as ending in interstate war, this war's termination date is identical to the onset date for another Russo-Turkish War. Complicating matters is the fact that Austria intervened, initially on the side of the rebels but eventually to establish its own control over the rebel area. An extra-state war resulted between Austria and the rebels. I code the end date of this conflict as the end date of the Russo-Turkish War, for it was at this point that the Ottoman government lost control over the rebel area. Moreover, there was an actual respite from fighting in the aftermath of this war, so this is a sensible ending date for an extremely complicated war.

Third Cretan – Though again not coded as ending in interstate war in the 10.98 dataset, the final day of the civil war is identical to the initial day of the Greco-Turkish
War and therefore the termination date of that war is used as the termination date for this civil war.

*Second Morocco* – The COW System Membership dataset codes Morocco as losing its independence on May 2, 1911, but the 10.98 civil war data codes the termination date for this war as June 10, 1911. Because I have opted to exclude wars in which the government becomes a puppet of a foreign power, I exclude this war from my analysis as the country became a colony before the civil war was able to terminate.

*Vietnam War* – Certainly, both government and rebel forces continued to fight past the 1965 start of the interstate Vietnam War: while the rebels were substantially weakened after their 1968 Tet Offensive, they continued to field armed units up to the end of the war in 1975. North Vietnamese and American interventions were massive, but neither the government nor the rebels ceased to exist as military forces during the 1965 to 1975 period.

*Bangladesh* – The Indian armed forces intervened decisively on the side of Bengali rebels, while India and Pakistan simultaneously fought a war on their common border. The Bengali rebels were able to take power in Bangladesh following military action.
Appendix 4.4 – COW Wars Excluded Because COW Criteria Not Satisfied

*El Salvador (1932)* – The rebels, armed with machetes, inflicted few casualties in battle, though they did execute a number of prisoners. In total, only 20 guards and police were killed, while the government annihilated not only the rebels but also a large number of Indians in general (Anderson 1971). Other authors agree, estimating deaths caused by the rebels at 6 to 30 (White 1973), “at most” 100 when the rebels lost 2000 to 20000 (Parkman 1988), or 20 to 40 (Parkman). Only Clodfelter disagrees, citing 70 to 100 government deaths (Clodfelter 1991); given the other estimates and evidence that most people killed by the rebels died from execution when unarmed 1 discount this figures sufficiently to place government battle-deaths below the 5% effective resistance threshold.

*Austria Socialist Putsch* – This COW war combines two quite distinct events into a single civil war against “socialists.” The first is the February 1934 conflict between the government and socialist workers’ militias, while the second is an uprising by National Socialists (i.e. Nazis, who were adamantly opposed to left-wing socialists) in July 1934. This conflict fails to qualify as a civil war, for government battle deaths were between 115 (Clodfelter 1991) and 118 (Gulick 1948), while rebel battle deaths were 196, including some civilians (Clodfelter 1991). While Gulick indicates that there were 1500 to 2000 socialist deaths, it is clear from the description that most of these were unarmed civilians; the militias’ mobilization had been cut short. The workers’ militias were crushed by the end of February. The second conflict is the July 1934 “lightning coup.”
which took place after several months of peace and involved a completely different set of actors. This event also fails to meet the COW definition of a civil war, as only about 269 people were killed (Carstein 1986; Kindermann 1988). Even if the two distinct rebellions are combined, one arrives at a total of 583 deaths, well short of what is necessary for a civil war.

Trujillo Revolt – The COW estimate for battle-deaths is 2000, but as noted this estimate includes deaths from any immediate postwar massacres. Since this study does not include deaths after fighting has stopped (save those who later die of wounds sustained during fighting) the war was re-evaluated. Though evidence is fragmentary, it appears that actual combat caused less than one thousand deaths. Instead, most deaths were due to an initial massacre of imprisoned government officers and a much worse massacre of rebels and pro-rebel civilians (perhaps 1000-1500 executions) after their surrender (Stein 1980; Klarén 1973; Pike 1967). Since Clodfelter (1991) lists 1000 to 2000 total deaths from all causes, it would appear that battle-deaths were well below the necessary threshold. A dissenting source is Marett (1969), which suggests a figure of 1000 to 2000 “casualties” before the mass executions began. Because Marett only estimates 44 deaths by execution, because “casualties” may mean either deaths or the combination of dead and wounded, and because the only estimate of rebel strength in the actual area of combat caps their size at 600 (Klarén 1973). Marett’s estimate is not considered credible with respect to battle-deaths.

First Guatemala – The 1954 overthrow of the Arbenz government by US-backed rebels involved very little bloodshed. The CIA ran a propaganda campaign broadcasting
about non-existent battles to make it appear that the rebels were much more numerous than they were (Jonas 1991). Nevertheless, only a handful of people died in fighting—perhaps 100 casualties on both sides (Clodfelter 1991).

Chilean Coup of 1973 – Excluded because COW estimates included 8000 battle-deaths but only 100 among rebel (Pinochet) forces, falling short of the necessary 5% ratio. In addition, my research found that almost all of the deaths counted by COW were in fact postwar executions and not combat-related fatalities. Not a single military unit supported the government aside from the palace guards and disorganized worker’s militias (Alexander 1978); as the palace guard only amounted to fifty men (Roxborough, O’Brien and Roddick 1977) this cannot be the source of more than 50 battle-deaths on the government side. Indeed, a Chilean general was able to identify less than a dozen rebels who died (Ensallaco 2000). One historian (Clodfelter 1991) calls estimates of 400 rebel battle-deaths and 100 government battle-deaths exaggerated, and also questions the figure of 8500 total deaths. Another author estimates 3000 to 30000 deaths but again appears to include executions in this figure (Angell 1984). The latest available data suggests 1260 deaths in the rebellion and the following two months, most of them executions (Ensallaco 2000).

Nigeria 1980 – Excluded because effective resistance implausible given that most rebels armed with only bow and arrow (Clodfelter 1991; Isichei 1987), and rebel fatalities are about 5000 (Hickey 1984) out of a total of about 4700 to 6000 deaths (West Africa, March 12 1984, 539; Isichei 1987; Loimeier 1997). While Clodfelter (1991) offers an
estimate of 50 government battle-deaths (among police). his estimate of rebel deaths is
1000 to 7000, making it unlikely that effective resistance occurred.

_Nigeria 1984_ -- Excluded because rebels inflicted only 7 deaths on government police.
thus failing to meet the effective resistance criterion,\textsuperscript{79} and because it is unlikely that
1000 battle deaths occurred given detailed casualty reports\textsuperscript{80} and the fact that most rebels
were armed with machetes and axes.\textsuperscript{81} though a few authors do indicate that up to 1000
deaths may have occurred – Isichei (1987) estimates 500 to 1000 at one point and 700 to
1000 at another. The most detailed accounting appears to be a complete one and reports
a total of 743 deaths.\textsuperscript{82}

_Pakistan vs. Mojahir_ – Excluded because less than 1000 combined battle-deaths
during the dates given for the war. While more than 1000 deaths occurred in Pakistan in
this time period, many were from internecine warfare between different political factions
not involved in the war and a substantial number were incurred in police custody
Rashid 1996).

\textsuperscript{79} West Africa. March 12, 1984. 539; West Africa. March 18, 1984. 636; West Africa.
\textsuperscript{81} West Africa. March 5, 1984. 527
\textsuperscript{82} West Africa. April 2, 1984. For more details about how this estimate was obtained, see
Appendix 4.5 – Changes to Civil War List Resulting From Historical Research

Entirely New Wars
The research process uncovered a number of wars appearing to fit the coding rules of this study:

- Chile (Chile vs. Fusionists and Miners. December 12, 1858 – April 29, 1859):
- Kanto Insurrection (Japan vs. Mito rebels. June 6, 1864 – Dec 31, 1864)
- Cacos Revolt (Haiti vs. Peasants. June 1867 – January 15, 1870)
- Boshin War (Japan vs. Tokugawa. January 2, 1868 – May 1869)
- Tonghak Rebellion (Korea vs. Tonghak Society. February 1894 - February 1895)
- Forest Brethren (USSR vs. Lithuanians, Estonians, and Latvians. 1944-1952)
- Ukrainian People’s Army (Poland vs. UPA. June 12, 1945 – March 1948)
- Hama Revolt (Syria vs. Moslem Brotherhood. February 2, 1982 – February 28, 1982)

Changed Wars
Russia vs. Georgians – This 1816-1817 conflict probably did not rise to the level of a war because there were few battle-deaths (Baddeley 1908, Clodfelter 1991). However, in 1818 Chechens and Dhagestanis joined the revolt, and battles were fought between the rebels and government forces. Although the Chechens and Dhagestanis were largely
subdued in August 1820, by then another revolt had broken out among the Imereti in Georgia which spread to the Abkhazia region. This revolt lasted until 1822 (Lang 1957). There was a new Chechen revolt in 1824, but this was crushed by a series of massacres in 1825 and in the absence of battle-death estimates I do not count this revolt as a civil war (Baddeley 1908). The dates of this civil war are thus 10 June 1818 to 1822, and it is retitled First Caucasus given its geographic scope.

First Two Sicilies – As the only major battle of this war was fought on March 7, 1821, the COW termination date of March 3 is premature. I use the date that the capital fell, March 23, 1821, as the termination date of this conflict.

Murid Wars – I divide this war into three wars based on the information in Onacewicz (1985), Gammer (1994) and Clodfelter (1991). The first war began at the beginning of 1830 with a revolt led by Ghazi Muhammed. It is this war which overlaps the COW First Polish rebellion, and a heretofore unrecorded rebellion of 60,000 Moldavian peasant rebels in 1831 (Goldstein 1983). The death of Ghazi and most of his army in September or October 1832 ended this war, which I term the First Murid-Polish war (Onacewicz 1985, Gammer 1994). The second war began in early 1834 when Ghazi’s successor, Hamza Bek, assembled a new rebel force and attacked the Russian troops once again (Onacewicz 1985). Though he was quickly killed, his successor Shamyl continued the war until an agreement of some sort was reached with the Russians around the end of 1834, concluding the Second Murid war (Gummer 1994). The Third Murid war began when the government launched an attack on the rebels in the summer of 1836 (Gummer 1994). Despite the fact that Shamyl surrendered in 1838 (Onacewicz 1985) the
government remained busy with other rebellions in Daghestan until Shamyl was able to rebuild an army and once again attack the government the next year, inflicting heavy losses. From this period forward, there was either a new rebellion or government offensive every year until about 1852, shortly before the outbreak of the Crimean War. and battle-deaths continued to average well over 1000 per year during this period (Gammer 1994, Onacewicz 1985; Clodfelter 1991). Although Shamyl did not finally surrender and accept exile until 1859, there is no evidence that over 1000 people were killed in his subsequent rebellions (Gammer 1994). Therefore I code the Third Murid war as beginning in summer 1836 and ending in 1852.

**Greek Independence** – The original COW dataset opted to exclude the Battle of Navarino Bay. Since the initial dataset was formulated to analyze intervention choice rather than intervention effects and it was not clear that the states opposing the Ottomans actually intended to get involved in such a manner, this was appropriate. However, because the battle is regarded by historians as a turning point in the war, and because this study is concerned with the effects of intervention on the outcome of civil wars (regardless of the motivation for the intervention) I do not exclude this intervention from the war.

**Belgian Independence** – The COW dataset records only the year 1831 as the date of termination. I code the termination date as December 23, 1831 when Antwerp finally capitulated to the Belgian forces, as this both ended combat and formed a historically recognized end to the war.
Second French Insurrection (June Days) – While the COW dataset records this revolution as beginning on February 22, 1848 and ending June 26, 1848, this combines two different rebellions. The first was a small-scale affair that does not appear to meet the COW threshold for a civil war. It was the revolt against the French monarchy by Republicans and Radicals. The second event was the subsequent revolt of Radicals against the bourgeois Republic from June 23 to June 26 (Clodfelter 1991). It was during this phase of the conflict, under a different government than the first, that the bulk of killing occurred. Therefore, I code this war as beginning on June 23 1848 and ending on June 26 1848. The government side is thus the Republicans rather than the monarchy.

French Royalists – COW lists the dates of this war as 0/0/1851 to 12/0/1851 and codes the rebels as Royalists. This two-day conflict was sparked by the December 2, 1851 coup of then-President Napoleon III and subsequent rising by Republicans. Given that the coup occurred prior to the counter-rising by Republicans, that Napoleon was already President before the coup, and that the French Army was commanded by Napoleon III in the conflict, I code this conflict as a rebellion by Republicans against the new regime of Napoleon III beginning on 12/2/1851 and ending on 12/4/1851 (Clodfelter 1991).

Second Buenos Aires – COW only has a year for this war, 1861. Combat began after the expiration of a five-day truce that began August 15, 1861 (Jeffrey 1952). Combat ceased with the beginning of negotiations on December 2, 1861. I therefore use August 20, 1861 as the onset date and December 2, 1861 as the termination date.

First Morocco – Ending date changed from August 19, 1908 to September 1, 1908 because a final battle was fought on the latter date (Burke 1976).
Yunnan – The 10.98 dataset only provides the years for this war, 1917-1918. This war is very complex, with shifting allegiances between major leaders of “rebels” and “government” factions. Yunnan and Kweichow provinces declared independence in January 1916. After bitter fighting in Szechwan and the defection of Lu Jun-t’ing, the military commander of Kwangsi province, virtual independence for the southern and southwestern provinces was obtained (Lary 1974). Although there was a substantial pause between this initial bout of warfare and Sun Yat-sen’s revolution following the Chinese government’s declaration of war against Germany in 1917, it was in Canton, under Lu’s control, that Sun Yat-sen proclaimed a new Chinese government under his leadership (Scalapino and Yu 1985). Moreover, the pause appears to have been well under twelve months, though there is no clear date for the cessation of hostilities in the initial part of the conflict. After Sun’s proclamation, the civil war was one of South against North (Scalapino and Yu 1985). There were multiple realignments of regional forces in the war, but given that the match-up appears to have more or less continuously pitted forces associated with the South against those associated with the North. I regard this as a single civil war beginning in January 1916. Since an armistice was signed on November 17, 1918. I use this as the termination date for the war (Scalapino and Yu).

Chinese Communist – COW gives a termination date of October 15, 1935 for this war, but in fact only Mao’s portion of the Long March had been completed. In 1936, an 80,000-strong Communist force marched from Sikang to Mao’s forces at Shensi, suffering 20,000 deaths along the way (Clodfelter 1991). It appears that low-level combat continued throughout the year 1936, until the government’s army forced it to
come to terms with the rebels in December 1936 so that a common front could be built against the Japanese (Clodfelter 1991). Accordingly, I code this war as ending in December 1936.

**Soviet-Turkestanis** - COW lists the dates for this war as 1931 to 1934, and the rebels as Soviet Central Asians. There were a number of disturbances in the Soviet Union in the early 1930s. The first of these that I have located is a March 29, 1929 infiltration by Ibrahim Bek and 600 Basmachi troops of Tadjikistan from Afghanistan; this was followed three months later by an attack buy Dzunaid Khan from Persia to Turkmenistan (Nahaylo and Swoboda 1990). Fighting continued until the destruction of this force near the end of 1931 (Nahaylo and Swoboda 1990; Rezun 1992). Though sporadic resistance continued after this point -- Mawdsley (1987) says the last Basmachis were destroyed in 1933 and Ritter (1985) says small-scale invasions of the USSR continued until 1935 -- I have found no evidence of large-scale battle-deaths. Therefore I code the war as beginning on March 29, 1929 and ending in December 1931 (the years given by Beckett 1988), and term it the Basmachi Revolt.

**Philippines (vs. Huks)** - This revolt lasted longer than indicated by COW, which codes the termination date as being in 1952. Other sources estimate 9695 or 9095 Huk rebels killed from 1948-1954 (Clodfelter 1991; Beckett 1999) and 1578 government soldiers killed in the same period (Clodfelter 1991). Though the war did not get underway in earnest until the start of a major government military offensive in 1951 (Wood 1968), it does appear from these sources that it did not fall below the COW civil war threshold until 1954, so I use this year as the termination date.
Yemeni (1948) – The COW data codes the rebels as being the Yahya family. In actuality, the Yahya family controlled the government prior to and upon the outbreak of this civil war. The individual who COW codes as the government was al-Wazir, who assassinated Yahya and then raised a revolt among the bulk of the Sanaa garrison; al-Wazir had been stripped of all government positions prior to February 17, 1948, the COW beginning date for this war. Though al-Wazir appointed a Prime Minister on February 20, this was after the beginning of the war; moreover, this appointment and the al-Wazir government were not recognized by foreign powers because of the suspicious circumstances of Yahya’s death. Even within Yemen, al-Wazir’s authority was not recognized by the regular armed forces or militia, and other cities refused to join the revolt (O’Ballance 1971; Bidwell 1983). Given this evidence, it seems more appropriate to code the Yahya family as the government and al-Wazir and the Sanaa garrison as the rebels.

Burma – Burma has experienced continuous civil strife since 1948, with the Burmese government fighting one or more ethnic or regional insurgencies. The coding issue is which periods of conflict resulted in 1000 or more battle-deaths per year. Since there is no evidence to indicate that the communist revolt and army mutiny in 1948 meet the COW threshold, I opt to begin the Burmese civil war with the Karen revolt that began on January 31, 1949, the day after the Karen’s main military arm was outlawed by the government. It is clear that the following years meet this criterion: 1949-1951 (the original COW dates for this war were 1948-1951), November 1958-1960 (at least 2000 battle-deaths; Lintner 1994; Tinker 1961), and 1984 (2436 battle-deaths; Clodfelter
1991). In the absence of further information, I accept the COW coding for the end of the first war, create a new war to account for the years 1958-1960, and combine the 1968-1980 and 1983-1995 wars.

*Indonesia (Darul Islam)* – While COW records the dates for this war as September 20–November 23, 1953, large-scale combat continued for some time. The Javanese rebel forces reached their peak strength only in 1957, and suffered about 1000 battle-deaths each year from 1948-1962 (Jackson 1980). The government itself suffered about 25,000 deaths on Java during this period though this figure does include civilians holding government positions as well as soldiers (Jackson). The Javanese rebels finally ceased fighting when a formal surrender was arranged on June 4, 1962. Other sources confirm this information, including the detailed region-by-region analysis of the revolt in Van Dijk (1981), which also tracks the regional rebellions in Celebes (South Sulawesi) and Aceh as well as a smaller one in Borneo. It appears that although major upswings in violence occurred in the 1951-1953 and 1957-1960 periods, fighting also occurred more or less continuously in between these periods. Van Dijk records “hundreds” of rebel battle-deaths in the Celebes insurgency in September 1955. Given the descriptions of continuous rebellion from 1953 to 1962 and the fact that battle-deaths over this period averaged well over 4000 per year (this figure not including deaths from disease), I conclude that it is likely that each individual year of the revolt was characterized by at least 1000 battle-connected fatalities. The fact that the 1956-1960 period is coded as a civil war by COW (with leftists, rather than Darul Islam forces, listed as rebels) adds further weight to the notion of one long continuous civil war. Therefore, I combine these
wars and code the ending date of the Indonesian civil war beginning in 1953 as June 4, 1962.

*First Kurdish* - COW codes this war as beginning on September 16, 1961 and terminating on November 27, 1963. O’Ballance (1996) records a Kurdish attack on an Iraqi military column several days earlier than the COW start date, on September 11. I use this as the start date for this war. There appears to be nothing special about November 27, 1963. Though this was nine days after the Ba’ath coup and coincided with statements that the government would seek a negotiated solution to the war, sustained combat continued into December 1963 though little serious fighting occurred for the rest of the winter (O’Ballance 1996). Since a cease-fire was signed on February 12, 1964 that held until sometime in February 1965, I use this as the termination date for the war.

*Algeria* – This post-independence civil war among former rebel leaders was fought between forces led by Ben Kheda and those led by Ben Bella. While COW codes the government side as being that of Ben Bella (the winner of the war), it was Ben Kheda who began the war as President, initially controlled the capital, and signed the independence treaty with France that designated the Ben Kheda regime as provisional government (Horne 1978: Humbaraci 1964: Stone 1997: Ottaway and Ottaway 1970). Bueno de Mesquita and Siverson’s leadership dataset and the World Rulers dataset both record Ben Bella as President beginning September 26, 1962 (the COW beginning date for the war is July 28, 1962), but the latter records Ben Kheda as Prime Minister from 1961 until his replacement in 1962 by Ben Bella and the office of President (Bueno de Mesquita and Siverson do not record a leader for Algeria prior to September 26, 1962).
O’Ballance (1967) indicates that the French handed over power to the Provisional Government of Ben Kheda on July 3, 1962 and that the government was recognized that same day by the United States, United Kingdom, USSR, People’s Republic of China, and others, though it was not admitted to the United Nations until October 2 of that year. In short, whether one designates government by formal office, effective control of the capital and governing organs, or international recognition, Ben Kheda better fits those criteria than Ben Bella at the beginning of this civil war. Therefore I code the rebels as being Ben Bella’s forces.

Second Laotian – COW gives a start date of April 19, 1963 for this civil war but Clodfelter (1995) reports that “heavy fighting” resumed in March. I use this earlier estimate for the start date of the conflict.

First Frolinat Rebellion – Although COW codes a beginning date in 1966, Turner (1998) provides evidence of a battle in October 1965 in which the rebels lost 500 troops, and therefore I use October 1965 as the start date of this war.

Cultural Revolution – While it is clear that large-scale armed conflict characterized this period, it is less clear that the majority of that conflict was between government forces and rebels. For some time, the violence was mainly that of different Red Guard factions competing for influence. Mao mobilized Red Guards to attempt to retain power and combat “revisionism.” while his “conservative” opponents within the Chinese government responded by mobilizing their own Red Guard factions, sometimes referred to as “Scarlet Guards” (Harding 1997). It is not clear which faction represented the Chinese government at the time – Mao and Bao Lin ordered the army to intervene on
behalf of the Red Guards on January 23, 1967 (one week after the COW-coded war
beginning) but his orders were widely disobeyed and fighting soon broke out between
army and Red Guard units (An 1972: Harding 1997). On April 6, 1967, the army was
ordered to refrain from attacks on the Red Guards. Fighting raged between Red Guard
factions, and on September 5, 1967 Mao ordered the army to disarm the Red Guards and
fight them if they resisted disarmament: this directive resolved intra-army conflict over
which side to favor (Kuriyama 1979). Even after this order, however, most fighting
occurred between Red Guard units – 50,000 were killed in such combat from April to
July 1968 (An 1972). An notes that on August 1, 1968 the army was given clear orders
to suppress such fighting. Because Sarkees differentiates civil wars, which “involve the
armed forces of the state against those of a domestic opposition” from “intercommunal
wars, which are between two non-state entities.” and because my theoretical focus is on a
central government vs. anti-government rebels, I focus on the combat that occurred
between units of the Chinese army and Mao’s faction of Red Guards. Since the earliest
clear directive to the armed forces of China to combat the Red Guards was given on
September 5, 1967, this is the date I use for the beginning of this civil war. I retain the
COW termination date for this war.

Black September – COW codes the beginning of this civil war as September 17, 1970.
but O’Ballance (1974) indicates that 105 rebels were killed from 13-15 September. I
therefore move the start date of this war back four days to the 13th.

Thailand – Though COW lists this war as beginning in January 1970. Clodfelter
(1995) says the government suffered 300 battle-deaths in 1969, with rebels also suffering
high casualties. Given this fact and the fact that total battle-deaths still average over 1000 per year if the start date is 1969 instead of January 1970. I use the earlier date as the start date for this war. In addition, while COW simply uses October 1973 as the termination date. Clodfelter gives the more precise date of October 10, 1973, the day that both sides signed a cease-fire and began negotiating a coalition government. I use the more precise date.

Second Cambodian – Although COW lists December 25, 1978 as the beginning of this civil war, this date is premature. On that day, the Vietnamese armed forces attacked Cambodia. The government of Cambodia did not flee until January 5, 1979 and the puppet regime (coded as the government in this COW civil war) set up by the Vietnamese was not formed until January 8 (Clodfelter 1995). I therefore use the date January 8, 1979 as the beginning of this civil war.

Iran (Islamic Revolution) – COW codes the beginning of this war as September 3, 1978 and ending December 31, 1979, with the rebels as “Anti-Shah Coalition.” The initial phase of this war involved assassinations and pinprick attacks on government troops, followed by government massacres of civilian demonstrators. Since between 140 and 200 government soldiers, police, or pro-government paramilitaries were killed from September 3 to the end of 1978. I retain the COW coding even though no organized rebel units existed as such until late December when rebels began seizing arms from military caches (Parsa 1989). The most severe combat occurred between February 9 and February 12 1979, which saw the mass defection of military personnel, a declaration of neutrality by the armed forces, and a last-ditch stand by members of the Imperial Guard (Amuzegar
1991: Parsa 1989; Stempel 1981; Hiro 1985). On February 12, the Iranian government was overthrown by the coalition of anti-shah rebels. I code this as the end of the anti-shah civil war. It does appear that over one thousand died in armed confrontations during this five-month period (Hiro 1985).

Almost immediately after the formation of a new pro-Khomeini government, the left-wing Fedayeen rebelled against the fundamentalist mujahideen government on February 14, 1979 (Stempel 1981). Because the government was now composed of former rebels, I code this as the beginning of a new civil war. The government set about rebuilding the armed forces and creating the Revolutionary Guards and within a few days, it was clear that the new civil war pitted the Islamic government and loyal mujahideen (about one-third of them), the new Revolutionary Guards, and the remaining armed forces against the Fedayeen and left-leaning mujahideen (Stempel 1981). When Iran’s Kurds revolted in March 1979, the Fedayeen supported their rebellion and major fighting between the government and the Fedayeen/left-leaning mujahideen/Kurdish forces continued through the end of the year, resulting in thousands of government battle-deaths (Parsa 1989; Stempel 1981; Hiro 1985). Heavy combat continued until at least August 1980 (Hiro 1985), and in February 1981 there was a battle involving 5000 mujahideen against the government (Bakhash 1984). Since this violence continued throughout 1981, I simply combine this war and the 1981-1982 Iran civil war in the COW dataset. This means that instead of two civil wars with the dates September 3, 1978 – December 31, 1979 and June 6, 1981 – May 3, 1982, I code two civil wars with the dates September 3, 1978 – February 12, 1979 and February 14, 1979 – May 3, 1982.
Uganda – The rebels overthrew the government and gained control of the capital on January 26, 1986. By March 19, 1986 control over the entire country had been achieved (Turner 1998). The subsequent Holy Spirit Movement revolt did not occur until late in 1986, and in any event was led by a different group than the former government army, or UNLA, according to Turner. Therefore, I code this war as ending on March 19, 1986.

Somalia – COW codes the termination date for this war as December 22, 1997, but I use the fall of Siad Barre on January 27, 1991 as the termination date for this war. While fighting continued on November 17, 1991, the fighting after that date pitted the self-proclaimed government of Ali Mahdi, one of several rebel leaders, against all the other former rebel groups and even a small clan-based group headed by Barre himself until his death in May 1992 (Adam 1999). Somalia lacked an internationally recognized government after Barre’s fall and while it is still a member of the United Nations, its seat in the organization remains unfilled, and most countries refuse Somali passports (Adam 1999). Therefore, I do not code the subsequent warfare as a new civil war; it seems a much better fit for the COW definition of an intercommunal war (Sarkees 2000).

Romania – COW codes this as a two-day civil war, December 21 and 22, 1991. Although the bulk of the army switched sides on December 22, substantial combat against Ceaucescu loyalists (largely composed of the Securitate, the former secret police) continued until December 26 (Laffin 1990). I therefore code this war as ending on the 26th.
Georgia and Nagorno-Karabach—The COW System Membership dataset codes Georgia and Azerbaijan as becoming independent on December 26, one day after the COW start dates for these civil wars. For consistency, I move the start dates to the 26th.

First Chechnya—COW codes this conflict as ending on April 30, 1996. However, in the battles for Grozny in August of that year, it appears that well over 1000 battle-deaths were sustained. Official Russian figures for the period of August 3 – August 11 put government battle-deaths at 400 (probably an underestimate) while the rebel claim was 2000 (probably an overestimate). Regardless of the exact number, authors agree that Grozny was a serious and costly battle (Smith 1998; Lieven 1998; Knezys and Sedlickas 1999). Therefore, I code the termination date for this war as August 31, when the Khasavyurt Peace Accords ended large-scale fighting and made a cease-fire possible.
Chapter 5

STATISTICS OF PEACE: HYPOTHESIS-TESTING

5.1 THE NATURE OF CIVIL WARS

From a normative standpoint, the most interesting dimension of civil war outcomes predicted by the CWTG is probably the degree to which they end in compromise rather than victory by one side.\(^3\) This study joins others in finding negotiated compromise to be an uncommon outcome of civil wars. If compromise means sharing some of the authority to allocate resources, it occurs less than 16\% of the time, as Table 5.1 illustrates. Collapsing the top three categories, one finds that more than 4.5\% -- about 82\% -- of civil wars have a clearly identifiable victor.

Nevertheless, it would not be accurate to characterize civil wars as savage and total wars without qualification, for many of them do end with formal agreements providing for power sharing, other concessions, or at least amnesty for the defeated. Though the majority of civil wars end with decisive victory for one side, this does not always mean the massacre of the defeated. Moreover, promises of amnesty are usually kept. Nor is it the case that civil wars are interminable struggles -- few civil wars end in stalemate. suggesting that civil wars are not often followed by long-term low-level insurgencies.

Indeed, the average duration of a civil war is just over three years -- a longer period than

\(^3\) Normatively interesting does not necessarily mean normatively desirable. One can certainly imagine wars in which victory by one side may have been more desirable than a compromise. Power-sharing with the Rwandan genocidaires or Pol Pot is difficult to recommend. and the American Civil War did have the effect of ending slavery. Licklider
for interstate wars, but far short of the decades-long conflicts that come to mind when one thinks of low-level internal violence. In general, governments tend to win civil wars: they prevail in over half of them while the rebels prevail about one quarter of the time.\textsuperscript{84} The remaining wars are stalemates or genuine compromises which have no victors.

Table 5.1 Civil War Outcomes, 1816-1997

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Number of Wars</th>
<th>Percentage of All Wars</th>
<th>Percentage Ending With Formal Agreement</th>
<th>Percentage Followed By Massacre</th>
<th>Average Duration in Years</th>
<th>Percentage Won By Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Defeat</td>
<td>101</td>
<td>51.27</td>
<td>7.92</td>
<td>57.43</td>
<td>2.27</td>
<td>66.34</td>
</tr>
<tr>
<td>Surrender With Amnesty</td>
<td>22</td>
<td>11.17</td>
<td>45.45</td>
<td>9.09</td>
<td>2.17</td>
<td>72.73</td>
</tr>
<tr>
<td>Cosmetic Concessions</td>
<td>38</td>
<td>19.29</td>
<td>65.79</td>
<td>5.26</td>
<td>3.43</td>
<td>71.05</td>
</tr>
<tr>
<td>Genuine Compromise</td>
<td>31</td>
<td>15.74</td>
<td>90.32\textsuperscript{85}</td>
<td>3.23\textsuperscript{86}</td>
<td>5.19</td>
<td>N/A</td>
</tr>
<tr>
<td>Stalemate</td>
<td>5</td>
<td>2.54</td>
<td>20.00\textsuperscript{87}</td>
<td>0.00</td>
<td>5.57</td>
<td>N/A</td>
</tr>
</tbody>
</table>

(1995) found compromise in some types of civil war to hold a greater risk of war recurrence than military victories.
\textsuperscript{84} This tendency has been much less pronounced recently – while governments won about 65% of civil wars from 1816 to 1949, they won 54% of wars between 1950 and 1974 and only 37% of wars terminated since then.
\textsuperscript{85} Although I assume that every genuine compromise was the product of agreement between the sides, I was able to identify such an agreement in only 90.32% of compromise outcomes.
\textsuperscript{86} The 1990-1993 Rwandan civil war was ended for more than 12 months by the Arusha Accords, which provided for power sharing between Tutsi rebels and the Hutu government. However, the government conducted executions followed eventually by full-scale genocide against Tutsi within Rwanda. While these Tutsi were geographically distinct from the exile Tutsi who formed the rebel army (who, after all, could defend themselves), it is clear that the massacre was intended to destroy supporters of the rebels and probably did extend to a substantial number of former rebels.
While the CWTG assigns the government a bargaining advantage represented by its proposal power, there are other reasons for the tendency for governments to win civil wars. Figure 5.1 illustrates the balance of military forces as represented by the number of troops on each side, while Figure 5.2 illustrates the proportion of total battle-deaths suffered by governments. Governments usually have more troops than their opponents and also tend to suffer fewer battle-deaths. Since governments usually have most of the state's armed forces at their disposal, this is not particularly surprising. Interestingly, a government victory is more likely to be followed by a massacre of the losers than is a rebel victory, though the difference is less than overwhelming (42% to 31%).

Figure 5.1 Government Troops as Percentage of Total Troops

---

87 The Nagorno-Karabakh rebellion dropped below the level of civil war after a cease-fire was signed, but active combat continued between the Azerbaijani armed forces and Armenian rebels.
At least part of the imbalance in casualties in favor of the government may be due to factors within the war rather than ones preceding it. For this advantage for the government is distributed differently earlier in the war. Figure 5.3 illustrates government battle-deaths as a percentage of total battle-deaths suffered before my estimate of force ratio is taken – that is, in the early to middle stages of civil wars.
Table 5.2 examines battle-deaths in civil wars. Modern civil wars do not necessarily kill more people, though their intensity is relatively high. Indeed civil wars fought since 1950 are more or less average in their absolute lethality, and by far the worst civil war was fought from 1860 to 1877 in China. Nevertheless, modern civil wars have killed an increasingly large proportion of the population within the warring state. The per capita lethality of civil wars since 1950 is nearly double that of previous wars, and modern civil wars last significantly longer.

---

88 The ten deadliest civil wars, in order, were Greek Independence (180,000 battle-deaths), Mexican Caste War/Maya Revolt (200,000), Spanish Civil War (200,000), Afghanistan 1978-1992 (200,000), US Civil War (650,000), Russian Civil War (775,000), Chinese Civil War 1930-1936 (838,000), Vietnam War (985,000), Chinese Civil War 1946-1950 (1,250,000), and Chinese 19th Century Rebellions (2,450,000). The
Table 5.2 Destructiveness of Civil Wars By Onset Year, 1816-1997

<table>
<thead>
<tr>
<th></th>
<th>1816 to 1824</th>
<th>1825 to 1849</th>
<th>1850 to 1874</th>
<th>1875 to 1899</th>
<th>1900 to 1924</th>
<th>1925 to 1949</th>
<th>1950 to 1974</th>
<th>1975 to 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Wars</td>
<td>5</td>
<td>22</td>
<td>28</td>
<td>16</td>
<td>23</td>
<td>21</td>
<td>39</td>
<td>43</td>
</tr>
<tr>
<td>Average Battle-Deaths</td>
<td>39.400</td>
<td>27.346</td>
<td>119.423</td>
<td>12.993</td>
<td>45.233</td>
<td>140.980</td>
<td>51.813</td>
<td>32.902</td>
</tr>
<tr>
<td>Average Battle-Deaths Per 10,000&lt;sup&gt;9&lt;/sup&gt;</td>
<td>1.6</td>
<td>2.5</td>
<td>2.5</td>
<td>2.2</td>
<td>1.3</td>
<td>2.9</td>
<td>4.2</td>
<td>5.0</td>
</tr>
<tr>
<td>Average Intensity&lt;sup&gt;10&lt;/sup&gt;</td>
<td>24</td>
<td>151</td>
<td>93</td>
<td>28</td>
<td>89</td>
<td>143</td>
<td>72</td>
<td>134</td>
</tr>
<tr>
<td>Average Duration in Years</td>
<td>3.1</td>
<td>2.9</td>
<td>1.8&lt;sup&gt;11&lt;/sup&gt;</td>
<td>1.1</td>
<td>1.1</td>
<td>2.7</td>
<td>4.5</td>
<td>4.4&lt;sup&gt;12&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

International involvement in civil wars is relatively frequent. Table 5.3 summarizes the internationalization of civil wars. Intervention appears to be about equally common for each side – intervention for the government occurs in about 27% of wars while intervention for the rebels occurs roughly 25% of the time. In either case, intervention for one side is followed by intervention for its opponent somewhat more than half of the last of these would be even deadlier if battle-deaths prior to China’s entry into the world-system in 1860 were included.

<sup>9</sup> Relative to prewar population.
<sup>10</sup> Average number of battle-deaths per day.
<sup>11</sup> This period includes an unusually large number of beginning-censored wars, which were up to ten years old by the time this dataset records their onset with entry into the world system.
<sup>12</sup> This figure might be higher absent the decision to exclude civil wars not ended by 1997 from this analysis.
time. The number of intervenors on a given side ranges from 1 to 8, with a single exception.\textsuperscript{93}

### Table 5.3 Internationalization of Civil Wars

<table>
<thead>
<tr>
<th></th>
<th>No Pro-Rebel Intervention</th>
<th>Pro-Rebel Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Pro-Government</td>
<td>119 (60.41%)</td>
<td>24 (12.18%)</td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pro-Government</td>
<td>29 (14.72%)</td>
<td>25 (12.69%)</td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percentages indicate cell frequencies.

Such intervention is not a new phenomenon, but it has become more frequent since the Second World War. Table 5.4 illustrates changes in the frequency of military intervention in civil wars over time. Not only has the frequency of intervention increased since 1949, but the number of intervenors that get involved has also increased. The average recent civil war characterized by intervention involves the armed forces of four different external actors, though the average intervening force is only moderately greater than the historical average.

\textsuperscript{93} The Russian Civil War was characterized by intervention on behalf of the rebels by the Czech Legion in Siberia and at least 17 independent states: the United States, Britain, France, Germany, Italy, Japan, Canada, Finland, Rumania, Poland, Turkey, Estonia, Afghanistan, Lithuania, Latvia, Serbia, and Greece (Mawdsley 1987; White 1994; Luckett 1971; Clodfelter 1991; O’Ballance 1993; Arens and Ezergailis 1997; Schmid 1985).
Table 5.4 Frequency of Intervention By Onset Year, 1816-1997

<table>
<thead>
<tr>
<th></th>
<th>1816 to 1824</th>
<th>1825 to 1849</th>
<th>1850 to 1874</th>
<th>1875 to 1899</th>
<th>1900 to 1924</th>
<th>1925 to 1949</th>
<th>1950 to 1974</th>
<th>1975 to 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Wars</td>
<td>5</td>
<td>22</td>
<td>28</td>
<td>16</td>
<td>23</td>
<td>21</td>
<td>39</td>
<td>43</td>
</tr>
<tr>
<td>Interv. Freq.</td>
<td>80.00%</td>
<td>36.36%</td>
<td>25.00%</td>
<td>31.25%</td>
<td>34.78%</td>
<td>23.81%</td>
<td>48.72%</td>
<td>51.16%</td>
</tr>
<tr>
<td>Average Number</td>
<td>1.75</td>
<td>1.50</td>
<td>1.14</td>
<td>2.80</td>
<td>3.63</td>
<td>2.20</td>
<td>2.68</td>
<td>3.95</td>
</tr>
<tr>
<td>Actors Per Interv.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Number</td>
<td>54.745</td>
<td>36.674</td>
<td>29.193</td>
<td>14.447</td>
<td>16.217</td>
<td>51.587</td>
<td>20.656</td>
<td>47.914</td>
</tr>
<tr>
<td>Troops Per Interv. Per Actor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Most intervention does not substantially alter the balance between the government and the rebels. Figure 5.4 illustrates the change between the pre-intervention and post-intervention force ratios for all wars characterized by intervention.

Figure 5.4 Post Intervention Force Ratio - Pre Intervention Force Ratio
5.2 PREDICTING COMPROMISE

Given its prominence in the civil war termination literature, its substantive importance as a political phenomenon, and its normative importance, the question of whether civil wars end in compromise should be approached from several different angles. This analysis attempts to both evaluate the hypotheses outlined in Chapter 3 and to extend knowledge on the relationship between internationalization of civil wars and their outcome.

By and large, I have omitted description of statistical models that integrate multiple theoretical variables because almost all combinations of variables generate nonlinear hypotheses. For example, while a higher force ratio and increased costs of war are each supposed to increase the probability of compromise, a logit model of the predicted values generated by the CWTG found that the relationship disappeared when both were used in a single function, despite the fact that the force ratio and cost parameters were drawn completely independently of one another. As force ratio changes, so does the predicted direction, magnitude, and even degree of monotonicity of the predicted relationship between costs and compromise. As it seems prudent to examine the simplest relationships first, I focus on the bivariate hypotheses generated by the model rather than the more complex interactions between variables that it implies.
• Hypothesis 1: *Compromise* is more likely if \( \text{force ratio} < .333 \) than if \( \text{force ratio} > .667 \).

Four logit models were examined for each of three different measures of the force ratio. The logit models vary by whether they employ analytical weights and whether they correct for the fact that compromise is relatively rare in civil wars. Under the first of these conditions, each observation is weighted by the estimated reliability of the force ratio estimate for that particular civil war. As noted in Chapter 4, the estimated reliability of the force ratio is determined by the temporal distance between the measures of government and rebel strength, the extent to which those measures are the product of research rather than an author's educated guess, the stability of the estimate over time, and whether averaging or interpolation was required to construct the estimate. In the case of force ratio including intervenors' troops, the reliability variable also takes into account the temporal distance between the estimates of the local force ratio and military intervention. The second adjustment to the standard logit model makes use of the Relogit software to re-estimate standard errors and coefficients when one outcome of the dependent variable is much less common than another (Tomz, King and Zeng, 1999).  

I constructed a variable called Extreme Government Advantage from the force ratio. It takes the value 0 if Force Ratio < .333, 1 if Force Ratio > .667, and missing otherwise. Table 5.5 presents the estimated effect of moving from a force ratio of 2:1 in favor of the
rebels to 2:1 in favor of the government, excluding cases where the force ratio fell
between these levels.

Table 5.5 Genuine Compromise Given Extreme Government Advantage (Force
Ratio <.333 or Force Ratio >.667)

| Statistical Model       | Extreme Govt Advantage | Std Error | Z Score | P>|z| | Const. | Chi2 | P > Chi2 | Pseud R2 |
|-------------------------|------------------------|-----------|---------|------|--------|------|---------|----------|
| Logit                   | -.703                  | .632      | -1.113  | .266 | -1.179 | 1.13 | .287    | .010     |
| Logit. Rare             | -.763                  | .625      | -1.221  | .222 | -1.092 |      |         |          |
| Logit. Weights          | -.703                  | .595      | -1.181  | .238 | -1.099 | 1.29 | .256    | .011     |
| Logit. Rare. Weights    | -.717                  | .645      | -1.111  | .267 | -1.077 |      |         |          |

<table>
<thead>
<tr>
<th>Extreme Govt Advantage Pre-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logit</td>
</tr>
<tr>
<td>Logit. Rare</td>
</tr>
<tr>
<td>Logit. Weights</td>
</tr>
<tr>
<td>Logit. Rare. Weights</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extreme Govt Advantage Including Interveners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logit</td>
</tr>
<tr>
<td>Logit. Rare</td>
</tr>
<tr>
<td>Logit. Weights</td>
</tr>
<tr>
<td>Logit. Rare. Weights</td>
</tr>
</tbody>
</table>

N= 138: Reported p values use two-tailed tests. Dependent variable is Genuine Compromise.

While the coefficient of Extreme Government Advantage is always negative,
indicating that compromise was less likely if the government held a 2:1 advantage than if

\*\*\ A full description of the procedures underlying this re-estimation technique may be
the rebels did, it is never significant, even when using a one-tailed t-test to account for the hypothesized direction of effect. Virtually identical results were used even after weighting observations by the estimated reliability of the force ratio measure, correcting estimated parameters for the fact that compromise is somewhat rare, and combining the two. Substituting the second estimate of Force Ratio (estimated before the first military intervention occurs) slightly weakens the significance but otherwise changes little. Further analysis will continue to use analytical weighting by coded reliability of force ratio estimate in a standard logit analysis. Where the weighting and/or rare events corrections change the results of analysis in any substantive way, I report those differences. Not shown are the results of logit analyses of Mutual Concessions given Extreme Government Advantage, which were not substantively different from those for Genuine Compromise.

Turning to an ordinal measure of negotiation, Table 5.6 outlines the results of an ordered probit analysis of the degree to which a war is ended by negotiation: estimated changes in probability were computed using the software Clarify (Tomz, Wittenberg, and King 1999). As noted in Chapter 4, the degree of negotiation is measured by first taking the Outcome of a war from unconditional surrender to genuine compromise, then subtracting one if a postwar massacre occurred and adding one if a formal agreement was

---

found in King and Zeng (1999a, 1999b).

95 Clarify provides quantities of interest, such as estimated probabilities and standard errors of those estimates by simulating draws of these quantities from a multivariate normal distribution. A complete description of this procedure and the implementation of it may be found in King, Tomz, and Wittenberg (1998).
reached. Therefore, lower values reflect military outcomes and higher values reflect negotiated outcomes.

The coefficient of Extreme Government Advantage is negative, indicating that when Force Ratio > .667, the probability a war ends in a less "negotiated" manner increases. The highest levels of negotiation, involving genuine compromises concluded by formal agreement, are much less likely if the government holds a 2:1 advantage than if the rebels hold a 2:1 advantage. The lowest levels of the scale, in which military victory is followed by massacres, are more likely if the government has the extreme advantage, allowing rejection of the null hypothesis. Note that the predicted effect of Extreme Government Advantage is strongest at the margins – moving from a dramatic advantage for the rebels to one for the government makes a war that was already likely to end without negotiation much more likely to end in unconditional surrender and or massacre, but has little effect on a war that was likely to end in a mutually-honored formal agreement for surrender with amnesty provisions. This is probably an artifact of the use of a dichotomous independent variable to predict movement across five categories – any change in Extreme Government Advantage is an enormous change in Force Ratio.

This relationship becomes weaker and insignificant when troops contributed by intervenors are included in the analysis, which is surprising considering that the resulting force ratio estimate is probably a more accurate representation of the actual number of
troops on the ground. Moreover, only the in the pre-intervention analysis is the overall model statistically significant using a Chi2 test.

### Table 5.6 Degree of Negotiation And Extreme Government Advantage: Ordered Probit Analysis

<table>
<thead>
<tr>
<th></th>
<th>Extreme Government Advantage</th>
<th>Extreme Government Advantage Pre-Intervention</th>
<th>Extreme Government Advantage Including Intervenors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>138</td>
<td>143</td>
<td>140</td>
</tr>
<tr>
<td>Chi2</td>
<td>2.52</td>
<td>6.96</td>
<td>.78</td>
</tr>
<tr>
<td>Prob &gt; chi2</td>
<td>.112</td>
<td>.008</td>
<td>.376</td>
</tr>
<tr>
<td>Pseudo R2</td>
<td>.005</td>
<td>.014</td>
<td>.002</td>
</tr>
<tr>
<td>Coefficient</td>
<td>- .436</td>
<td>-.799</td>
<td>-.249</td>
</tr>
<tr>
<td>Standard Error</td>
<td>.274</td>
<td>.304</td>
<td>.282</td>
</tr>
<tr>
<td>Z</td>
<td>-1.588</td>
<td>-2.627</td>
<td>- .885</td>
</tr>
<tr>
<td>Prob &gt;</td>
<td>z</td>
<td></td>
<td>.112</td>
</tr>
<tr>
<td>Change in P(Degree of Negotiation = 0)</td>
<td>--------</td>
<td>.202</td>
<td>.078</td>
</tr>
<tr>
<td>Change in P(Degree of Negotiation = 1)</td>
<td>.137</td>
<td>.091</td>
<td>.018</td>
</tr>
<tr>
<td>Change in P(Degree of Negotiation = 2)</td>
<td>.033</td>
<td>.013</td>
<td>-.000</td>
</tr>
<tr>
<td>Change in P(Degree of Negotiation = 3)</td>
<td>.003</td>
<td>-.008</td>
<td>-.008</td>
</tr>
<tr>
<td>Change in P(Degree of Negotiation = 4)</td>
<td>-.012</td>
<td>-.073</td>
<td>-.024</td>
</tr>
<tr>
<td>Change in P(Degree of Negotiation = 5)</td>
<td>-.122</td>
<td>-.225</td>
<td>-.064</td>
</tr>
</tbody>
</table>

Reported significance statistics use two-tailed tests, asterisks indicate one-tailed t-tests:

* p<.05. ** p<.01. *** p<.001  Dependent variable is Degree of Negotiation.

---

96 While it might be argued that levels of significance are irrelevant when an entire population of cases is being examined, the need to make predictions means that findings should be generalizable to future civil wars as well. Civil wars fought between 1816 and 1997, then, are only a sample of all civil wars of interest.
One difficulty with evaluating this hypothesis and the anomalous results for cases of intervention in greater detail is that there are only 17 cases in which Force Ratio < .334 but 121 cases in which Force Ratio > .666: that is, the government has at least a 2:1 advantage in over half of civil wars.\footnote{These figures are 16 and 122, respectively, when using the pre-intervention estimates of Force Ratio or the pre-intervention estimates corrected for intervenor strength.} Table 5.7 illustrates this disparity, using the initial estimate of Force Ratio for each side.

**Table 5.7 Genuine Compromise and Extreme Military Advantage**

<table>
<thead>
<tr>
<th>Genuine Compromise?</th>
<th>\textit{Extreme Military Advantage (2:1 Superiority) For Which Side?}</th>
<th>\</th>
<th>\</th>
<th>Rebels (Force Ratio &lt; .334)</th>
<th>Government (Force Ratio &gt; .666)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td></td>
<td>13</td>
<td>105</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>4</td>
<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The theory is suggestive of a more general relationship between force ratio and compromise: as noted in Chapter 3 (see Figure 3.1), if we assume that each model of expected change in the force ratio is as likely to exist in a civil war as any other, a general, monotonic relationship between force ratio and compromise should exist. That is, simply averaging the expected Force Ratio-Compromise relationship under each of the five combat models would generate a monotonic relationship, allowing all wars in which...
Force Ratio was known to be used in this analysis. Specifically, as the force ratio increases, the likelihood of compromise should decrease.

What is more, even without assuming anything about the relative probability of each model of expected change in force ratio, simple logit analyses of the outcomes generated by the CWTG given changes in force ratio reveals that a logit test should produce the result that force ratio decreases the likelihood of compromise. That is, if the \( \text{NEGO}_{CC} \) equilibrium is used as the dependent variable in a logit analysis with the randomly drawn Force Ratio \( (q_{ij}) \) as the independent variable, the coefficient of Force Ratio is significant and negative. This occurs because the non-monotonicity in the force ratio-compromise relationship is relatively small compared to the overall negative trend.

In an attempt to further probe the relationship between the military balance and negotiation, I examine the general relationship between Force Ratio and Genuine Compromise. Table 5.8 presents an initial analysis of the effects of Force Ratio on Genuine Compromise, accounting for the possible effect of military intervention on the force ratio.\(^{98}\) The results generally support the notion that as the government's relative military superiority increases, genuine compromise becomes less likely—regardless of the estimate of Force Ratio used, its coefficient remains significant and negative, indicating that government strength reduces compromise.

\(^{98}\) In order to enhance presentation and to denote those variables for which single-tailed tests of significance are appropriate, variables in this and subsequent charts are printed in boldface type if there is a clear theoretical prediction of their effects. This separates the substantive variables from control variables and constant terms.
Table 5.8 Logit Analyses of Genuine Compromise and Force Ratio (Weighted)

| Variable                              | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|---------------------------------------|-------------|----------------|---------|-------|--------------------------|
| Force Ratio                           | -2.269      | .817           | -2.772  | .006**| -3.874 - .665            |
| Constant                              | -.138       | .544           | -2.54   | .799  | -1.205 .928             |
|                                       | Chi² 7.69   | Prob. .005     | Pseudo R² .044 |
| Force Ratio                           | -1.928      | .797           | -2.419  | .016**| -3.490 - .366            |
| Pre-Intervention                      |             |                |         |       |                          |
| Constant                              | -.315       | .552           | -.570   | .568  | -1.398 .768             |
|                                       | Chi² 6.76   | Prob. .16      | Pseudo R² .055 |
| Force Ratio                           | -1.557      | .791           | -1.969  | .049  | -3.108 .007             |
| (Including Intervenors)               |             |                |         |       |                          |
| Constant                              | -.601       | .545           | -1.103  | .270  | -1.670 .467             |
|                                       | Chi² 8.60   | Prob. .082     | Pseudo R² .022 |

N = 195 Reported significance statistics use two-tailed tests. asterisks indicate one-tailed t-tests:
* p<.05. ** p<.01. *** p<.001 Dependent variable is Genuine Compromise.

Before examining the differences in these results, it is useful to gain a baseline view of the relationship described by the logit function. Figure 5.5 illustrates the logit function's estimate of the probability of compromise given changes in the force ratio, as well as the 95% confidence interval surrounding this estimate. To generate this figure, Clarify was used to simulate draws of the coefficient of Force Ratio. The results illustrate the weakest of the predicted Force Ratio-Compromise relationships, and highlight the fact that while it seems likely that increasing the Force Ratio from .5 to .9 decreases the probability of Compromise, the effect of moving from .1 to .5 is much less clear, given the low number of wars in which the rebels have an advantage. The effect of the initial estimate of Force Ratio is more dramatic, lowering the predicted probability of
Compromise from nearly .5 when Force Ratio is close to zero to less than .1 when it is close to one.

Figure 5.5 Predicted Effect of Force Ratio (Including Interveners) on Compromise, With Simulated 95% Confidence Intervals

Returning to the results in Table 5.8, it is not surprising that the relationship between force ratio and genuine compromise appears to weaken when the strictly pre-intervention measure is used instead of the initial estimate. Estimating the pre-intervention force ratio involves making more assumptions about the data and using interpolation instead of direct estimates in some cases. What is more surprising is that “correcting” the pre-intervention force ratio by including the troop strength of intervenors further weakens the
observed effect, just as in the evaluation of Extreme Government Advantage. This suggests that the effect of military intervention may not be entirely captured by the number of troops the intervenor uses. That is, simply adding in the troops of intervenors and then recomputing the force ratio results in decreased predictive accuracy, suggesting that either error has been added or that intervention exerts an effect on the probability of compromise out of proportion to the number of troops involved. In order to examine this possibility, I add intervention terms to the pre-intervention and including-intervention force ratio estimates. Table 5.9 displays the results.

Table 5.9 Logit Analyses of Genuine Compromise, Force Ratio, and Military Intervention (Weighted)\(^9\)

| Variable                          | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|-----------------------------------|-------------|----------------|---------|-----|------------------------|
| Force Ratio (Pre-Intervention)    | -1.728      | .833           | -2.074  | .038*| -3.361                 | -.095               |
| Military Intervention             | 1.246       | .417           | 2.990   | .003 | .429                   | 2.063               |
| Constant                          | -1.100      | .641           | -1.715  | .086 | -2.357                 | .157                |
|                                   | Chi\(^2\) 15.29 | Prob = Chi\(^2\) 0.005 | Pseudo R\(^2\) 0.088 |
| Force Ratio (With Intervenors)    | -1.042      | .858           | -1.215  | .224 | -2.723                 | .639                |
| Military Intervention             | 1.375       | .415           | 3.311   | .001 | .561                   | 2.189               |
| Constant                          | -1.560      | .665           | -2.343  | .019 | -2.864                 | -.255               |
|                                   | Chi\(^2\) 15.43 | Prob = Chi\(^2\) 0.005 | Pseudo R\(^2\) 0.088 |
| Force Ratio (Pre-Intervention)    | -1.670      | .851           | -1.962  | .050*| -3.339                 | -.002               |
| Intervention for Govt             | 1.189       | .433           | 2.747   | .006 | .340                   | 2.037               |

\(^9\) As there is no theoretically expected direction for any effect of intervention extending beyond the number of troops committed to a side. I do not report one-tailed significance levels for the intervention variables.
| Variable                        | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|--------------------------------|-------------|----------------|---------|------|------------------------|
| Intervention for Rebels        | .513        | .446           | 1.150   | .250 | -.361 - 1.387          |
| Constant                       | -1.126      | .635           | -1.773  | .076 | -.2371 - .119          |
|                                | Chi2        | 18.05          | Prob Chi2 | 0004 | Pseudo R2 104          |
| Force Ratio (With Intervenors) | -1.155      | .896           | -1.288  | .198 | -2.911 - .602          |
| Intervention for Govt          | 1.488       | .455           | 3.270   | .001 | .596 - 2.380           |
| Intervention for Rebels        | .522        | .479           | 1.089   | .276 | -.417 - 1.462          |
| Constant                       | -1.522      | .674           | -2.258  | .024 | -2.844 - .201          |
|                                | Chi2        | 21.01          | Prob Chi2 | 0001 | Pseudo R2 22           |
| Force Ratio (Pre-Intervention) | -1.809      | .859           | -2.105  | .035*| -3.494 - .124          |
| # Intervenors for Govt         | .466        | .122           | 3.818   | .000 | .227 - .706            |
| # Intervenors for Rebels       | .091        | .127           | .716    | .474 | -.158 - .339           |
| Constant                       | -.909       | .607           | -1.498  | .134 | -2.097 - .280          |
|                                | Chi2        | 23.95          | Prob Chi2 | 00010| Pseudo R2 158          |
| Force Ratio (With Intervenors) | -1.726      | .911           | -1.896  | .058*| -3.511 - .059          |
| # Intervenors for Govt         | .591        | .138           | 4.296   | .000 | .322 - .861            |
| # Intervenors for Rebels       | .002        | .134           | .019    | .985 | -.260 - .265           |
| Constant                       | -1.000      | .639           | -1.565  | .118 | -2.251 - .252          |
|                                | Chi2        | 27.21          | Prob Chi2 | 00010| Pseudo R2 158          |

N = 195. Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests.

*p<.05, **p<.01, ***p<.001
The results are intriguing. There does indeed appear to be an effect to military intervention that is not captured by simply measuring the number of troops the intervention adds to each side. Intervention variables remain significant even after controlling for the effects of military intervention on the force ratio. Further analysis shows that the effect appears to be limited to intervention on behalf of the government — while the coefficient of pro-rebel intervention is positive, it is never significant while that of pro-government intervention is always positive and significant, regardless of whether the mere existence of such intervention or the number of actors intervening is examined. Perhaps the most surprising result in Table 5.9 is the sign of the coefficient on intervention for the government, because if compromise becomes less likely as the government’s relative power increases, one might logically expect intervention on behalf of the government to make it less likely still. Nevertheless, the effect is consistently positive. Figure 5.6 illustrates the predicted statistical effect of intervention on behalf of the government. Pro-government intervention does not eliminate the effects of the Force Ratio on the probability of Compromise, but it independently increases that probability, all else being equal. For clarity, confidence intervals have been omitted, but it is important to remember that the range of error in these predictions is generally quite large.
Lending further credence to the notion that something about the fact of intervention and not the number of troops used is affecting the likelihood of compromise are the results of the last two analyses in Table 5.9. Even after accounting for the strictly military contributions of the intervention to the force ratio, the number of intervenors on behalf of the government is an important determinant of whether the sides reach a genuine compromise. Given that the international legitimacy of the government is one of the reasons for the government's proposal power in the CWTG, it is possible that the number of actors actively assisting the government is in some manner capturing the degree of international support for its continued existence. This does not explain why the
existence of intervention or number of intervenors on the rebel side do not appear to be significant predictors of whether compromise is reached.

Perhaps the effect is created by an interaction of government and rebel interventions: if one intervention draws in others on the opposing side, we might expect that one coefficient would be highly significant while the other would not.\textsuperscript{100} One way to examine this possibility is to test whether the effect of intervention for the government remains when controlling for cases in which intervention occurred for both sides.\textsuperscript{101} Table 5.10 displays the results of such an analysis.

The results of Table 5.10 are puzzling, for it does not appear that the absence of apparent effect for intervention on behalf of the rebels is due to the confluence of intervention on both sides. Instead, the observed effect of intervention for the rebels remains insignificant (both statistically and substantively) while the effect of government intervention remains significant in the first model.\textsuperscript{102} However, the estimate of Force Ratio including intervenors is not significant, having a p value of .095 in a one-tailed test. Importantly, the effect of pro-government intervention on the estimated probability of genuine compromise appears to be increased if another intervenor jumps in on the rebel side. While intervention on behalf of the government appears to increase the chances of

\textsuperscript{100} The actual correlation between intervention on behalf of the government and intervention on behalf of the rebels is a relatively modest .3, while the correlation between the number of intervenors on each side is .21.

\textsuperscript{101} These results remain essentially unchanged if one controls for civil wars characterized by intervention from their very beginning.

\textsuperscript{102} If intervention on behalf of the government occurs for different reasons than intervention on behalf of the rebels, and if those different reasons correlate with the outcome of civil wars, then a selection effect may be responsible for this anomaly.
compromise, intervention on both sides in a civil war increases it even more. This effect remains even after controlling for the troop strength of intervenors – indeed, including intervention troop strength actually makes the observed effect of force ratio insignificant by a .05 standard. Again, the results strongly suggest an effect of military intervention that goes beyond the strictly military components of the act.

Table 5.10 Force Ratio, Intervention on Both Sides, Intervention on One Side Only and Genuine Compromise

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Z Score</th>
<th>P &gt; -z</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force Ratio (Pre-Intervention)</td>
<td>-1.166</td>
<td>.854</td>
<td>-1.950</td>
<td>.051</td>
<td>-3.338</td>
</tr>
<tr>
<td>Intervention Govt Only (29 wars)</td>
<td>1.222</td>
<td>.541</td>
<td>2.260</td>
<td>.024</td>
<td>.152</td>
</tr>
<tr>
<td>Intervention Rebels Only (24 wars)</td>
<td>.565</td>
<td>.675</td>
<td>.838</td>
<td>.402</td>
<td>-.755</td>
</tr>
<tr>
<td>Intervention Both Sides (25 wars)</td>
<td>1.696</td>
<td>.517</td>
<td>3.278</td>
<td>.001</td>
<td>.682</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.142</td>
<td>.655</td>
<td>-1.743</td>
<td>.081</td>
<td>-2.426</td>
</tr>
<tr>
<td></td>
<td>Chi²</td>
<td>18.06</td>
<td>Prob</td>
<td>Chi²</td>
<td>Pseudo R²</td>
</tr>
<tr>
<td>Force Ratio (With Intervenors)</td>
<td>-1.174</td>
<td>.897</td>
<td>-1.308</td>
<td>.191</td>
<td>-2.933</td>
</tr>
<tr>
<td>Intervention Govt Only (29 wars)</td>
<td>1.342</td>
<td>.588</td>
<td>2.281</td>
<td>.023</td>
<td>.189</td>
</tr>
<tr>
<td>Intervention Rebels Only (24 wars)</td>
<td>.318</td>
<td>.715</td>
<td>.444</td>
<td>.657</td>
<td>-1.084</td>
</tr>
<tr>
<td>Intervention Both Sides (25 wars)</td>
<td>2.042</td>
<td>.521</td>
<td>3.920</td>
<td>.000</td>
<td>1.021</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.469</td>
<td>.685</td>
<td>-2.144</td>
<td>.032</td>
<td>-2.811</td>
</tr>
<tr>
<td></td>
<td>Chi²</td>
<td>21.17</td>
<td>Prob</td>
<td>Chi²</td>
<td>Pseudo R²</td>
</tr>
</tbody>
</table>

N = 195 Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests:
* p < .05. ** p < .01. *** p < .001

Perhaps rebels only get intervenors on their behalf when they are already likely to win, given the legitimacy of the government and dangers of recognizing the opposition.
The results of these tests are generally supportive of the idea that the force ratio influences the likelihood of a genuine compromise in civil wars – as the government gets stronger, the chances for compromise decrease, while as the rebels get stronger, compromise becomes more likely. Examining only radical changes in force ratio fails to detect this effect, and the observed effects of military intervention generally run contrary to expectations.

Perhaps the most interesting results are those for pro-government intervention, which seems to have a strong effect on the outcome of civil wars not accounted for by the military strength of the intervention force. While in most cases accounting for the troop strength of intervenors improves one's prediction of civil war outcomes, the changes in civil war outcomes associated with the existence of intervention far outweigh this effect. Finally, it appears that the more internationalized a civil war becomes, the better are the chances for its resolution by compromise.

- Hypothesis 2: *Higher rates of prior rebel costs* increase the probability of *compromise*.

Several measures of rebel battle-deaths are examined to determine if compromise becomes more likely as the war becomes more costly for the rebels.\(^{103}\) Table 5.11 presents the results of logit analyses of Genuine Compromise. The results are mixed.

\(^{103}\) Also examined but not reported are per capita casualties. The results are negative coefficients that are not significant.
Using an ordinary logit analysis, the coefficient of the rebel battle-death measures is never significant, and even the overall logit model is rarely significant.

Using the rare-events corrections for logit analyses yields different results – some measures of rebel costs are both significant and positive, as predicted by this hypothesis. Specifically, both the number of rebels killed per day prior to the force ratio estimate and this number as compared to the size of the rebel army are significantly and positively related to the likelihood of compromise. It should be noted that only a small number of wars contain estimates of prior battle-deaths drawn from historical sources. Moreover, it appears that attempting to estimate rebel deaths in those wars for which such information is unavailable has not generated a more useful measurement than limiting the analysis to historical estimates.

While these results lend partial support to Hypothesis 2 by disconfirming the null hypothesis that rebel battle-deaths are unrelated to the likelihood of compromise, it is puzzling that they should be so mixed. Before examining the results for rebel battle-deaths in greater detail, I turn to the next hypothesis, which involves government costs.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>Z Score</th>
<th>P&gt;z</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rebel Battle-Deaths (10,000s)</td>
<td>-.088</td>
<td>.054</td>
<td>-.596</td>
<td>.551</td>
<td>-.376 -.201</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.032</td>
<td>.380</td>
<td>-5.343</td>
<td>.000</td>
<td>-2.778 -1.287</td>
</tr>
<tr>
<td>N = 90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob Chi2</td>
<td>.341</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo R2</td>
<td>.014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Coefficients</td>
<td>Standard Error</td>
<td>Z Score</td>
<td>P &gt;</td>
<td>95% Confidence Interval</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>--------------</td>
<td>----------------</td>
<td>---------</td>
<td>-----</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Prior Rebel Battle-Deaths (10,000s)</td>
<td>-2.010</td>
<td>2.064</td>
<td>-0.974</td>
<td>.330</td>
<td>-6.056 - 2.036</td>
</tr>
<tr>
<td></td>
<td>-0.989</td>
<td>1.562</td>
<td>-0.633</td>
<td>.527</td>
<td>-4.050 - 2.073</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.716</td>
<td>0.484</td>
<td>-1.476</td>
<td>.140</td>
<td>-1.666 - 0.235</td>
</tr>
<tr>
<td></td>
<td>-0.767</td>
<td>0.445</td>
<td>-1.722</td>
<td>.085</td>
<td>-1.640 - 0.106</td>
</tr>
<tr>
<td>N = 38</td>
<td>Chi2 3.05</td>
<td>Prob = Chi2 .081</td>
<td>Pseudo R2 .25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior Rebel Battle-Deaths (Estimated, 10,000s)</td>
<td>-0.099</td>
<td>0.129</td>
<td>-0.766</td>
<td>.444</td>
<td>-0.353 - 0.154</td>
</tr>
<tr>
<td></td>
<td>-0.014</td>
<td>0.084</td>
<td>-0.175</td>
<td>.861</td>
<td>-0.179 - 0.150</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.563</td>
<td>0.216</td>
<td>-7.251</td>
<td>.000</td>
<td>-1.985 - 1.140</td>
</tr>
<tr>
<td></td>
<td>-1.592</td>
<td>0.205</td>
<td>-7.773</td>
<td>.000</td>
<td>-1.993 - 1.190</td>
</tr>
<tr>
<td>N = 38</td>
<td>Chi2 4.42</td>
<td>Prob = Chi2 .03</td>
<td>Pseudo R2 .08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior Rebel Battle-Deaths / Day</td>
<td>-0.005</td>
<td>0.010</td>
<td>-0.498</td>
<td>.619</td>
<td>-0.026 - 0.015</td>
</tr>
<tr>
<td></td>
<td>0.024</td>
<td>0.007</td>
<td>3.648</td>
<td>.000***</td>
<td>.011 - 0.037</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.044</td>
<td>0.405</td>
<td>-2.583</td>
<td>.010</td>
<td>-1.838 - 0.252</td>
</tr>
<tr>
<td></td>
<td>-1.289</td>
<td>0.379</td>
<td>-3.400</td>
<td>.001</td>
<td>-2.032 - 0.546</td>
</tr>
<tr>
<td>N = 38</td>
<td>Chi2 1.03</td>
<td>Prob = Chi2 .05</td>
<td>Pseudo R2 .05</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>53.419</td>
<td>21.962</td>
<td>2.432</td>
<td>.015**</td>
<td>10.374 - 96.463</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.119</td>
<td>0.392</td>
<td>-2.856</td>
<td>.004</td>
<td>-1.887 - 0.351</td>
</tr>
<tr>
<td></td>
<td>-1.159</td>
<td>0.373</td>
<td>-3.106</td>
<td>.002</td>
<td>-1.889 - 0.427</td>
</tr>
<tr>
<td>N = 38</td>
<td>Chi2 2.88</td>
<td>Prob = Chi2 .594</td>
<td>Pseudo R2 .01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests:
* p < .05. ** p < .01. *** p < .001

104 Details of this estimate are presented in Chapter 4. Of course, all battle-death figures are actually estimates, but I use the “Estimated” designation to indicate measures of rebel battle-deaths constructed in the absence of any specific historical information on the substantive variable. Also examined were this estimate of prior rebel battle-deaths per day, per day / 10,000 population, and per day / rebel soldier. Coefficients of these terms were negative but not significant under ordinary logit or logit corrected for rare events.

105 Also examined was prior rebel battle-deaths per day / 10,000 population. The coefficient was negative but insignificant.
Hypothesis 3: *Higher rates of prior government costs* increase the probability of *compromise*

I examine the relationship between government battle-deaths and compromise using the same measures as for rebel battle-deaths. Table 5.12 summarizes the results, which are again mixed, and in a different manner than those for rebel battle-deaths. Once again, ordinary logit finds no coefficients are significant and every one of them is negative rather than positive. Expansive Compromise does not appear to be affected by government battle-deaths either.

However, correcting for rare events data reveals two positive, significant coefficients. Both prior government battle-deaths and estimated prior government battle-deaths are positively related to the probability of compromise. The results for these absolute measures of costs contrast with the failure of similar measures on the rebel side to predict compromise, and the intensity measures that work on the rebel side fail on the government side. Taken together the results are puzzling. There is no theoretical reason to expect absolute prior costs to matter when the rate of prior costs does not.
Table 5.12 Government Battle-Deaths and the Likelihood of Genuine Compromise (Lower values in cells were generated by using Relogit, given the rarity of Genuine Compromise)

| Variable | Coefficient | Std Error | Z Score | P>|z| | 95% Confidence Interval |
|----------|-------------|-----------|---------|-------|----------------------------|
| Govt Battle-Deaths (10,000s) | -1.167 | .214 | -7.79 | .436 | -.586 | -.253 |
| Constant | -1.762 | .326 | -5.411 | .000 | -2.400 | -1.124 |
| N | 112 | Chisq | 1.55 | Prob Chisq | Pseudo R2 | .02 |
| Prior Govt Battle-Deaths (10,000s) | -0.061 | .147 | -4.13 | .679*** | -.350 | .228 |
| Constant | -1.04 | .375 | -2.778 | .005 | -1.776 | -.307 |
| N | 40 | Chisq | 4b | Prob Chisq | Pseudo R2 | .10 |
| Prior Govt Battle-Deaths (Estimated, 10,000s) | -0.056 | .086 | -6.52 | .514 | -.226 | .113 |
| Constant | -1.599 | .204 | -7.841 | .000 | -1.999 | -1.199 |
| N | 103 | Chisq | 11 | Prob Chisq | Pseudo R2 | .01 |
| Prior Govt Battle-Deaths / Day | -.001 | .004 | -2.14 | .830 | -.009 | .007 |
| Constant | -1.070 | .385 | -2.777 | .005 | -1.826 | -.315 |
| N | 40 | Chisq | .05 | Prob Chisq | Pseudo R2 | .001 |
| Prior Govt Battle-Deaths / Day / Govt Soldier | -123.498 | 152.227 | 397.034 | 269.391 | -3.11 | .565 | .756 | .572 | -.901.671 | .654.674 | 735.771 | .680.224 |
| Constant | -1.050 | .392 | -2.682 | .007 | -1.818 | -.283 |
| N | 40 | Chisq | 11 | Prob Chisq | Pseudo R2 | .003 |

Reported significance statistics use two-tailed tests, asterisks indicate one-tailed t-tests:
* p<.05. ** p<.01. *** p<.001
In order to examine whether these results were due to confounding effects of military intervention, I re-analyzed the data independently for those cases with and without military intervention. In neither case were the unadjusted coefficients significant. I then included the measures of intervention used in Tables 5.9 and 5.10 in a logit analysis of compromise. The uncorrected coefficients for battle-deaths remain insignificant. The corrected coefficients for rebel battle-deaths become slightly more significant when the various measures of intervention are included, but none of the differences are very large. However, the corrected coefficients for government battle-deaths change in several ways, as illustrated by Table 5.13.

Total government battle-deaths, the estimated prior government battle-deaths, and prior government battle-deaths per day per troop remain insignificant if controls for intervention are included. However, the number of prior government battle-deaths per day becomes a significant predictor of compromise when any control for intervention is introduced. Oddly, the absolute level of prior government battle-deaths ceases to be significant when the number of intervenors on each side is included. This measure is not significantly correlated with the number of intervenors on each side, so the loss of significance is odd. It may be an artifact of the small number of cases for which prior government battle-deaths are known, combined with the relative rarity of a high number of intervenors. In any case, the mixed results of government battle-deaths do not appear to be due to confounding effects of intervention.
Table 5.13 Corrected Coefficient and Significance of Government Battle-Death Measures After Controlling For Intervention  
(Values in parentheses are p values from two-tailed tests)

<table>
<thead>
<tr>
<th>Intervention Controls Included in Logit Analysis</th>
<th>Government Battle-Death Measure</th>
<th>Prior</th>
<th>Prior / Day</th>
<th>Prior / Day / Govt Troop</th>
</tr>
</thead>
<tbody>
<tr>
<td>None (Repeated From Table 5.12)</td>
<td></td>
<td>.386***</td>
<td>.067*</td>
<td>.002</td>
</tr>
<tr>
<td>Intervention Exists</td>
<td></td>
<td>.978***</td>
<td>.027</td>
<td>.003</td>
</tr>
<tr>
<td>Pro-Govt. Pro-Rebel</td>
<td></td>
<td>.974***</td>
<td>-.106</td>
<td>.003</td>
</tr>
<tr>
<td>Number Pro-Govt.</td>
<td></td>
<td>.119</td>
<td>-.124</td>
<td>.004</td>
</tr>
<tr>
<td>Number Pro-Rebel</td>
<td></td>
<td>.742</td>
<td>-.439</td>
<td>.111</td>
</tr>
<tr>
<td>Pro-Government Only. Pro-Rebel Only. Both</td>
<td></td>
<td>.765***</td>
<td>-.015</td>
<td>.004*</td>
</tr>
</tbody>
</table>

Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests 
*p< .05, **p< .01, ***p< .001

In an effort to determine if the mixed findings were simply due to the difficulty of separating government and rebel battle-deaths in civil wars, the combined deaths of the two sides were also examined. Table 5.14 presents the results for a number of indicators of intensity. Most coefficients are negative and none are significant. As correction for rare events added nothing to this analysis, corrected estimates are not shown.

The results add little to understanding of battle-deaths and compromise. Perhaps the difficulty is that since similarity of costs is expected to be as important as level of costs in determining whether compromise occurs (see Table 3.3), there is some confounding

106 The Z scores of this variable are, in order of row: 6.467, 7.654, -.329, 8.836. Thus the coefficient is most significant when controls for intervention for the government only, the rebels only, and both sides are included.
relationship between level of costs and the proportion of costs borne by each side. A series of regression analyses of the ratio of casualties (both total battle-deaths and prior battle-deaths) of the two sides using various measures of intensity and total battle-deaths revealed no significant relationship. The evaluation of Hypothesis 4 may provide additional insight by controlling for degree of similarity in battle-deaths.
### Table 5.14 Total Battle-Deaths and the Likelihood of Genuine Compromise

| Variable                        | Coefficient | Std Error | Z Score | P>|z| | 95% Confidence Int |
|---------------------------------|-------------|-----------|---------|-----|-------------------|
| **Battle-Deaths (10,000s)**     | .0003       | .008      | .041    | .968| -.016             | .017             |
| Constant                        | -1.668      | .203      | -8.232  | .000| -2.065            | -1.271           |
| N = 195                         | Chi^2 = 1000.00 | Prob Chi^2 = .000 | Pseudo R^2 = .000 |
| **Prior Battle-Deaths (10,000s)** | -.064       | .136      | -.469   | .639| -.331             | .203             |
| Constant                        | -1.01       | .400      | -2.535  | .011| -1.799            | -.230            |
| N = 41                          | Chi^2 = 8.00 | Prob Chi^2 = 3.78 | Pseudo R^2 = .047 |
| **Prior Battle-Deaths (Estimated, 10,000s)** | -.030       | .045      | -.663   | .507| -.118             | .058             |
| Constant                        | -1.588      | .209      | -7.589  | .000| -1.998            | -1.178           |
| N = 103                         | Chi^2 = 91.90 | Prob Chi^2 = 99.01 | Pseudo R^2 = .007 |
| **Prior Battle-Deaths / Day (Estimated)** | -.003       | .002      | -1.531  | .126| -.006             | .000             |
| Constant                        | -1.411      | .215      | -6.564  | .000| -1.832            | -.990            |
| N = 193                         | Chi^2 = 29.95 | Prob Chi^2 = 008 | Pseudo R^2 = 041 |
| **Prior Battle-Deaths / Day / 10,000 Pop. (Estimated)** | -.044       | .048      | -.913   | .361| -.137             | .050             |
| Constant                        | -1.567      | .205      | -7.628  | .000| -1.970            | -1.164           |
| N = 103                         | Chi^2 = 197.58 | Prob Chi^2 = 1601 | Pseudo R^2 = 012 |
| **Prior Battle-Deaths / Day / Soldier (Estimated)** | -71.111     | 64.434    | -1.104  | .270| -197.400          | 55.178           |
| Constant                        | -1.509      | .212      | -7.120  | .000| -1.924            | -1.093           |
| N = 103                         | Chi^2 = 55.58 | Prob Chi^2 = 150 | Pseudo R^2 = 021 |

Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests:
* p<.05  ** p<.01  *** p<.001
Hypothesis 4: Higher prior joint cost rates increase the probability of compromise, where prior joint cost rates = \(\text{Similarity}_{w} \times (\text{prior rebel cost rate} + \text{prior government cost rate})\)

If the results for each side's battle-deaths are sketchy, then perhaps more insight can be gained from examining cases where both sides' costs increase together. Note that the \(W\) term in Hypothesis 4 is arbitrary: it simply weights the importance of "similarity" against the importance of level of costs. I examine this hypothesis using values of 1, 2, and 3 for \(W\). The results for the first two values are presented in Table 5.15.\(^{107}\) While the coefficients are negative and insignificant, possibly the result of the small number of cases for which "jointness" of battle-deaths is known, correcting for the rarity of Genuine Compromise reveals a number of relationships that appear to disconfirm the null hypothesis. Both joint battle-deaths per day and joint battle-deaths per day per capita are highly significant and positively related to the probability of Genuine Compromise.

\(^{107}\) I omit results for \(W=3\) because at that point, only the rare-events corrected estimates for Joint Battle-Deaths Per Day remained significant.
Table 5.15 Joint Battle-Deaths and the Likelihood of Genuine Compromise (W=1, W=2)

| Variable                          | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|-----------------------------------|-------------|----------------|---------|------|-------------------------|
| Prior Joint Battle-Deaths (10,000s) | .143        | .049           | -1.025  | .305 | .415                    | .130 |
| Constant                          | -.695       | .524           | -1.326  | .185 | -.1722                  | .332 |
|                                   | -.759       | .477           | -1.591  | .112 | -.1693                  | .176 |
| N = 50; W = 1                     | Chi2 2.99   | Prob Chi2      | Pseudo R2 | 089 |

Joint Battle-Deaths / Day

|                    | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|--------------------|-------------|----------------|---------|------|-------------------------|
| Constant           | -.002       | .006           | -.500   | .617 | .016**                  | .007 |
|                    | -.006       | .002           | -.2401  | .016 | .001                    | .010 |
| N = 50; W = 1      | Chi2 .10    | Prob Chi2      | Pseudo R2 | 055 |

Joint Battle-Deaths / Day / 10,000 Population

|                    | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|--------------------|-------------|----------------|---------|------|-------------------------|
| Constant           | -.1125      | .441           | -2.551  | .011 | -1.990                  | .261 |
|                    | -.146       | .416           | -3.407  | .001 | -2.231                  | .601 |
| N = 50; W = 1      | Chi2 4.87   | Prob Chi2      | Pseudo R2 | 015 |

Joint Battle-Deaths / Day / Soldier

|                    | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|--------------------|-------------|----------------|---------|------|-------------------------|
| Constant           | -.270       | .317           | -1.850  | .396 | -.891                  | .352 |
|                    | -.021       | .137           | -.152   | .879 | -.288                  | .247 |
| N = 50; W = 1      | Chi2 1.69   | Prob Chi2      | Pseudo R2 | 052 |

Prior Joint Battle-Deaths (10,000s)

|                    | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|--------------------|-------------|----------------|---------|------|-------------------------|
| Constant           | -.041       | .102           | -.405   | .686 | -.240                  | .158 |
|                    | -.184       | .187           | -.984   | .325 | -.551                  | .183 |
| N = 50; W = 2      | Chi2 2.61   | Prob Chi2      | Pseudo R2 | 080 |

Joint Battle-Deaths / Day

|                    | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|--------------------|-------------|----------------|---------|------|-------------------------|
| Constant           | -.002       | .004           | -.415   | .678 | -.010                  | .006 |
|                    | -.006       | .002           | 3.465   | .001 | .003                   | .010 |
| N = 50; W = 2      | Chi2 2.61   | Prob Chi2      | Pseudo R2 | 080 |

Constant

|                    | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|--------------------|-------------|----------------|---------|------|-------------------------|
| Constant           | -1.127      | .444           | -2.537  | .011 | -1.997                 | .256 |
|                    | -1.185      | .418           | -2.834  | .005 | -2.005                 | .366 |
| Variable                  | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|--------------------------|-------------|----------------|---------|-----|-------------------------|
| N = 30; W = 2            | Chi2 .005   | .011           | -.415   | .078** | -.026 -.013 -.017 -.030 |
| Joint Battle-Deaths / Day / 10,000 Population | .022 | .004 | 5.158 | .000*** | -.247 |
| Constant                 | -1.120      | .446           | -2.514  | .012 | -1.994 -1.247 |
| N = 30; W = 2            | Chi2 .35    | .418           | -2.941  | .003 | -2.050 -1.247 |
| Joint Battle-Deaths / Day / Soldier | .038 | .249 | .402 | .878 | -1.260 -1.056 |
| Constant                 | -0.874      | .489           | -1.786  | .074 | -1.833 -0.63 |
| N = 30; W = 2            | Chi2 .04    | .450           | -2.100  | .036 | -1.826 -0.63 |

Reported significance statistics use two-tailed tests, asterisks indicate one-tailed t-tests.
*p<.05  ** p<.01  *** p<.001

When Expansive Compromise was examined, the results were similar but with some anomalies. While prior joint battle-deaths per day per capita were positive and highly significant under rare-events correction, the absolute level of prior joint battle-deaths was negative and highly significant (p<.00001 in both cases). Moreover, even the coefficient of prior joint battle-deaths per day was negative and significant (p<.003) when W=2.

Genuine Compromise, the measure closest to the CWTG interpretation of compromise, appears to be more likely when war is more intense for the two combatants. However, some form of agreement with concessions of both sides may actually be less common, though the results are quite mixed.

Given the small number of wars for which detailed battle-death estimates are available, these results are tentative. The statistical models used to evaluate these...
hypotheses assume random draws from the true population, yet it is unlikely that the existence of accessible, detailed, battle-death estimates is randomly distributed across civil wars. Table 5.16 summarizes some of the theoretically relevant differences between these two categories of civil war.

**Table 5.16 Civil Wars: Costs Measured vs. Costs Missing**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Battle-Deaths Observed</th>
<th>Battle-Deaths Not Observed</th>
<th>P &gt; t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset Year</td>
<td>1942</td>
<td>1918</td>
<td>.034</td>
</tr>
<tr>
<td>Total Battle-Deaths</td>
<td>131,358</td>
<td>47,512</td>
<td>.066</td>
</tr>
<tr>
<td>Average Duration (Years)</td>
<td>5.9</td>
<td>2.5</td>
<td>.0001</td>
</tr>
<tr>
<td>Force Ratio</td>
<td>.764</td>
<td>.688</td>
<td>.091</td>
</tr>
<tr>
<td>Total Number of Troops</td>
<td>661,406</td>
<td>269,242</td>
<td>.055</td>
</tr>
</tbody>
</table>

There is no significant difference between the mean values of most outcome variables, though it does appear that more historical data is available on longer wars than shorter ones. There is a significant difference between the military balance in those wars which have the most information and those that have the least – from an average 2:1 government advantage when battle-deaths are not measured to 3:1 in those wars with the most detailed information. This difference ceases to be significant when the estimated reliability of force ratio estimates is taken into account, though it remains very nearly so.
Those wars for which comparative battle-death information is available tend to be longer, more recent, involve many more troops, kill more soldiers, and possibly feature greater military superiority by the government than those wars for which such data is difficult to locate. The CWTG predictions regarding compromise have some support, except with regard to the effects of government costs. If there is a silver lining in the fact that we know more about worse wars, it is that those wars to which one can generalize are precisely those in which there is the greatest normative interest.

There is an additional possibility, of course — battle-deaths may be unrelated to the probability of compromise. If there is no relationship, however, the presence of so many significant coefficients is puzzling. While only none of the 24 coefficients of casualty measures in Tables 5.11, 5.12, 5.14, and 5.15 are significant at the .05 level (when chance would predict one or two), re-estimating standard errors to account for the relative rarity of Compromise results in eight such coefficients, most of them significant at the .01 level or greater. The odds that chance alone produced these estimates are therefore very slim, even if one adds in all the tests conducted that do not appear in these tables. Most of these estimates remain significant or insignificant even after controlling for intervention. There does seem to be a connection between battle-deaths and whether civil wars end through compromise. This relationship may be difficult to observe because of errors in the casualty data (as noted in Chapter 4, such data is riddled with errors in even the most modern and well-documented conflicts). or it may be difficult to observe because the relationship that does exist runs contrary to theoretical expectations or is contingent on other unobserved variables. The results are thus suggestive of a
relationship and appear to lend some support to the implications of the CWTG but are too weak and inconsistent to draw any firm conclusions. Better data might go a long way toward resolving these issues.

In sum, the military balance appears to be an important determinant of whether a compromise is reached. When the government holds the advantage, compromise is less likely than when the rebels hold the advantage. There is also some evidence to support the notion that as the intensity of fighting increases, each side has some increased incentive to settle, and that it is when a joint increase in costs occurs that compromise becomes most likely. Intervention does not merely behave as an addition to the side the intervenor joins, but rather internationalizes the war in some manner and increases the probability that it will be resolved through compromise.

5.3 PREDICTING AGREEMENT

Agreement is of less substantive interest than compromise because it encompasses a wide range of outcomes and carries less normative weight – few who support compromise would cheer at a mutual agreement for the unconditional surrender of one side. Having said that, the primary purpose of these tests is to evaluate the success of the theory’s predictions rather than to explore the various forms of formal agreement in detail.
Hypothesis 5: Parity increases the probability of agreement to end the war

Table 5.17 presents the results of a first cut on the role of parity and disparity of force in civil wars.\textsuperscript{108} Because agreement is much more common than compromise, the rare-events corrections are not used when predicting Agreed End. The relationship between parity and the probability of agreement is weak at best. While all coefficients are positive, none are significant. That is, simply measuring in-country strengths of government and rebels armies reveals no support for Hypothesis 5. Prior analysis has shown that intervention has an effect on compromise independent of the number of troops it adds to each side. This being the case, it may be that intervention is really causing the apparent lack of support for the theory.

\textsuperscript{108} Parity is measured as $1 - 2 \cdot |.5 -$Force Ratio$|
### Table 5.17 Logit Analyses of Agreed End With Parity (Weighted)

| Variable                          | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|-----------------------------------|-------------|----------------|---------|-----|-------------------------|
| **Parity**                        | .593        | .485           | 1.222   | .222 | -.358 - 1.545           |
| Constant                          | -.697       | .284           | -2.453  | .014 | -1.254 - -.140         |
|                                   | Chi2 1.50   |                |         | Prob| Chi2 2.20              |
| **Parity (Pre-Intervention)**     | .592        | .470           | 1.260   | .208 | -.329 - 1.513          |
| Constant                          | -.689       | .264           | -2.603  | .009 | -1.208 - -.170         |
|                                   | Chi2 1.60   |                |         | Prob| Chi2 2.00              |
| **Parity (Including Intervenors)**| .726        | .483           | 1.505   | .132 | -.220 - 1.673          |
| Constant                          | -.844       | .278           | -3.038  | .002 | -1.389 - -.300         |
|                                   | Chi2 2.28   |                |         | Prob| Chi2 1.95              |

N=195: Reported significance statistics use two-tailed tests, asterisks indicate one-tailed t-tests: *p<.05, **p<.01, ***p<.001

Intervention may tend to increase Parity, but the effect is quite small – on average, the post-intervention force ratio is only .02 more even than the pre-intervention balance.110 This is the equivalent of moving from Force Ratio = .25 or .75 to Force Ratio = .26 or .74, respectively. Interestingly, rerunning the models separately for those cases in which the time point of analysis is at the beginning of the war and those cases in which the time point is some time into the war found that parity measures were all positive and significant for those cases measured at the beginning but never significant in the other

---

110 Oddly, the unweighted model of Parity Including Intervention performs much better than the weighted model: both the overall model and coefficient of Parity Including Intervention are significant at p<.05 Weighting makes little difference in the other models, though standard errors are slightly larger in the weighted models.
cases. Since many instances of estimates taken at the beginning of the war stem from civil wars that were "born internationalized," this again may be due to intervention's effects. Table 5.18 evaluates the effects of parity on agreement to end the war, controlling for intervention.

Table 5.18 Parity, Intervention for Both Sides, Intervention on One Side Only and Agreed End

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Z Score</th>
<th>P &gt; z</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity (Pre-Intervention)</td>
<td>.214</td>
<td>.504</td>
<td>.425</td>
<td>.671</td>
<td>-.775 to 1.201</td>
</tr>
<tr>
<td>Intervention Govt Only</td>
<td>1.253</td>
<td>.441</td>
<td>2.846</td>
<td>.004</td>
<td>.390 to 2.116</td>
</tr>
<tr>
<td>Intervention Rebels Only</td>
<td>.440</td>
<td>.470</td>
<td>.936</td>
<td>.349</td>
<td>-1.360</td>
</tr>
<tr>
<td>Intervention Both Sides</td>
<td>1.676</td>
<td>.461</td>
<td>2.638</td>
<td>.000</td>
<td>.773 to 2.579</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.014</td>
<td>.297</td>
<td>-3.409</td>
<td>.001</td>
<td>-1.597 to -.431</td>
</tr>
</tbody>
</table>

| Parity (With Intervenors) | .282        | .528           | .535    | .593  | -.752 to 1.317          |
| Intervention Govt Only    | 1.064       | .489           | 2.176   | .030  | .106 to 2.022           |
| Intervention Rebels Only  | .357        | .504           | .708    | .479  | -.631 to 1.346          |
| Intervention Both Sides   | 2.048       | .533           | 3.842   | .000  | 1.003 to 3.093          |
| Constant                  | -1.044      | .298           | -3.498  | .000  | -1.629 to -.459         |

N = 195 Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests:
* p < .05. ** p < .01. *** p < .001

---

That is, in wars that feature military intervention, the average value of the difference between each war's postintervention and pre-intervention measures is .02.
Parity still does not exert a significant effect on the probability of agreement to end the war when intervention is taken into account. It appears that chances for agreement are highest when there is intervention for both sides, for the coefficient of intervention for both is higher than that for intervention for one side only, and highly significant as well. It remains to be seen why intervention has this effect. In an effort to determine the extent to which intervention behaves contrary to theoretical expectations, I performed a logit analysis of Agreed End using Force Ratio and two variables indicating whether the intervention increased or decreased parity.\textsuperscript{111} The results are presented as Table 5.19.

\textbf{Table 5.19 Parity, Intervention Effect on Parity, and Agreed End}

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Z Score</th>
<th>P &gt; z</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity (Pre-Intervention)</td>
<td>.900</td>
<td>.512</td>
<td>1.759</td>
<td>.079</td>
<td>-.103 - 1.903</td>
</tr>
<tr>
<td>Intervention Effect on Parity</td>
<td>1.229</td>
<td>.767</td>
<td>1.602</td>
<td>.109</td>
<td>-.274 - 2.732</td>
</tr>
<tr>
<td>Constant</td>
<td>-.861</td>
<td>.289</td>
<td>-2.978</td>
<td>.003</td>
<td>-1.427 - -.294</td>
</tr>
<tr>
<td></td>
<td>Chi2 4.21</td>
<td>Prob Chi2 122</td>
<td>Pseudo R\textsuperscript{2} .016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parity (Pre-Intervention)</td>
<td>.407</td>
<td>.502</td>
<td>.811</td>
<td>.417</td>
<td>-.576 - 1.391</td>
</tr>
<tr>
<td>Parity Producing Intervention</td>
<td>1.156</td>
<td>.361</td>
<td>3.200</td>
<td>.001</td>
<td>.448 - 1.865</td>
</tr>
<tr>
<td>Disparity Producing Intervention</td>
<td>.984</td>
<td>.417</td>
<td>2.358</td>
<td>.018</td>
<td>.448 - 1.865</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.069</td>
<td>.299</td>
<td>-3.572</td>
<td>.000</td>
<td>-1.656 - -.483</td>
</tr>
<tr>
<td></td>
<td>Chi2 14.55</td>
<td>Prob Chi2 1022</td>
<td>Pseudo R\textsuperscript{2} .056</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{111} Parity-Producing Intervention equals one when Parity (Including Interveners) > Parity (Pre-Intervention) and zero otherwise. Disparity-Producing Intervention is coded one.
Pre-Intervention parity matters when controlling for the intervenor's effect on parity. but ceases to matter when the intervention effect on parity is reduced to two dichotomous variables indicating whether intervention increased or decreased parity. Parity-producing intervention has a somewhat larger coefficient than disparity-producing intervention, though the difference is not significant. Separating cases of intervention from wars that remain domestic does not improve the performance of parity – in fact, it performs "better" in internationalized civil wars.

It is possible that the data is simply flawed and that this accounts for the weak findings. However, the findings were much stronger with regard to Hypothesis 1, and the data for that hypothesis are identical to those used to test Hypothesis 5. After all, Parity is simply a mathematical transformation of Force Ratio. Of course, this only accounts for randomly distributed error. It is possible that systematic bias exists in Force Ratio, which would both account for the findings regarding increases or decreases in the Force Ratio and the non-findings with respect to Parity, which depends on the notion that both sides are equal when they have equal-size armies.

The most obvious form of systematic bias is suggested by the asymmetric nature of civil wars – as noted in Chapter 1, governments are typically better-armed than insurgents. Of course, one might also argue that guerrilla insurgents are hard to track down and kill, requiring more than one government soldier to neutralize a single guerrilla. I examine the possibility that systematic bias of this sort exists in estimates of Force Ratio by weighting the forces of the government relative to those of the rebels when

\[ \text{Parity (Including Intervenors)} < \text{Parity (Pre-Intervention)} \] and zero otherwise.
computing Parity. Instead of computing the force ratio as pro-government troops / all troops. I computed it as \( \frac{(\text{weight} \times \text{government troops}) + \text{pro-government intervenor troops}}{(\text{weight} \times \text{government troops}) + \text{all other troops}} \). In other words, government troops were multiplied by a number first, and then the result was used in place of government troops when calculating the force ratio. This revised estimate of the force ratio was in turn used to compute the overall level of parity.

Figure 5.7 illustrates the change in the Z score for parity in a logit analysis of Agreed End. as well as the change in the overall power of the logit model, given a range of weights from .01 to 10. The Pseudo-R2 is multiplied by ten to magnify changes. If it required, for example, five government troops to counter each rebel troop, then the Z score of Parity should be highest with a weight of .2, while if it required five rebels to equal a single government soldier, these quantities would be highest at a weight of five.
Indeed, Figure 5.7 implies that each government soldier would have to be the equivalent of five other soldiers before Parity would best predict Agreed End. Such a high level of systematic bias seems unlikely — surely government forces are better equipped on average than rebel forces, but this seems too extreme to be simply a difference in quality. It seems more likely that parity simply isn’t a good predictor of Agreed End, contrary to theoretical expectations. Reinforcing this argument is Figure 5.8, which repeats the procedure described above and uses the weighted force ratio to predict Compromise, which worked reasonably well with the current measures.

\footnote{Also examined but not shown are Chi2 levels, log-likelihood, and the coefficient of Force Ratio. These added nothing to the analysis, as Pseudo-R2 is a close approximation of the maxima of Chi2 and log-likelihood in these cases.}
results show that the unweighted estimate of force ratio does fairly well compared to possible alternatives. Force Ratio itself is at its most significant when two government soldiers are the equivalent of three other soldiers, and the logit is also most significant using this weight, but the differences are relatively minor.

**Figure 5.8 Searching For Systematic Bias: Effect of Weighting Systems on Force Ratio Significance and Model Performance**

If parity does not predict Agreed End well in the presence of intervention, there is the possibility that intervention is correlated with parity. I examine the probability of intervention in a civil war using a logit analysis with existence of external military intervention as the dependent variable and the pre-intervention estimate of Parity as the independent variable. Table 5.20 reveals that military parity in civil wars increases the probability of external military intervention, for the coefficient is positive and significant.
Moving from perfect disparity to perfect parity increases the probability of intervention in a civil war by about 19.7%, plus or minus 10.9%, while moving from Parity=.5 (one side holds a 3:1 advantage) to Parity = .67 (one side holds a 2:1 advantage) increases the probability of intervention by about 3.5%, plus or minus 1.9%\(^{113}\). The fact that when analysis is limited to civil wars in which no intervention occurred Parity ceases to be a predictor of agreement implies that what relationship has been detected is largely an artifact of intervention.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Z Score</th>
<th>(p = \cdot z)</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity (Pre-Intervention)</td>
<td>1.041</td>
<td>.474</td>
<td>2.198</td>
<td>.028</td>
<td>.113 - 1.971</td>
</tr>
<tr>
<td>Constant</td>
<td>-.847</td>
<td>.269</td>
<td>-3.151</td>
<td>.002</td>
<td>-1.373 - .320</td>
</tr>
<tr>
<td>(\text{Logit}^2)</td>
<td>2.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(N = 195\) Reported significance statistics use two-tailed tests.

- Hypothesis 6: Higher rates of combined prior costs increase the probability of agreement to end the war.

This hypothesis is straightforward – as the prior costs of a civil war increase, the likelihood that the war ends by agreement increases. Table 5.21 presents a logit model of agreement using measures of prior battle-deaths as the independent variable.

\(^{113}\) Change in mean probability and 95% confidence intervals simulated by Clarify.

\(^{114}\) Oddly, the unweighted model of Parity Including Intervention performs much better than the weighted model: both the overall model and coefficient of Parity Including Intervention are significant at \(p<.05\) Weighting makes little difference in the other models, though standard errors are slightly larger in the weighted models.
| Variable                          | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|----------------------------------|-------------|----------------|---------|------|-------------------------|
| Prior Battle-Deaths (10,000s)    | -0.012      | 0.012          | -0.970  | 0.332 | -0.035 - 0.012          |
| Constant                         | 0.365       | 0.359          | 1.018   | 0.309 | -0.338 - 1.068          |
| N = 41                           | Chisq = 2.63| Prob = 0.105   |         |      | Pseudo R^2 = 0.047      |
| Prior Battle-Deaths / Day        | -0.003      | 0.003          | -1.003  | 0.316 | -0.008 - 0.003          |
| Constant                         | 0.255       | 0.360          | 0.708   | 0.479 | -0.450 - 0.960          |
| N = 37                           | Chisq = 2.44| Prob = 0.148   |         |      | Pseudo R^2 = 0.048      |
| Prior Battle-Deaths / Day / 10,000 Population | -6.696 | 9.816 | -0.682 | 0.495 | -25.935 - 12.542 |
| Constant                         | 1.29        | 0.338          | 0.382   | 0.703 | -0.533 - 0.792          |
| N = 37                           | Chisq = 1.09| Prob = 0.297   |         |      | Pseudo R^2 = 0.021      |
| Prior Battle-Deaths / Day / Soldier | -60.294 | 89.067 | -0.677 | 0.498 | -234.863 - 114.275 |
| Constant                         | 1.28        | 0.343          | 0.373   | 0.709 | -0.544 - 0.801          |
| N = 37                           | Chisq = 0.62| Prob = 0.432   |         |      | Pseudo R^2 = 0.012      |
| Estimated Prior Battle-Deaths (10,000s) | -0.033 | 0.030 | -1.085 | 0.278 | -0.093 - 0.027       |
| Constant                         | -0.387      | 0.158          | -2.447  | 0.014 | -0.698 - 0.077          |
| N = 192                          | Chisq = 2.94| Prob = 0.086   |         |      | Pseudo R^2 = 0.012      |
| Estimated Prior Battle-Deaths / Day (10,000s) | -0.002 | 0.001 | -2.168 | 0.030*| -0.003 - 0.000         |
| Constant                         | -0.191      | 0.186          | -1.029  | 0.304 | -0.555 - 0.173          |
| N = 158                          | Chisq = 11.76| Prob = 0.0006  |         |      | Pseudo R^2 = 0.056      |
| Estimated Prior Battle-Deaths / Day/10,000 Pop | -8.823 | 5.063 | -1.742 | 0.081* | -18.747 - 1.101 |

* indicates significance at the 0.05 level.
| Variable                  | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|---------------------------|-------------|----------------|---------|----|------------------------|
| Constant                  | -0.284      | 0.179          | -1.589  | .112 | -0.634                 | .066 |
| N = 158                   |             |                |         |     |                        |     |
|                           | Chi² = 7.51 | Prob = Chi² = .006 |       |     |                        |     |
| Estimated Prior           | -78.699     | 43.682         | -1.802  | .072 | -164.314               | 6.916 |
| Battle-Deaths / Day /     |             |                |         |     |                        |     |
| Soldier                  |             |                |         |     |                        |     |
| Constant                  | -0.250      | 0.184          | -1.361  | .173 | -0.610                 | .110 |
| N = 158                   |             |                |         |     |                        |     |
|                           | Chi² = 8.59 | Prob = Chi² = .03 |       |     |                        |     |

Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests:
* p<.05, ** p<.01, *** p<.001

The results lend no support to Hypothesis 6. In fact, when estimated prior battle-deaths are used to predict agreement, the result is sufficient to disconfirm Hypothesis 6 – if a relationship exists, it is far more likely to be negative than positive. It is possible that this is due to flaws in the estimation procedure, of course, since so little data on casualties prior to the estimation point is available. However, there is certainly no support for increased costs as a predictor of agreement. Nor does external intervention appear to be the culprit: though coefficients are somewhat less extreme in the cases of nonintervention, they remain negative.

**5.4 PREDICTING WINNER**

Common sense suggests that having a military advantage should translate into a higher probability of military victory. The CWTG suggests a number of very intuitive hypotheses regarding who wins a civil war. While the results of predicting compromise are mixed and those of predicting agreement provided no support for the CWTG, these more intuitive hypotheses generally fare well against the empirical evidence.
• Hypothesis 7: A higher force ratio increases the probability of a government win.

A government can win because it destroys the ability of its opponent to offer further resistance to its allocative choices or it can win because the rebels surrender or accept concessions short of shared control over resources. Table 5.22 examines the effect of force ratio on the probability of a government win. Naturally, the government is more likely to win as it becomes stronger.

**Table 5.22 Logit Analyses of Government Win and Force Ratio**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Z.Score</th>
<th>P &gt; z:</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Force Ratio</strong></td>
<td>2.254</td>
<td>.684</td>
<td>3.297</td>
<td>.001***</td>
<td>.914 3.594</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.386</td>
<td>.495</td>
<td>-2.798</td>
<td>.005</td>
<td>-2.356 -2.415</td>
</tr>
<tr>
<td></td>
<td>Chi² 17.75</td>
<td>Prob 0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pseudo R² 0.44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Force Ratio</strong> (Pre-Intervention)</td>
<td>1.613</td>
<td>.654</td>
<td>2.467</td>
<td>.014**</td>
<td>.331 2.894</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.952</td>
<td>.488</td>
<td>-1.950</td>
<td>.051</td>
<td>-1.908 0.005</td>
</tr>
<tr>
<td></td>
<td>Chi² 6.35</td>
<td>Prob 0.012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pseudo R² 0.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Force Ratio</strong> (Including Intervenors)</td>
<td>2.320</td>
<td>.670</td>
<td>3.460</td>
<td>.001***</td>
<td>1.006 3.634</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.371</td>
<td>.490</td>
<td>-2.795</td>
<td>.005</td>
<td>-2.332 -2.410</td>
</tr>
<tr>
<td></td>
<td>Chi² 12.05</td>
<td>Prob 0.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pseudo R² 0.40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = 195 Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests: * p<.05. ** p<.01. *** p<.001

Figure 5.9 illustrates this relationship, using Clarify to simulate confidence intervals for the probability estimates. This relationship does not take into account the effects of
intervention on a government's chances of victory. Table 5.23 examines the consequences of military intervention for and against the government.

Figure 5.9 Estimated Probability of Government Win With 95% Confidence Intervals
### Table 5.23 Logit Analyses of Government Win, Force Ratio, and Military Intervention

| Variable                  | Coefficient | Standard Error | Z Score | P>|z|  | 95% Confidence Interval |
|---------------------------|-------------|----------------|---------|-----|--------------------------|
| **Force Ratio (Pre-Intervention)** | **1.439**  | **.662**        | **2.174** | **.030** | **1.142** to **2.736** |
| Military Intervention     | -.744       | .302           | -2.465  | .014 | -1.336 to -.153          |
| Constant                  | -.516       | .519           | -.994   | .320 | -1.534 to .501          |
| Chi-sq \(12.40\)          | P>|Chi-sq\(002\) |               |         |     | Pseudo R\(2\) = .04**   |
| **Force Ratio (With Intervenors)** | **2.086**  | **.681**        | **3.065** | **.002*** | **.752** to **3.421** |
| Military Intervention     | -.556       | .322           | -1.726  | .084 | -1.187 to .075          |
| Constant                  | -.1019      | .526           | -1.938  | .053 | -2.050 to .012          |
| Chi-sq \(16.01\)          | P>|Chi-sq\(0013\) |               |         |     | Pseudo R\(2\) = .09**   |
| **Force Ratio (Pre-Intervention)** | **1.701**  | **.692**        | **2.457** | **.014** | **.344** to **3.058** |
| Intervention Govt Only    | .140        | .450           | .311    | .755 | -.741 to 1.022          |
| Intervention Rebels Only  | -.513       | .460           | -1.114  | .265 | -1.415 to .389          |
| Intervention Both Sides   | -2.026      | .535           | -3.789  | .000 | -3.074 to -.978         |
| Constant                  | -.706       | .539           | -1.309  | .190 | -1.764 to .351          |
| Chi-sq \(26.21\)          | P>|Chi-sq\(.0000\) |               |         |     | Pseudo R\(2\) = .09**   |
| **Force Ratio (With Intervenors)** | **2.097**  | **.699**        | **2.999** | **.003*** | **.726** to **3.467** |
| Intervention Govt Only    | -.171       | .499           | -3.343  | .731 | -1.150 to .807          |
| Intervention Rebels Only  | .212        | .509           | .417    | .677 | -.785 to 1.209          |
| Intervention Both Sides   | -1.739      | .566           | -3.071  | .002 | -2.849 to -.629         |
| Constant                  | -1.027      | .539           | -1.907  | .057 | -2.082 to .209          |
| Chi-sq \(25.02\)          | P>|Chi-sq\(.0000\) |               |         |     | Pseudo R\(2\) = .09**   |

\(N = 195\). Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests:

*\(p<.05\)* \(\ast\)* \(p<.01\) \(***\) \(p<.001\)
The results are generally supportive of Hypothesis 7: the coefficient of Force Ratio remains positive and significant even after controlling for the effects of intervention. In general, internationalization of civil wars appears to reduce the chances that the government prevails. In particular, if external intervenors come to the assistance of both sides, the government’s chances of victory are dramatically reduced. While neither coefficient is significantly different from zero, it is still odd that the signs of intervention for government and intervention for rebels are reversed once intervenor troop strength is taken into account.

In order to further examine the degree to which intervention’s effect on the odds that the government wins is independent of troop strength, I analyze the sheer number of troops contributed by intervenors to each side and the resulting change in the military balance. In addition, I test to see if interventions after the war began provide a different effect than those that occur at or before the beginning of the war. To accomplish this, I constructed a measure that simply gives the difference between the post-intervention Force Ratio and the pre-intervention Force Ratio. It therefore measures the number of intervenors in terms of its effect on the relative strength of the combatants. The second measure is simply this difference in those cases where intervention postdates the onset of the war and zero otherwise. Table 5.24 summarizes the results -- simply ignoring intervention that precedes or accompanies war onset actually improves the predictive ability of the logit function, as shown by magnitude of coefficients, significance levels, and Pseudo-R2.
Table 5.24 Logit Analyses of Government Win, Force Ratio, and Intervention Effect on Force Ratio

| Variable                              | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|---------------------------------------|-------------|----------------|---------|-----|------------------------|
| **Force Ratio (Pre-Intervention)**    | 2.128       | .710           | 2.997   | .003** | .736 - 3.520           |
| Intervention Effect on Force Ratio    | 2.33        | 1.080          | 2.165   | .030 | .221 - 4.454           |
| Constant                              | -1.278      | .522           | -2.449  | .014 | -2.301 - -.255         |
|                                       | **Chi² 1150** | **Prob 0.004** | **Pseudo R² .042** |     |                        |
| **Force Ratio (Pre-Intervention)**    | 2.454       | .716           | 3.425   | .001*** | 1.050 - 3.858         |
| Constant                              | -1.381      | .524           | -2.636  | .008 | -2.408 - -.354         |
|                                       | **Chi² 26.55** | **Prob 0.0000010** | **Pseudo R² .099** |     |                        |

N = 195. Reported significance statistics use two-tailed tests. asterisks indicate one-tailed t-tests.
*p < .05. "p < .01. ""p < .001

Returning to the idea of systematic bias in the measurement of force ratio, I examine the overall model performance and Z-score of Force Ratio in a simple bivariate logit predicting probability of government win. While Figure 5.10 has been truncated on the right-hand side to focus on differences in Z scores, the model performance is essentially flat from weights of 3 to 10. A weight of about 2 maximizes the significance of Force Ratio, so that it performs best within the model when a government soldier is worth two rebel soldiers. The differences between this weight and the standard weight of 1 are not spectacular, however, providing further evidence that the force ratio appears to be a reasonable estimate of the relative strength of the parties.
Hypothesis 8: A lower force ratio increases the probability of a rebel win.

I approach this hypothesis with essentially the same analysis as that used for Hypothesis 7. I first examine the role of the different estimates of force ratio, then evaluate the effects of intervention by side and by effect on balance, and finally examine the role that systematic bias in the measurement of force ratio might play in these results. Table 5.25 presents the first results, which are weaker than those for government win. Correcting for the uncommon nature of a rebel win does not substantially alter these results.
Table 5.25 Logit Analyses of Rebel Win and Force Ratio

| Variable                  | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|---------------------------|-------------|----------------|---------|-----|--------------------------|
| Force Ratio               | -.946       | .705           | -1.343  | .179 | -2.327                   | .435 |
| Constant                  | -.399       | .499           | -1.377  | .579 |                          |     |
|                           | Chi2 = 1.79 | Prob = Chi2 = 1.181 |        |     |                          |     |
| Force Ratio (Pre-Intervention) | -.482     | .702           | -6.86   | .493 | -1.858                   | .895 |
| Constant                  | -.709       | .520           | -1.364  | .173 | -1.727                   | .310 |
|                           | Chi2 = 4.75 | Prob = Chi2 = 0.039 |       |     |                          |     |
| Force Ratio (Including Intervenors) | -.627     | .695           | -2.342  | .019**| -2.989                   | -.265 |
| Constant                  | .001        | .488           | .001    | .999 | -0.956                   | .957 |
|                           | Chi2 = 1.05 | Prob = Chi2 = 0.305 |       |     |                          |     |

N = 195 Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests: *p<.05, **p<.01, ***p<.001

Once again the best predictor of victory is Force Ratio, adjusted for the number of troops contributed by intervenors. As Table 5.26 demonstrates, this relationship remains even after controlling for other effects of intervention. These results reinforce those for the probability of government win in that post-onset intervention has a notably stronger effect than intervention that precedes or accompanies onset.
Table 5.26 Logit Analyses of Rebel Win, Force Ratio, and Military Intervention

| Variable                        | Coefficient | Standard Error | Z Score | p>|z|  | 95% Confidence Interval |
|---------------------------------|-------------|----------------|---------|-------|--------------------------|
| **Force Ratio (Pre-Intervention)** | -0.462      | 0.709          | -0.652  | 0.515 | -1.851                   |
| Military Intervention           | 0.071       | 0.334          | 0.213   | 0.831 | -0.584                   |
| Constant                        | -0.752      | 0.559          | -1.345  | 0.179 | -1.849                   |
|                                 | Chi² 54.51  | Prob Chi² < 0.002 | Pseudo R² 0.042 |
| **Force Ratio (With Intervenors)** | -1.780      | 0.714          | -2.492  | 0.013** | -3.180                   |
| Military Intervention           | -0.359      | 0.373          | -0.963  | 0.335 | -1.090                   |
| Constant                        | 0.221       | 0.539          | 0.410   | 0.682 | -0.835                   |
|                                 | Chi² 44.04  | Prob Chi² < 0.002 | Pseudo R² 0.040 |
| **Force Ratio (Pre-Intervention)** | -0.738      | 0.734          | -1.006  | 0.315  | -2.176                   |
| Intervention Govt Only          | -1.209      | 0.673          | -1.797  | 0.072  | -2.528                   |
| Intervention Rebels Only        | 0.264       | 0.496          | 0.532   | 0.595  | -0.709                   |
| Intervention Both Sides          | 0.719       | 0.442          | 1.626   | 0.104  | -1.148                   |
| Constant                        | -0.552      | 0.572          | -0.966  | 0.334  | -1.673                   |
|                                 | Chi² 9.01   | Prob Chi² < 0.002 | Pseudo R² 0.040 |
| **Force Ratio (With Intervenors)** | -1.723      | 0.723          | -2.383  | 0.017*** | -3.14                   |
| Intervention Govt Only          | -0.744      | 0.668          | -1.113  | 0.266  | -2.054                   |
| Intervention Rebels Only        | -0.339      | 0.568          | -0.596  | 0.551  | -1.452                   |
| Intervention Both Sides          | 0.116       | 0.513          | -0.227  | 0.821  | -1.122                   |
| Constant                        | 0.181       | 0.545          | 0.333   | 0.739  | -0.887                   |
|                                 | Chi² 7.10   | Prob Chi² < 0.002 | Pseudo R² 0.052 |
| **Force Ratio (Pre-Intervention)** | -1.113      | 0.749          | -1.485  | 0.138  | -2.581                   |
| Intervention Effect on Force Ratio | -3.303     | 1.208          | -2.735  | 0.006  | -5.670                   |
|                                 | Chi² 13.51  | Prob Chi² < 0.002 | Pseudo R² 0.052 |
| Variable                          | Coefficient | Standard Error | Z Score | p>|z|   | 95% Confidence Interval |
|----------------------------------|-------------|----------------|---------|-------|------------------------|
| Constant                         | -.358       | .541           | -.662   | .508  | -1.420                 | .703 |
| Chi2 = 8.57, Prob = Chi2 = .014  |             |                |         |       |                        |      |
| Force Ratio (Pre-Intervention)   | -1.228      | .742           | -1.655  | .098* | -2.682                 | .226 |
| New Intervention Effect on Force Ratio | -5.303    | 1.438          | -3.688  | .000  | -8.121                 | -2.485 |
| Constant                         | -.340       | .530           | -.754   | .451  | -1.440                 | .640 |
| Chi2 = 15.89, Prob = Chi2 = .0001 |             |                |         |       |                        |      |

N = 195. Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed tests.
* p<.05, ** p<.01, *** p<.001

Figure 5.11 examines the effect that weighting government soldiers would have on these findings. Model performance is never particularly good, and levels off well before a weight of one. The force ratio best predicts rebel victory at a weight of about 1.75, or when 4 government soldiers are the equivalent of 7 other soldiers. When combined with previous analysis of weighting, it does appear that there may be some systematic bias in the measurement of force ratio, with government troops generally being the equivalent of 1.5 to 2 rebel troops. This conclusion is highly speculative, however, since it presumes the truth of the hypotheses being tested. At this point, therefore, the results simply suggest that bias may exist.
Figure 5.11 Searching For Systematic Bias: Effect of Weighting Systems on Force Ratio Significance and Model

- Hypothesis 9: *Parity* increases the probability of *stalemate*.

Stalemate is the rarest of outcomes, occurring in only 5 of the 197 civil wars from 1816 to 1997. Therefore, this analysis is tentative at best. Table 5.27 examines the probability of stalemate given increased military parity. While parity is not significant when intervenor troops are excluded, it does prove to be a significant predictor when intervenor troops are included – but in the opposite direction from that predicted. Parity actually appears to decrease the odds of stalemate when intervenor forces are included.
Controlling for intervention does not alter this finding, nor does controlling for the effect of intervention on parity. Indeed, the relationship appears stronger when the effects of intervention on parity are taken into account, as demonstrated by Table 5.28. As the military strength of the rebels and government becomes more even, the odds of stalemate are reduced. Further, military intervention that increases parity will reduce the odds of stalemate, while military intervention that increases disparity will increase the odds of stalemate. The results are entirely contrary to Hypothesis 9, which, being a directional hypothesis, is actually disconfirmed by these findings.

---

Table 5.27 Logit Analyses of Stalemate With Parity\(^\text{115}\)

| Variable                        | Coefficient | Standard Error | Z Score | \(P>|z|\) | 95% Confidence Interval |
|---------------------------------|-------------|----------------|---------|-----------|-------------------------|
| Parity                          | -1.728      | 1.600          | -1.080  | .280      | -4.865 - 1.409          |
| Constant                        | -2.861      | .714           | -4.005  | .000      | -4.361 - 1.461          |
|                                 | Chi² 1.27   | Prob .259      |         |           | Pseudo R² .026          |
| Parity (Pre-Intervention)       | -1.242      | 1.520          | -.817   | .414      | -4.221 - 1.737          |
| Constant                        | -3.071      | .689           | -4.456  | .000      | -4.422 - 1.720          |
|                                 | Chi² 1.71   | Prob .085      |         |           | Pseudo R² .018          |
| Parity (Including Intervenors)   | -3.854      | 2.087          | -1.847  | .065      | -7.945 - .236           |
| Constant                        | -2.286      | .616           | -3.713  | .000      | -3.493 - 1.079          |
|                                 | Chi² 4.07   | Prob .045      |         |           | Pseudo R² .008          |

\(N = 195\) Reported significance statistics use two-tailed tests. asterisks indicate one-tailed t-tests:

- \(p<.05\)
- \(p<.01\)
- \(p<.001\)

\(^{115}\) Correcting for rare events data does not substantially alter these figures.
| Variable                      | Coefficient | Standard Error | Z Score | $P>|z|$ | 95% Confidence Interval |
|-------------------------------|-------------|----------------|---------|--------|-------------------------|
| Parity (Pre-Intervention)     | -4.002      | 2.368          | -1.690  | .091*  | -8.643 - 6.400          |
| Constant                      | -2.470      | .695           | -3.555  | .000   | -3.832 - 1.108          |
| Chi2                          | 7.360       |                |         |        |                         |
| Prob. Chi2                    |             |                |         |        |                         |
| Pseudo R2                     | 14.9        |                |         |        |                         |

Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests: *p<.01. **p<.01. ***p<.001

As Figure 5.12 demonstrates, bias in the measurement of parity would have to be extreme for the hypotheses to be supported. Once again Pseudo-R2 is multiplied by ten to magnify apparent changes. It is highest – and the Z score is such that parity is most significant – at about .5, or when it takes two government soldiers to equal the military contributions of another soldier. For parity to actually generate effects consistent with Hypothesis 9, each government soldier would have to be the equivalent of eight other soldiers – and even then the model would fall short of significance under the Chi2 test while the coefficient of parity would only barely be significant at the .1 level in a one-tailed test. Again, the number of stalemates is quite small, making these results tentative, but there is no support whatsoever for the notion that systematic bias in parity estimation is responsible for the apparent disconfirmation of Hypothesis 9.

As a final effort to examine this hypothesis, I constructed a series of alternate measures of stalemate defined it as any war which had not been resolved by compromise, government win, or rebel win by an arbitrarily long period of time – these measures of
stalemate thus included not only all cases coded as stalemate but also all civil wars not resolved within 5, 7, or 10 years. None of these measures were predicted by any measure of parity.

Figure 5.12 Searching For Systematic Bias: Effect of Weighting Systems on Parity Significance and Model

- Hypothesis 10: A lower force ratio increases the probability of no winner.

Since the government has the ability to make offers when it expects to lose the war, decreasing the force ratio should not only lead to increased probability of rebel win, but also an increased probability that no one wins.\(^{116}\) Table 5.29 supports this hypothesis: it does appear that as the force ratio increases, the likelihood of no winner decreases, though the relationship is slightly weakened when intervenor troops are included.
Correcting for the fact that no winner is uncommon changes nothing of substance in any of the analyses presented. Therefore, the null hypothesis of no relationship can be rejected.

| Variable                          | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|-----------------------------------|-------------|----------------|---------|-------|-------------------------|
| Force Ratio                       | -2.073      | .771           | -2.689  | .007** | -3.584 - -1.562         |
| Constant                          | -0.036      | .520           | -0.070  | .944  | -1.055 - .982           |
|                                   | Chi2 7.2    | Prob Chi2 0.00 |         |       | Pseudo R2 0.38          |
| Force Ratio (Pre-Intervention)    | -1.789      | .759           | -2.357  | .018** | -3.276 - -0.302         |
| Constant                          | -0.212      | .533           | -0.399  | .690  | -1.257 - .832           |
|                                   | Chi2 5.50   | Prob Chi2 0.00 |         |       | Pseudo R2 0.20          |
| Force Ratio (Including Intervenors)| -1.405      | .750           | -1.873  | .061* | -2.874 - 0.065          |
| Constant                          | -0.499      | 5.24           | -0.954  | .340  | -1.525 - .527           |
|                                   | Chi2 5.45   | Prob Chi2 0.06 |         |       | Pseudo R2 0.18          |

N = 195 Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests: *p<.05. **p<.01. ***p<.001

Controlling for military intervention (Table 5.30) changes little. The pre-intervention force ratio is related to the probability of no winner, but the force ratio including intervenor troops is not. Including the intervenors’ troops actually weakens the effect of force ratio so much that it falls below the threshold of significance. As for the effects of intervention itself, it increases the probability of no winner in general. For example.

\[\text{Of course, one could argue that everybody wins in a compromise. and Zartman (1995) argues that any negotiated agreement is tantamount to victory for the rebels. The phrase}\]
intervention on behalf of the government only in an average civil war (mean value of force ratio) increases the probability that neither side wins by about 13% (though the 95% confidence interval of this estimate is quite large – plus or minus 16%). Intervention on behalf of the rebels may increase the probability of no winner by an average of 6%

though this predicted difference is not statistically significant. If intervenors enter the war for both sides, the probability that neither side wins increase by more than 26%, plus or minus 20%. In short, though the magnitude of the effects of intervention on the probability of no winner are open to doubt, their direction and existence is not.

Intervention increases the probability that no one wins, and their troops appear to play a different role than domestic troops in the decisions of each side.

**Table 5.30 Logit Analyses of No Winner, Force Ratio, and Military Intervention**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Z Score</th>
<th>P &gt; z</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Force Ratio (Pre-Intervention)</strong></td>
<td>-1.593</td>
<td>.786</td>
<td>-2.026</td>
<td>.043</td>
<td>-3.135, -0.52</td>
</tr>
<tr>
<td>Military Intervention</td>
<td>1.088</td>
<td>.384</td>
<td>2.834</td>
<td>.005</td>
<td>0.336, 1.840</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.890</td>
<td>.606</td>
<td>-1.469</td>
<td>.142</td>
<td>-2.077, 0.297</td>
</tr>
<tr>
<td></td>
<td><em>Chi² = 15.84</em></td>
<td>Prob <em>Chi² = .001</em></td>
<td>Pseudo R² = .173</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Force Ratio (With Intervenors)</strong></td>
<td>-0.930</td>
<td>.804</td>
<td>-1.156</td>
<td>.248</td>
<td>-2.506, 0.646</td>
</tr>
<tr>
<td>Military Intervention</td>
<td>1.213</td>
<td>.386</td>
<td>3.145</td>
<td>.002</td>
<td>0.457, 1.969</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.332</td>
<td>.623</td>
<td>0.033</td>
<td>-2.136</td>
<td>-2.553, -0.110</td>
</tr>
<tr>
<td></td>
<td><em>Chi² = 13.84</em></td>
<td>Prob <em>Chi² = .001</em></td>
<td>Pseudo R² = .071</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Force Ratio (Pre-Intervention)</strong></td>
<td>-1.588</td>
<td>.804</td>
<td>-1.974</td>
<td>.048</td>
<td>-3.164, -0.012</td>
</tr>
<tr>
<td>Intervention Govt Only</td>
<td>.929</td>
<td>.519</td>
<td>1.788</td>
<td>.074</td>
<td>-0.089, 1.947</td>
</tr>
<tr>
<td>Intervention Rebels Only</td>
<td>.556</td>
<td>.609</td>
<td>0.914</td>
<td>.361</td>
<td>-0.637, 1.750</td>
</tr>
</tbody>
</table>

"no winner" is a theoretical rather than normative category.
| Variable                                      | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|-----------------------------------------------|-------------|----------------|---------|----------|------------------------|
| Intervention Both Sides                       | 1.591       | .488           | 3.262   | .001     | .635 - 2.547 |
| Constant                                      | -1.893      | .617           | -1.450  | .147     | -2.101 - .314 |
|                                              | Chi² = 16.69 | Prob = Chi² = .002 | Pseudo R² = .088 |             |             |
| Force Ratio (With Intervenors)                | -1.002      | .843           | -1.188  | .235     | -2.654 - .651 |
| Intervention Govt Only                       | 1.035       | .570           | 1.816   | .069     | -0.82 - 2.152 |
| Intervention Rebels Only                     | .180        | .673           | .268    | .789     | -1.138 - 1.498 |
| Intervention Both Sides                       | 2.005       | .501           | 4.003   | .000     | 1.023 - 2.987 |
| Constant                                      | -1.281      | .646           | -1.984  | .047     | -2.571 - .016 |
|                                              | Chi² = 20.90 | Prob = Chi² = .0003 | Pseudo R² = .10 |             |             |
| Force Ratio (Pre-Intervention)               | -1.669      | .805           | -2.072  | .038     | -3.247 - .090 |
| Intervention Effect on Force Ratio            | .582        | 1.321          | .441    | .659     | -2.006 - 3.171 |
| Constant                                      | -.290       | .562           | -.516   | .606     | -1.392 - .812 |
|                                              | Chi² = 5.00 | Prob = Chi² = .058 | Pseudo R² = .10 |             |             |
| Force Ratio (Pre-Intervention)               | -1.976      | .786           | -2.514  | .012**   | -3.516 - .435 |
| New Intervention Effect on Force Ratio        | -1.432      | 1.482          | -.966   | .334     | -4.336 - 1.473 |
| Constant                                      | -.129       | .540           | -.239   | .811     | -1.187 - .929 |
|                                              | Chi² = 6.30 | Prob = Chi² = .041 | Pseudo R² = .154 |             |             |

N = 195. Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed tests:

* p<.05. ** p<.01. *** p<.001.

In order to examine the robustness of the Force Ratio-No Winner connection given the possibility of bias in the force ratio estimate, I examined the relationship between the weight given government troops, the Z score of force ratio, and the overall predictive ability of the model. The relationships are illustrated in Figure 5.13. Oddly, the model
performs best when government troops are essentially ignored in the force ratio, computing it only from rebel troops and the armed forces of intervenors. In this case, the greater the number of pro-government intervenor troops, the greater the chances of no winner. Leaving aside this finding, which serves merely to reinforce the notion of intervenors as distinctly different from pre-existing combatants, I find that the model works best and the force ratio is most significant when four government soldiers are the equivalent of nine other soldiers.

**Figure 5.13** Searching For Systematic Bias: Effect of Weighting Systems on Force Ratio Significance and Model

- **Hypothesis 11**: As the force ratio increases, the probability of rebel win decreases, the probability of no winner decreases, and the probability of government win increases. Hypothesis 11 is unique in that it addresses simultaneous change in dependent variables. I use a multinomial logit analysis to examine this hypothesis. A multinomial logit estimates the relative change in the probability of each outcome as compared to
some base outcome. Given that two of the variables are expected to move in the same
direction relative to the third, I use the third as the base category. What this means is that
there are three possible ways a civil war can end: government win, rebel win, or no
winner. In order to estimate the relative change in these probabilities given changes in
force ratio, it is necessary to compare them to one another. If rebel win is used as the
base category, the expectation is that as force ratio increases, the relative probability of
government win should increase, since both the base category and no winner ought to
become less probable. However, there is no expectation regarding the relative change in
probability of no winner given an increased force ratio. For Hypothesis 11 does not
specify the magnitude of the decrease in no winner as compared to the magnitude of the
decrease in rebel win. Similarly, if no winner is used as the base category, increasing
force ratio should increase the relative probability of government win but there is no
prediction regarding how the relative probability of rebel win may change. Therefore the
final option is used and government win becomes the base category, generating two
expected relative changes in probabilities: rebel win and no winner should both become
less probable as compared to government win when force ratio increases.

Table 5.31 presents the results of multinomial logit analyses of the probabilities of
rebel win and no winner compared to that of government win, using all three measures of
force ratio. The results support Hypothesis 11.\textsuperscript{117} Regardless of which measure of force

\textsuperscript{117} Multinomial logit analyses using the other two outcomes as base categories was also
conducted. In each case, the theoretically expected effect was observed while the effect
for which there was no prediction fell below the threshold of statistical significance.
ratio was used, increasing the relative strength of the government made it more likely to win and less likely for the rebels to win and for there to be no winner.

Table 5.31 Multinomial Logit Models: Comparison to Likelihood of Government Win

| Outcome / Variable | Coefficient | Standard Error | Z Score | P>|z| | 95% Confidence Interval |
|--------------------|-------------|----------------|---------|-------|-------------------------|
| **No Winner**      |             |                |         |       |                         |
| Force Ratio        | -2.782      | .852           | -3.265  | .001***| -4.452 -1.112           |
| Constant           | .869        | .589           | 1.474   | .141  | -.287 2.024             |
| **Rebel Win**      |             |                |         |       |                         |
| Force Ratio        | -1.850      | .789           | -2.344  | .019** | -3.398 -1.304           |
| Constant           | .564        | .571           | .987    | .324  | .555 1.683              |
| [Chi2 Prob Chi2]   | 12.84       | .002           |         |       |                         |
| **No Winner**      |             |                |         |       |                         |
| Force Ratio (Pre-Intervention) | -2.203 | .821 | -2.685 | .007** | -3.812 -.595         |
| Constant           | -.481       | .587           | .820    | .412  | -.669 1.632             |
| **Rebel Win**      |             |                |         |       |                         |
| Force Ratio (Pre-Intervention) | -1.155 | .769 | -1.502 | .133  | -2.661 .352         |
| Constant           | .086        | .577           | .149    | .882  | -1.045 1.216           |
| [Chi2 Prob Chi2]   | 17.4        | .021           |         |       |                         |
| **No Winner**      |             |                |         |       |                         |
| Force Ratio (Including Interventions) | -2.286 | .835 | -2.737 | .006** | -3.923 -.649          |
| Constant           | .512        | .597           | .858    | .391  | -.657 1.682             |
| **Rebel Win**      |             |                |         |       |                         |
| Force Ratio (Including Interventions) | -2.346 | .770 | -3.046 | .002***| -3.856 -.836         |
| Constant           | .820        | .554           | 1.482   | .138  | -.265 1.905             |
| [Chi2 Prob Chi2]   | 13.05       | .002           |         |       |                         |

Reported significance statistics use two-tailed tests. asterisks indicate one-tailed t-tests:
* p<.05. ** p<.01. *** p<.001
Figure 5.14 shows the effects that bias in the estimation of force ratio would have upon the model. Rather than displaying the effects of force ratio on each variable, it simply shows the overall performance of the model. The multinomial model works best when each government soldier is equal to about seven other soldiers, but the differences between a weight of one and a weight of seven, though significant, are not overwhelming. Testing for effects of intervention finds little of note – the force ratio remains significant and negative for both outcomes in every analysis, while intervention dramatically increases the probability of no winner relative to that of government win.\textsuperscript{118} Intervention for both has a stronger effect than intervention for the government alone: intervention for the rebels never has a significant effect. Figure 5.15 illustrates the predicted probabilities of each outcome given changes in the force ratio (including intervenors) – as the government gets stronger, the probabilities of no winner or rebel win decrease while that of government win increases.

\textsuperscript{118} Analysis of the multinomial logit functions using each other outcome as a base category found that intervention increases the probability of no winner relative to that of rebel win, and decreases the probability of rebel win and government win relative to that of no winner. In these cases as well the significance and predicted effect of intervention on behalf of both sides was larger those of intervention on behalf of the government only which in turn were larger than those on behalf of the rebels only.
Figure 5. 14 Searching For Systematic Bias: Effect of Weighting Systems on Model Performance

Figure 5. 15 Predicted Outcome Probabilities By Force Ratio (Including Intervenors)
5.5 QUICK END

- Hypothesis 12: Parity decreases the probability of a quick end to the war.

The final hypothesis examined involves the likelihood that a war ends quickly within one time period. Because the time periods of the CWTG are abstract, it is necessary to examine several possible values of a time period to test this hypothesis. Table 5.32 shows the results of logit analysis of Quick End given time periods of 6, 12, and 18 months.\(^\text{119}\)

<table>
<thead>
<tr>
<th>Table 5.32 Logit Analyses of Quick End With Parity (Weighted)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td><strong>War Ends Within 6 Months After Parity Estimate, Pre-Intervention Estimate, Or Intervention</strong></td>
</tr>
<tr>
<td>Parity</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>Chi²</td>
</tr>
<tr>
<td>Parity (Pre-Intervention)</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>Chi²</td>
</tr>
<tr>
<td>Parity (Including Intervenors)</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>Chi²</td>
</tr>
</tbody>
</table>

\(^\text{119}\) I also examined periods of 1, 2, 3, 24, and 36 months without finding significant relationships.
### War Ends Within 12 Months After Parity Estimate, Pre-Intervention Estimate, Or Intervention

<table>
<thead>
<tr>
<th></th>
<th>.194</th>
<th>.478</th>
<th>.405</th>
<th>.685</th>
<th>-1.130</th>
<th>.743</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity</td>
<td>.367</td>
<td>.276</td>
<td>1.329</td>
<td>.184</td>
<td>-.174</td>
<td>.909</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chi²</td>
<td>.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob &gt; Chi²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parity (Pre-Intervention)</td>
<td>-.130</td>
<td>.459</td>
<td>-.284</td>
<td>.777</td>
<td>-1.031</td>
<td>.770</td>
</tr>
<tr>
<td>Constant</td>
<td>.205</td>
<td>.255</td>
<td>.804</td>
<td>.421</td>
<td>-.295</td>
<td>.704</td>
</tr>
<tr>
<td>Chi²</td>
<td>.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob &gt; Chi²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parity (Including Intervenors)</td>
<td>-.290</td>
<td>.473</td>
<td>-.614</td>
<td>.540</td>
<td>-1.218</td>
<td>.637</td>
</tr>
<tr>
<td>Constant</td>
<td>.514</td>
<td>.268</td>
<td>1.918</td>
<td>.055</td>
<td>-.011</td>
<td>1.040</td>
</tr>
<tr>
<td>Chi²</td>
<td>.38</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob &gt; Chi²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### War Ends Within 18 Months After Parity Estimate, Pre-Intervention Estimate, Or Intervention

<table>
<thead>
<tr>
<th></th>
<th>.120</th>
<th>.492</th>
<th>.243</th>
<th>.808</th>
<th>-1.085</th>
<th>.845</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity</td>
<td>.630</td>
<td>.285</td>
<td>2.211</td>
<td>.027</td>
<td>.071</td>
<td>1.189</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chi²</td>
<td>.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob &gt; Chi²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parity (Pre-Intervention)</td>
<td>-.119</td>
<td>.467</td>
<td>-.254</td>
<td>.800</td>
<td>-1.034</td>
<td>.797</td>
</tr>
<tr>
<td>Constant</td>
<td>.449</td>
<td>.260</td>
<td>1.730</td>
<td>.084</td>
<td>-.060</td>
<td>.958</td>
</tr>
<tr>
<td>Chi²</td>
<td>.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob &gt; Chi²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parity (Including Intervenors)</td>
<td>-.356</td>
<td>.485</td>
<td>-.735</td>
<td>.463</td>
<td>-1.307</td>
<td>.595</td>
</tr>
<tr>
<td>Constant</td>
<td>.756</td>
<td>.277</td>
<td>2.732</td>
<td>.006</td>
<td>.214</td>
<td>1.298</td>
</tr>
<tr>
<td>Chi²</td>
<td>2.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob &gt; Chi²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = 195 Reported significance statistics use two-tailed tests. Asterisks indicate one-tailed t-tests:
* p<.05  ** p<.01  *** p<.001

There is no support for Hypothesis 12 in these findings – although the coefficient of Parity is normally negative, indicating a decrease in the probability of a Quick End, it is never significant. Controlling for intervention does not change the situation. I used each
measure of Parity to predict each measure of Quick End, using each of the combinations of intervention controls in Table 5.13 (existence, side, numbers, and exclusive side of intervention), a total of 36 additional analyses. The coefficient of Parity only reached a significance level of <.2 (<.1 in a one-tailed test) three times, less than one would expect by chance. In each of these cases, the coefficient was positive, opposite the expected direction. The coefficient of intervention, however, was always negative and nearly always significant, indicating that intervention reduces the probability a war ends quickly. Hypothesis 12 is therefore neither supported nor disconfirmed. Although Hypothesis 12 does not predict duration per se, but rather the probability of an end within one time period. I also explored the effect of Parity on war duration by using a Weibull model of hazard rates and failure over time (in this case, war termination). None of the measures of parity were significant in such a model: the variable does not appear to be related to the probability that a war stops in each period of time.

Finally, in order to evaluate the possibility of bias in measurement of parity, I examined the Z score of parity and the Pseudo-R2 of the logit model (multiplied by 100 to maximize visual differences) as different weighting systems were used. Figure 5.16 shows the results: if government troops are ignored, the model performs reasonably well and parity is negatively related to the probability of a quick end. If more reasonable weights are used, a weight of about 3.5, representing the idea that 7 government soldiers are equivalent to 2 rebel soldiers, maximizes the predictive ability of the model and the significance of parity, though the model still falls well short of significance.
5.6 SUMMARY

There are clear patterns to these empirical findings, summarized by Table 5.33. Hypotheses regarding the role of the relative military power of the government are supported while those regarding the degree of parity between the sides or the costs borne by each side are disconfirmed, unsupported, or weakly supported at best.
Table 5.33 Summary of Hypothesis Tests

<table>
<thead>
<tr>
<th>#</th>
<th>Independent Variable</th>
<th>Dependent Variable</th>
<th>Relationship Found (IV $\rightarrow$ DV)</th>
<th>Evaluation of Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Force Ratio</td>
<td>Compromise</td>
<td>Decrease or None</td>
<td>Weakly Supported</td>
</tr>
<tr>
<td>2</td>
<td>Prior Rebel Costs</td>
<td>Compromise</td>
<td>Increase or None</td>
<td>Weakly Supported</td>
</tr>
<tr>
<td>3</td>
<td>Prior Govt Costs</td>
<td>Compromise</td>
<td>None</td>
<td>Unsupported</td>
</tr>
<tr>
<td>4</td>
<td>Prior Joint Costs</td>
<td>Compromise</td>
<td>Increase or None</td>
<td>Weakly Supported</td>
</tr>
<tr>
<td>5</td>
<td>Parity</td>
<td>Agreed End</td>
<td>None</td>
<td>Unsupported</td>
</tr>
<tr>
<td>6</td>
<td>Combined Prior Costs</td>
<td>Agreed End</td>
<td>Decrease</td>
<td>Disconfirmed</td>
</tr>
<tr>
<td>7</td>
<td>Force Ratio</td>
<td>Government Win</td>
<td>Increase</td>
<td>Supported</td>
</tr>
<tr>
<td>8</td>
<td>Force Ratio</td>
<td>Rebel Win</td>
<td>Decrease</td>
<td>Supported</td>
</tr>
<tr>
<td>9</td>
<td>Parity</td>
<td>Stalemate</td>
<td>Decrease</td>
<td>Disconfirmed</td>
</tr>
<tr>
<td>10</td>
<td>Force Ratio</td>
<td>No Winner</td>
<td>Decrease</td>
<td>Supported</td>
</tr>
<tr>
<td>11</td>
<td>Force Ratio</td>
<td>Winner</td>
<td>Decrease Rebel Win. Increase Government Win. Decrease No Winner</td>
<td>Supported</td>
</tr>
<tr>
<td>12</td>
<td>Parity</td>
<td>Quick End</td>
<td>None</td>
<td>Unsupported</td>
</tr>
</tbody>
</table>

Although the relationship between Force Ratio and Compromise is strong.

Hypothesis 1 was specific to extreme values of the force ratio and this relationship received weak support at best. Hypothesis 2, 4, received support only when rare-
events correction was used and were not robust to the effects of intervention. Hypothesis 3 received no support, though there was a relationship between absolute prior costs rather than the rate or prior costs. Hypothesis 5 received support only under one measure of force ratio. support that was not robust to the effects of intervention. Hypotheses 6 and 9 were actually disconfirmed by significant coefficients in the direction opposite that expected, and if Hypothesis 12 was not disconfirmed it certainly was not supported either.

However, Hypotheses 7, 8, 10, and 11 received strong support that was robust to military intervention. The degree of government advantage in quantitative military capabilities strongly affects the outcome of civil wars, and there is suggestive evidence that it may enjoy a qualitative advantage as well. The level of costs probably affects the outcome of civil wars, but results are weak and mixed. More data is clearly required to evaluate the role of costs in civil wars. As for the degree of parity between the armed forces of each side, this proved to be weak and of mixed effects – it appears to moderately increase the likelihood of agreement, but disparity in favor of the rebels increases it even more. It reduces the odds of stalemate, and while it increases the likelihood that a war is brought to an end within 6 months, it does not appear to shorten the average duration of civil wars.

As for military intervention, it dramatically increases the odds of a compromise settlement to a civil war. Though the number of troops committed by an intervenor is an important control variable to improve the accuracy of force ratio estimates, intervention has an effect that extends far beyond the level of force employed. Not
only does compromise become more likely with intervention, but the war is more likely to end by mutual agreement, especially if military intervention occurs on both sides of the civil war. However, civil wars are less likely to be resolved quickly after military intervention, suggesting that for outsiders there may be a choice between finding a compromise solution and stopping the killing quickly. These findings are largely atheoretical and inductive in nature, since the theoretical expectation was that the effect of military intervention would be captured in the number of troops it added to each side.

The empirical findings are intriguing and more study is called for to explore the role of intervention, to refine measures of costs, and to evaluate the possibility of measuring qualitative military differences that appear to play a role in the termination of civil wars. It should be noted that in every statistical model, the Pseudo-R^2 statistic is very low – typically well under .1 – indicating that despite the statistical significance of coefficients, the ability to predict civil war outcomes is only marginally improved by the measures used. There are inherent difficulties with measurement in civil wars, particularly in regard to casualties, and these may be inhibiting overall model performance, but the remarkable consistency of the low reduction in error raises the possibility that important explanatory variables have not been included. Chapter 6 concludes this analysis by attempting to connect the statistical results with those of previous studies, evaluating the CWTG itself in light of these findings, and suggesting modifications to the theory that might help it to address the questions raised by these findings.
Chapter 6

INTEGRATION AND CUMULATION

Prior work has examined the role of military considerations, bargaining over the distribution of resources, and the security dilemma in civil wars. However, no theory includes all three of these components: coercion, bargaining, and expectations about postwar behavior. Furthermore, existing bargaining models of civil war termination assume symmetry between the government and rebels. The CWTG integrates the central elements of civil war and incorporates the asymmetric nature of civil wars. However, questions about the theory are raised by the empirical results. This chapter concludes my analysis by assessing the empirical findings with respect to previous knowledge and assessing the validity and usefulness of the CWTG in order to identify changes that might simplify the model, increase its predictive power, or render it more appropriate for addressing a number of interesting questions.

6.1 INTEGRATION OF EMPIRICAL FINDINGS

Previous work regarding the end of civil wars has also addressed the negotiation-military resolution continuum, who wins, and the duration of civil wars. What role do the traditional realist variables I emphasize – capabilities, costs, and intervention -- play in their findings? In this section I briefly compare my results with existing work and suggest some solutions to empirical puzzles in the literature.
6.1.1 CAPABILITIES

With regard to the issue of power, Mason and Fett's (1996) test of Wittman's (1979) model of war termination found that a civil war is less likely to be settled by negotiation as the size of the government's army increases. Subsequent analysis of the three outcomes of government win, rebel win, and settlement by Mason, Weingarten and Fett (1999) using settlement as the base outcome in a multinomial choice (conditional logit) model found that increases in the size of the government's army as a proportion of the population increased the probability of a government win relative to that of settlement.

The only previous analyses that measured the relative capabilities of the parties to civil wars are two studies by Ayres (2000; 2001). The first of these found that imbalance (disparity) is associated with longer civil wars and separatist victories in civil wars.\textsuperscript{120} Ayres (2001), finds no relationship between relative capabilities (troops, allies, and population) and whether the choice to seek a military solution results in victory for one side or ongoing war. However, it did not examine the question of whether negotiated settlements become more likely than military ones, and therefore did not estimate the effect of capabilities on probability of settlement when compared to military outcomes. Moreover, it appears that the measure of capabilities used was analogous to my Force

\textsuperscript{120} More precisely, Ayres found that there was a negative correlation between the balance of capabilities and conflict length in nationalist conflicts, and that the mean of the balance of capabilities was higher in such wars ending with separation (generally the product of secession) than the mean balance of capabilities in wars ending without separation. Since Ayres measure is continuous from negative values (rebels ahead) to zero (parity) to positive values (government ahead), he also noted that the average figure in wars ending without separation was closer to zero than the average for wars ending in no separation. However, the fact that the average was closer to zero says nothing about parity, for an
Ratio variable rather than my Parity variable, so it did not capture the degree of balance in capabilities but rather which side was ahead.\textsuperscript{121}

This study's results reinforce those of previous work with respect to the probability the government wins—a larger government army relative to the rebels increases the chance it wins. If this study is correct that the government usually outnumbers the rebels and if it is the case that both sides' armies are partly a function of the total population in the state, then this would explain why governments with larger shares of population in their armies' ranks appear to win more often.

I disagree with the rationale for this finding advanced by Mason, Fett, and Weingarten, however, because their argument rests on the assumption that rebels begin a revolt with zero personnel and must work themselves up to a sizeable force while fighting the repressive apparatus of the state. As Table 4.4 regarding measurement of civil wars that were "born internationalized" demonstrated, it is not necessarily the case that rebels begin with a small cadre and then work their way up to a larger force. Sometimes the rebellion begins with a massive revolt by the military or other groups that were organized and armed, but not fighting, prior to the civil war. Sometimes intervenors are already inside the state before war breaks out and can therefore strengthen the rebels.

\textsuperscript{121} Ayres explains that the balance of capabilities is so heavily skewed toward the government (only 14 of 75 cases featured a rebel advantage) that a measure of parity would be highly correlated with the overall balance of forces (Personal communication, April 17, 2001). Correlations between Parity and Force Ratio in my own dataset hover between -.61 and -.68 for different measures of each.
In order to draw a comparison between these stories, I compared the performance of a logit model incorporating per capita size of prewar government army to one including the force ratio. In both cases, the model was significant and the coefficients were significant. However, the model using force ratio was more significant (.0009 to .0404), had a higher Pseudo-R2 (.041 to .029), and found the capability variable to be more significant (.001 to .072). When both are used in the same logit function, Force Ratio remains significant at the .001 level while per capita government troops ceases to be significant. Despite the fact that the correlation between the two is not overly large (.22), lending weight to this reasoning.

With regard to the effect of capabilities on negotiation, this study confirms the findings of earlier work – settlement becomes less likely as the government becomes more powerful relative to the rebels. However, it also suggests an explanation for this in the asymmetric nature of wars and predicts a simultaneous decrease in the probability of a rebel win. In short, this study concurs with and reinforces previous findings with respect to costs, but also offers an explanation for those findings and constructs a more appropriate measure of capabilities with which they can be evaluated.

### 6.1.2 COSTS

Mason and Fett found contradictory results for costs: in one model it significantly increased the probability of settlement while in another it significantly reduced that probability. They found that dropping the variable entirely subtracted little from the predictive power of their statistical model. Ayres (2000) found no relationship between
conflict duration and costs. Mason, Fett, and Weingarten found that as casualty rates increased, the probability of a government win decreased and the probability of a rebel win increased. Mason and Fett argue that sunk costs matter because they cause both sides' expectations about future costs to converge. They found that duration increased the probability of settlement, though Balch-Lindsay and Enterline (2000) demonstrated that the risk of settlement was constant over time, accounting for Mason and Fett's results. Meek (2000) found a statistically significant but substantively minor decrease in war duration from increased yearly casualties while Balch-Lindsay and Enterline (2000) found that higher per-capita battle-deaths per day decreased the duration of wars.

A multinomial logit analysis confirmed Mason, Weingarten and Fett's analysis that as costs as they define them (total battle-deaths per 1,000 people) increase, the probability of a government win decreases, the probability of a rebel win increases (at least in all but the most extreme cases) and the probability of no winner increases. More generally, the theory agrees with them that as costs increase, the probability of a compromise increases. Empirical results support this hypothesis. Contrary to my theory, however, the probability of agreement in general -- even surrender -- also increases. Results for costs are consistently weak across studies, however. Moreover, the results for rates of costs are often weaker than those for aggregate war costs, as in my own tests of Hypothesis 3 regarding the role of government costs. Since a number of scholars (e.g. Gartner and Segura 1998) have suggested that support for war may be a function of cumulative casualties, the fact that absolute measures of cost keep turning up as significant predictors of war outcomes may be an indication of the role that political institutions have to play in
civil wars. Perhaps understanding how the political structure of combatants affects their incentives to fight could improve the ability to predict civil war outcomes while simultaneously incorporating an important element in the war termination literature.

6.1.3 INTERVENTION

As for intervention, Mason and Fett found no significant effect on the probability of settlement. Ayres (2000) found that wars with intervention were longer than those without it. Mason, Weingarten, and Fett (1999) also noted that wars with intervention had a higher average duration. They found that after controlling for duration, intervention actually reduced the probability of settlement, regardless of whether the intervenor was biased or neutral. Meek (2000) found that outside intervention hastened settlements in civil wars that ended in negotiation and either increased or did not affect the time taken to reach a military victory. Balch-Lindsay and Enterline (2000) found that intervention increased the time it took for a military victory in a civil war but did not significantly affect the time it took to reach a negotiated settlement. Finally, Regan (2000) found that total casualties increased the probability of intervention but intensity (casualty rates) decreased that probability. However, because he only measured aggregate costs of the war, his study cannot distinguish between intervention’s causes and its effects. A tentative summary of prior work is thus that as wars progress, they draw in intervention, which in turn tends to promote quicker settlements (possibly) and longer military struggles (probably).
I found a substantial and positive effect for intervention on compromise and other types of agreement, contrary to Mason, Weingarten and Fett. Several explanations for this discrepancy are possible. First, their analysis does not distinguish cases in which an intervenor joins right away and the war drags on from cases where an intervenor joins after many years and the war then ends. Since my analysis measures duration from the time of intervention (or force ratio estimate in cases of nonintervention), it distinguishes between these possibilities. On average, intervenors enter wars at the 22% to 36% mark (40% if wars that are “born internationalized” are excluded), so using the entire duration as a mark of intervention success may obscure what happens after the intervention. If so, it may be mistaken to control for the effects of duration, as the analysis of Balch-Lindsay and Enterline suggests.

Second, their analysis examines the post-1945 period, when civil war duration is at its highest (see Table 5.2): perhaps the relationship of intervention to civil war termination is somehow more difficult to establish during this time period. Of course, other data differences and model estimation choices could account for the discrepancy. The effects of intervention detected in this analysis are quite large, especially when intervention occurs on behalf of both sides. Certainly the relationship of duration, type of ending, and intervention choice remains an empirical puzzle.
6.1.4 SUMMARY

This analysis sheds the most light on whether a civil war is won and by whom. Here it reinforces existing findings, provides a theoretical reason for these findings, and extends them. It also introduces a puzzle - why does intervention on behalf of the government seem to reduce the odds that it wins and increase the odds of compromise, given that the purely military contribution of the intervention should make a government win more likely and a compromise less likely?

The review of literature suggests several answers. Perhaps the government reduces its own effort when the intervenor enters the war. Perhaps the government feels more secure about negotiating with the rebels when it has a protector and potential agreement enforcer. It is also possible that intervenors affect the legitimacy of the rebels, enabling them to bargain more effectively. Perhaps intervenors condition their assistance on negotiation efforts, preferring a divided state to a strong one.

One way to address some of these possibilities would be to construct time-varying measures of the relevant independent variables (number and strength of intervenors, relative military power, casualties) within civil wars. This would not eliminate the possibility that intervenors select particularly easy-to-settle wars, but it would make it easier to identify whether this was the case. It would be particularly useful to examine how the military balance changes over time before and after an intervention, and whether the effect of the second, third, or fourth intervenor was the same as the first.
6.2 ASSESSING THE CIVIL WAR TERMINATION GAME

Having examined both the empirical contributions of this work and the limits on the empirical accuracy of the model, I turn to the original theory itself. What can be learned from this analysis regarding the story I outlined in Chapter 1 and the pre-formal theory with which I began Chapter 2? That bargaining occurs during civil wars is obvious, and it now seems reasonable to model that bargaining process as asymmetric. Both previous findings and those from this study emphasize the importance of the security dilemma in determining whether the sides compromise. Finally, a model of what happens in combat is needed to provide expectations for both sides and to predict features of militarily-terminated civil wars. I will first examine missing components that might be added and then evaluate the usefulness of existing components relative to these potential alternatives.

Five components may be added to this story. First, each side may face institutional constraints. While I am inclined to view institutional differences between rebel movements as fairly similar in basic structure, and while there is similarity in the institutions of governments fighting civil wars, this may be mistaken. It is possible that deeper analysis of rebel groups could establish a system of structures that create different incentives for rebel leaders to pursue war or negotiation. Moreover, if regime type contributes to civil war initiation, there may be important differences among governments fighting civil wars. At a minimum, some type of degradation of capability corresponding to the fractionalization of a side may be appropriate.
Second, perhaps bargaining should continue over time. If the bargaining process of war were modeled as a Rubinstein-type game such as that presented by Wagner (2000), the model would be able to capture the logic of “fight now for a better peace later.” The point would not be to represent the process of negotiation — after all, Rubinstein games generally resolve at the beginning — but rather to represent each side’s expectations about that process in order to better capture decisionmaking. Since the solutions to Rubinstein models are well-known, this may actually render the model easier to solve.

Third, intervenors are strategic actors and their incentives should be modeled. They choose whether to intervene based on conditions of the civil war, which means that intervention is partially endogenous and not simply an exogenous shock that causes the parties to re-evaluate relative power. Perhaps one way to capture part of the effect of intervention while keeping the overall model simple is to allow the interenor to make an offer itself. This could be implemented in a Rubinstein-type bargaining game.

Fourth, since truly neutral guarantors appear to be very rare, the model should allow the defection advantage to vary for each side. In the Sudan case, Ethiopia only offered to guarantee the security of the Anya Nya, not the government. This probably decreased the government’s incentives to defect and perhaps decreased the rebels’ fear of government defection, but it left positive incentives for the rebels to defect unchanged. What Snyder and Jervis (2000) refer to as “predatory” motives could be captured in this manner.

Finally, perhaps the amount of resources available in a period of time should be variable over time rather than fixed. A number of scholars have related economic conditions to the settlement of civil wars, and allowing expectations of the total amount
of resources to be divided to vary would allow modeling of invasions, general destruction, and promises of reconstruction assistance.

Given these possible modifications, how might the model be simplified, or at least not rendered overly complex? The combat models were useful for ensuring that implications of the CWTG did not rest on a particular view of combat, but they also greatly increased complexity. Perhaps the force ratio could be modeled as costs are modeled – each player has some absolute level of capabilities and an expectation about the future rate of increase or decrease. This would allow the model to incorporate the effects of absolute force sizes on, for example, the costs each side expects to suffer. If costs fluctuate in response to the total number of troops fighting a war, then expectations about the K parameters might be modeled as a function of absolute capability levels. This simplification would also allow for expectations that the smaller party will overtake its opponent and win the war. An even more extreme simplification would be to assume that the expected ratio of forces is, on average, identical to the current ratio of forces. Either of these alternatives would make precise mathematical solution of the CWTG much easier.

The modifications made to the CWTG depend on the questions one wishes to answer. Given the surprising findings regarding intervention, I plan to focus the theory on how the absence or presence of military intervention changes the structure of the CWTG. If expectations about combat are modeled by allowing the expected value of the force ratio to equal its current value given a continuation of war, then the utility functions are greatly simplified. Reconstructing the model as a Rubinstein-type bargaining game then
becomes feasible, which allows me to add one or more third parties as strategic actors (especially given that the rebels cannot make offers). Given the direction I plan to take this research, institutional constraints will likely be excluded from this model.

Incorporating a variable for the value of the resources produced in a given round of the game allows intervention in the form of aid to be considered, and modeling the postwar compliance game using a different defection advantage for each side would allow consideration of guarantors. Given the weak support for the cost propositions of this theory, it may be best to simply assume that there is some cost to fighting, which each side expects to remain the same if no intervention occurs. I could thus eliminate the $K$ parameters and simply model cost-imposing intervention as an increase in per-round costs that must be paid.

The result is a revision of the story of civil war termination presented in Chapter 2. Civil wars are waged by organized groups over the allocation of the stream of resources produced with a state. Warfare consists of suffering costs and making offers each round of fighting, and never knowing for sure if one will finally win or lose in the next round. Offers are made by the government and any intervenors, and if accepted an offer triggers a simple compliance game in which the payoffs are determined by the incentive each player has to defect, based on characteristics of the war, the agreement, or the behavior of the intervenors. Intervenors can alter expectations about costs, the advantage to defection for a side, the overall level of resources to be allocated, or the force ratio. Through these four mechanisms, intervenors can alter the course of a civil war. This simple story
extends the dyadic analysis that formed the basis for the CWTG to strategic interaction involving third parties.

6.3 CONCLUSION

While its limitations are clear in terms of how well the hypotheses performed, this study has made several significant contributions to understanding civil war termination. First, this theory has proven useful because it has provided a reason for capabilities and costs to influence civil war termination. Having clear and testable implications is in and of itself a contribution on this question, and this is the only formal model to integrate expectations about war, the process of bargaining, and the security dilemma.

Second, the finding that as the government gets stronger, compromise becomes less likely is a significant increase in knowledge. Although others may have suggested such a relationship, this study was the first to be able to test it using a measure of relative capability. This finding runs contrary to intuition, for one would expect parties who are roughly equal to be most likely to compromise, given that a war fought between equals is likely to prove long and costly. It suggests that being a government is qualitatively different from being a rebel group.

Third, understanding the likely effects of changes in the force ratio has allowed me to demonstrate that military intervention in civil wars has effects that go far beyond simply adding troops to one side. Without a model of how relative military capabilities affect civil war termination in the absence of intervention, this would have been impossible to
establish. This is to me the most interesting finding of the study, and the obvious course for further analysis.

Finally, this project has resulted in the construction of a useful data base for testing propositions about civil wars. While further refinements in the data are certainly necessary, the information presented constitutes an addition to current datasets on civil war, allowing examination of relative capabilities, relative costs, and outcomes short of victory for one side. This holds the promise of further research by others as well as by myself.

To conclude, this analysis has made significant contributions to existing knowledge on civil war termination, despite its weaknesses. The task ahead is to turn the analysis toward the puzzles this study has identified. The long-term goal is to advance understanding of how the disease of war may be “treated” by the international community, which would at least give decision-makers information about what works and what fails to resolve civil wars. Armed with this information, those who seek to end the violence would be in a position to identify the places where third parties can help and the tools most likely to bring peace.
WORKS CITED


Sambanis, Nicholas. 2000b. "Partition As A Solution to Ethnic War: An Empirical Critique of the Theoretical Literature." World Politics 52:.


